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Commercial real estate in Denmark

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The value of the Danish commercial real estate market is large and developments within this market can have widespread implications for the financial system and the real economy. This memo provides an overview of the Danish commercial real estate market. It maps the stock of Danish commercial real estate properties by region, type of property and ownership. It also provides an overview of the business model of commercial real estate companies, focusing on the economic drivers of income and expenses and the principles underlying the valuation of commercial real estate. Lastly, it describes credit institutions' exposure to the commercial real estate sector.

The Danish commercial real estate market is large and concentrated around the Capital Region

The value of the Danish commercial real estate market is estimated to approximately kr. 4,000 billion, corresponding to 140 per cent of the Danish GDP. The market is concentrated around the Capital Region and primarily consists of residential rental properties and offices. Foreign companies own around 19 per cent of Danish commercial real estate companies, while the pension and insurance sector own around 12 per cent. The rest have Danish owners.

Commercial real estate companies are sensitive to changes in rental income and the interest rate level

Commercial real estate companies invest in properties to generate profit through rental income and capital gains. The assets are financed by bank and mortgage debt as well as equity. The income of commercial real estate companies therefore mainly consists of rental income, while their primary costs are interest payments. Commercial real estate companies are therefore sensitive to changes in rental income and interest payments.

Property values have decreased in recent years

The assets of commercial real estate companies are mostly investment properties and changes in property values can lead to large changes in the equity ratio. Commercial real estate values are based on net rental income and investors' required rate of return. This memo introduces a simple indicator for property values based on accounting practices in financial statements. The indicator shows substantial reductions in property values in recent years, driven by rising interest rates.

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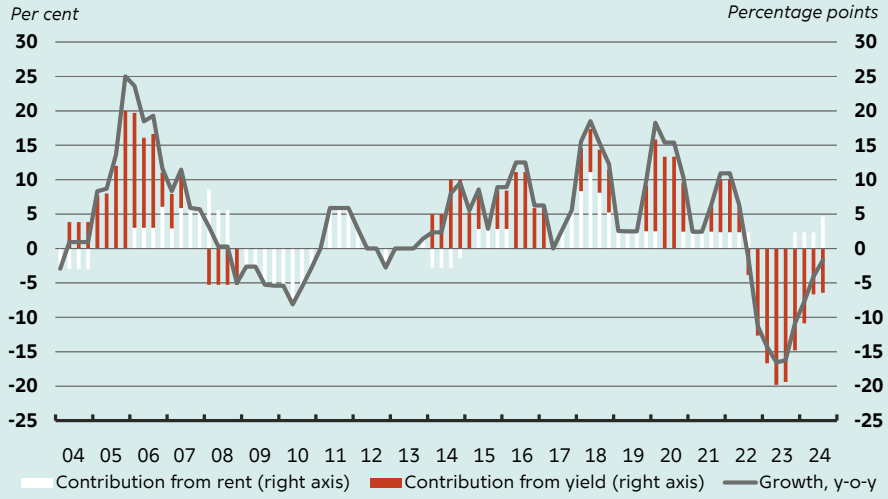
Why is this important?

Commercial real estate is one of the most significant non-financial assets held by companies, and the total value of all Danish commercial real estate is substantial. The significant size of the market and its interconnectedness with both the financial system and the real economy mean that developments within the commercial real estate market can have widespread implications. Historically, the commercial real estate market has been a source of substantial losses for credit institutions, particularly during periods of economic stress. Therefore, the commercial real estate market is an important focus area for financial stability.

Main chart
Property values have decreased in recent years

Growth rates in property value indicator for prime office spaces in Copenhagen



Note: Yearly growth rates in the property value indicator for prime office space in Copenhagen, with an approximate decomposition of contributions from yields and rents.
Source: Own calculations based on data from Colliers.

Keywords

Banking and mortgage credit
Financial stability and financial risks
Households and corporations

01
Introduction

Commercial real estate is one the most significant non-financial assets held by companies, and the total value of all Danish commercial real estate is substantial. The value is estimated to be in the range of kr. 3,500-4,000 billion, which corresponds to 125 – 140 per cent of Denmark's GDP. The significant size of the market and its interconnectedness with both the financial system and the real economy mean that developments within the commercial real estate market can have widespread implications. Historically, the commercial real estate has been a source of substantial losses for credit institutions, particularly during periods of economic stress. Therefore, the commercial real estate market is an important focus area for authorities monitoring and supervising the financial system as well as market participants managing financial risks.

Despite the size and importance of the commercial real estate market, data on it is scarce and fragmented, with limited information on market structure and its key participants. This memo aims to address these gaps by providing a comprehensive overview of the Danish commercial real estate market. Specifically, the memo maps the stock of Danish commercial real estate properties and provides an overview of the business model of commercial real estate companies, focusing on the economic drivers of income and expenses and the principles underlying the valuation of commercial real estate. A simple property value indicator is introduced based on accounting practices in financial statements.

Furthermore, the memo describes credit institutions' exposure to the commercial real estate sector, focusing on the type and geographical location of commercial real estate. The memo draws on various data sources to provide an overview of the Danish commercial real estate market. These include official registers of all Danish properties, companies' financial statements and company group structure information, market data on transactions, yields and rental levels, as well as credit register data on banks' and mortgage credit institutions' exposures to commercial real estate.

There is no universally agreed definition of commercial real estate. Some definitions only include non-residential properties used for commercial purposes such as offices, retail, manufacturing, hotels, etc., while others also include residential rental properties. In this memo, we use a broad definition and define commercial real estate as all property not owned by the household sector or sole proprietors. This includes all real estate owned by companies and the public sector. The public sector is a major owner of real estate in the form of properties used for health care, education, public administration and similar purposes. These properties do not have commercial purposes, but because they can be traded between the public and private sector, a comprehensive description of the commercial real estate market must include the public sector's holding of commercial real estate.

Throughout this paper, we alternate between two definitions of commercial real estate: a broad definition encompassing all commercial real estate not owned by households, as described above, and a narrow definition, focusing specifically on companies whose primary business model involves property ownership aimed at generating rental income and capital gains. These companies are referred to here as *commercial real estate companies (CRE companies).* CRE companies own properties, either residential or non-residential, with the purpose of renting them to tenants (mostly apartment buildings) or companies (office space, retail, hotels, logistic etc.). See box 1 for a discussion of the distinction between types

of companies that own real estate and the statistical definition. Around a third of all commercial real estate is owned by CRE companies. Other types of companies (i.e. *non-CRE companies*) also own commercial real estate, but these properties are generally not owned with the direct aim of producing income in the form of rental income and capital gains. Instead, they are used as inputs for production, e.g. as headquarters or production facilities.[1]

The memo focuses mostly on CRE companies as they tend to drive the market development. In addition, it is primarily loans to the CRE companies that historically have led to losses in credit institutions. However, to understand CRE companies, one must also understand the broader commercial real estate market that they operate in. For instance, it is relatively common for CRE companies to buy or sell properties to or from non-CRE companies. Therefore, some sections of this memo consider the broader definition of commercial real estate. This is especially the case in the analysis of the commercial real estate stock, which includes both the total commercial real estate stock and the subset owned by CRE companies. In other sections, data limitations make it difficult to distinguish between CRE and non-CRE companies.

The memo is structured as follows: Section 2 analyses the stock of commercial real estate to show where it is concentrated, which types of commercial real estate make up the largest part of the market, and which companies and sectors ultimately own the stock of Danish commercial real estate. Section 3 describes the business model of CRE companies, focusing on what drives income and expenses. Section 4 explains how commercial real estate is valued and shows how this can be used to develop a property value indicator for different segments of the commercial real estate market. Finally, section 5 describes credit institutions' exposure to the commercial real estate companies.

[1] Occasionally, non-CRE companies also own and operate income-producing property as a side activity alongside their main businesses. This can range from small-scale operations, such as smaller companies owning one or two rental apartments, to larger enterprises that manage entire apartment buildings in addition to their main economic activities. Importantly, these companies differ from actual CRE companies in that their main economic activity lies elsewhere.

BOX 1

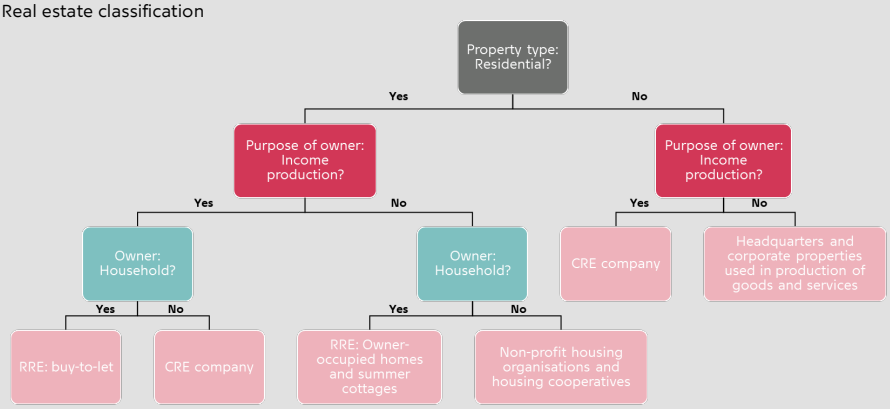
Real estate and company types

CRE companies are companies that own properties, either residential or non-residential, with the purpose of renting them out to generate profit for the owners in the form of rental income and capital gains. The properties are thus income-producing. Other types of companies and organisations also own properties and carry out activities related to real estate, but their business models differ in terms of the use of the property and its economic role.

A distinction between CRE companies and other companies and organisations that own property can be made based on the type of property, the purpose of owning the property, and the type of owner. The illustration below provides an overview of the distinction between different types of entities engaged in real estate activities.[1]

Chart 1A

Real estate classification



Note: The chart is based on the chart 2 in Dierick and Point (2017) and broadly follows the same definitions and classifications.

A property is either residential real estate (RRE) or non-residential real estate (CRE) (first level in chart A). Companies can own both types of properties, but a key distinction in classifying companies as CRE companies is whether the property is income-producing (level two in chart A). Many commercial properties are owned by companies with the purpose of using them in the production of goods and services, e.g. as headquarters or industrial facilities, not for income production in the form of rent. Companies whose main activity is not renting out these properties are not classified as CRE companies. Finally, a distinction can be made between whether a property is owned by a household or not (third level in chart A). Income-producing properties owned by private households fall within the buy-to-let segment, i.e. private individuals who own smaller apartment buildings or multi-family houses, and act as landlords. As buy-to-let activities are often undertaken by non-professional landlords on a part-time basis, households that let out properties are not considered CRE companies.

Residential real estate that are not income-producing fall into two separate categories in chart A. The first is owner-occupied housing and summer homes. The second is non-profit housing organisations and housing cooperatives (*almene boligselskaber* and *andelsboligerforeninger* in Danish). Non-profit housing organisations and housing cooperatives are not considered CRE companies as they are not income-producing. Non-profit housing organisations are subsidised by the local municipality or region together with the state, and rents are set to cover only costs and not to gain profit. Housing cooperatives are associations whose purpose is to own and operate a property on a cooperative basis, and the members of the housing cooperative own a share of the property and have the right of use to a home in the property. Housing cooperatives do not aim to gain income through rents, and thus are not income-producing.

In addition to the classification of ownership of properties in chart A, construction of commercial or residential real estate with the aim of future sale of the finished properties is also a part of the business model of some CRE companies, as construction of properties for sale is an income-producing activity. In this memo, we will mostly consider CRE companies whose main purpose is renting out properties, not building them. However, many CRE companies engage in both activities, making clear distinctions difficult.

Statistical definitions of CRE companies

CRE companies are classified in the Danish industry codes (DB07) under Real Estate Activities. CRE companies in the DB07 definition are comprised of three subgroups under real estate activities (industry codes in parenthesis):

- Buying and selling of own real estate (681000)
- Renting of non-residential properties (682040)
- Other renting of residential properties (682030)

However, as discussed above, real estate activities in the Danish industry codes also include other types of companies that are not considered CRE companies. Non-profit housing organisations are registered under the industry code 682010, and housing cooperatives under 682020. Real estate agencies (683100) and companies that manage real estate on a fee or contract basis (682010) are not considered CRE companies either, as they do not own or rent out income-producing properties, but rather carry out activities related to real estate, such as renting out or managing third parties' properties.

Before 2007, Danish industry codes followed different classifications (DB03 and DB93). In these versions, the industry codes for buying and selling of own real estate was 701200, renting of non-residential properties was 702040, and other renting of residential properties was 702030.

[1] The illustration of real estate classification broadly follows the recommendation of the European Systemic Risk Board (ESRB) on closing data gaps in the real estate sector, see Dierick and Point (2017).

02
The Danish commercial real estate market

The value of the Danish commercial real estate market is large and consists of a heterogenous variety of properties owned by both domestic and foreign companies. This section describes the Danish commercial real estate market, both in terms of the stock of commercial real estate properties, the transaction market, and which companies and sectors that ultimately own the stock of Danish commercial real estate.

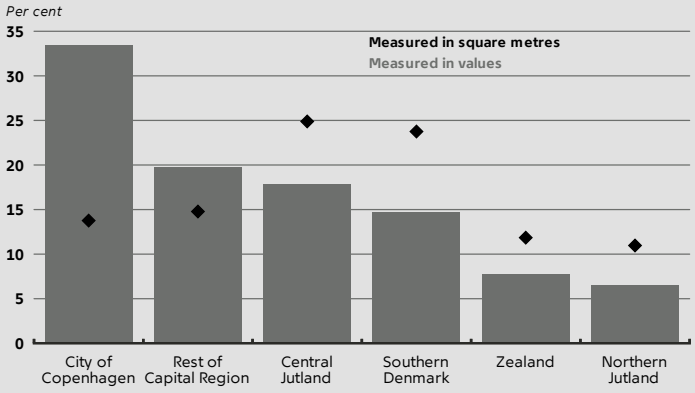
The commercial real estate stock by region, industry, and property type

We map the stock of Danish commercial real estate by combining data from the Land Registry (*Tingbogen*), the Central Register of Buildings and Dwellings (BBR), the Central Business Register (CVR), and companies' financial statements. We measure the stock in both square metres and values. Our findings indicate that there are at least 300 million square metres of commercial real estate in Denmark, with an estimated value of roughly kr. 3,500-4,000 billion. In comparison, the value of real estate owned by the household sector is roughly kr. 4,600 billion. For a further description of the mapping and the underlying assumptions, see box 2.

CHART 1

Danish commercial real estate by region

Measured by square metres and book values

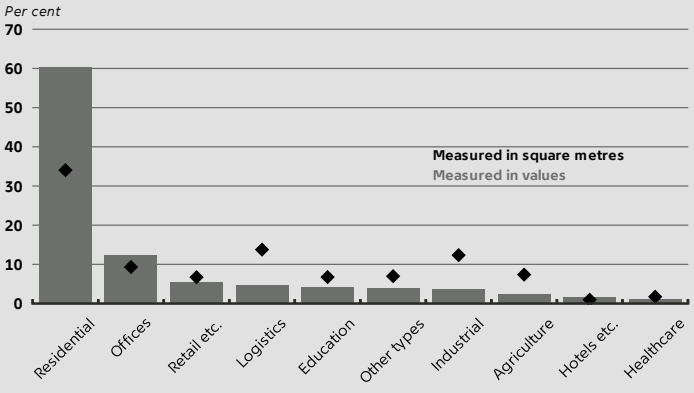


Note: Danish commercial real estate by region measured by square metres (black dots) and book values (grey bars). Bornholm municipality is included in Copenhagen environs. Based on entries in the general registers as of 31/10/2024 and the latest available financial statements. For further details, see box 2.
Source: The Land Registry, the Central Register of Buildings and Dwellings and Bisnode

CHART 2

Danish commercial real estate by property type

Measured by square metres and book values



Note: Danish commercial real estate by property type measured by square metres (black dots) and book values (grey bars). Other types include properties used for daycare, defence, police, holiday homes, sports and culture. Based on entries in the general registers as of 31/10/2024 and the latest available financial statements. For further details, see box 2.
Source: The Land Registry, the Central Register of Buildings and Dwellings and Bisnode

The City of Copenhagen and the rest of the Capital Region hold the largest share of commercial real estate, accounting for 29 per cent of the total square metres,

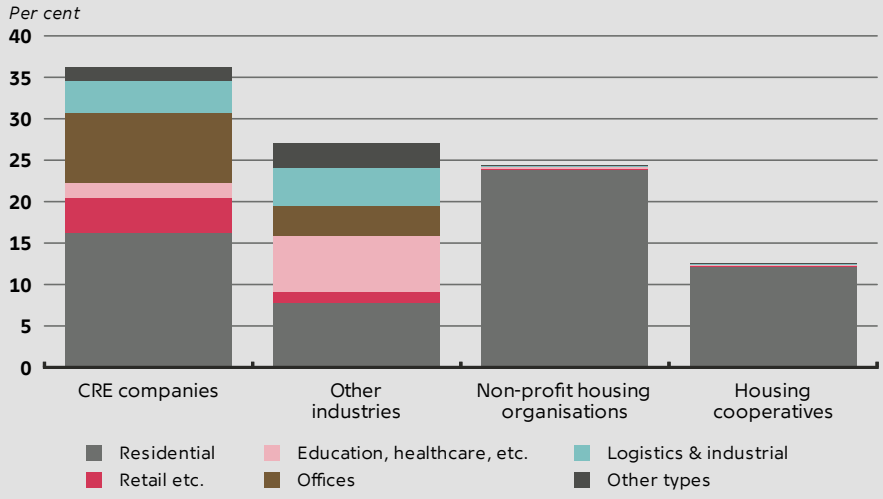
as shown in chart 1. Central Jutland and Southern Denmark each hold about 24-25 per cent of the stock, while Zealand and Northern Jutland account for around 11-12 per cent each. Approximately a third of all commercial real estate is residential, while the rest is used for business purposes such as logistics, production facilities, offices, retail, agriculture, and public administration, see chart 2. Logistics and industrial production buildings in particular make up a large share of the stock measured in square metres, reflecting the large size of these properties.

When measured by book value, the distribution differs significantly. Around 33 per cent of the book value of all commercial real estate is concentrated in the City of Copenhagen and close to 20 per cent is located in the rest of the Capital Region. Central and Southern Denmark account for 15-18 per cent each, while Zealand and Northern Denmark each account for around 6-8 per cent. Similarly, commercial real estate used as residential rental units make up close to 60 per cent of the total value, while making up just 34 per cent of total square metres. Office buildings also represent a substantial portion of the total value, whereas buildings used for logistics and production make up a much smaller share in terms of value compared to their representation in square metres. These differences between the distributions in square metres and values reflect significant variation in square metre prices between various property types and locations, as well as differences in the composition of property types across regions. Generally, the Capital Region and other urban areas have a larger concentration of commercial real estate used for residential, office, and retail purposes, while more rural areas tend to have a larger share of logistics, industrial and agricultural properties.

CHART 3

Danish commercial real estate by industry of owner and property type

Measured by book value



Note: Danish commercial real estate by industry of direct owner and property type, measured by value. The distinction between CRE companies, non-profit housing organisations and housing cooperatives is based on industry codes as explained in box 1. "Other industries" covers all other industry codes and includes companies that are ultimately owned by the public sector. "Other types" include properties used for agriculture, holiday homes and hotels. Based on entries in the general registers as of 31-10-2024 and the latest available financial statements. For further details, see box 2.

Source: The Land Registry, the Central Register of Buildings and Dwellings and Bisnode

CRE companies are the largest commercial real estate owners, accounting for around 35 per cent of the total value of the commercial real estate market, see chart 3. Their holdings consist primarily of buildings used as dwellings and offices, and to some extent also buildings used for retail, logistic and industrial purposes. Non-profit housing organisations (*almene boligselskaber* in Danish) own almost 25 per cent of the value of the stock, while housing cooperatives (*andelsboligforeninger* in Danish) own approximately 12 per cent.[2] Both non-profit housing organisations and housing cooperatives almost exclusively own buildings used as dwellings. The remaining part is owned by other types of companies. This part is comprised by a broad combination of different types of companies and properties. A substantial portion consists of properties used for education, healthcare, day care facilities, police and defence, which tend to be owned by the public sector. Another large part is properties used as headquarters or production facilities, which are owned by the users themselves. Lastly, there is also a substantial number of buildings used as dwellings that are owned by companies not classified as CRE companies.

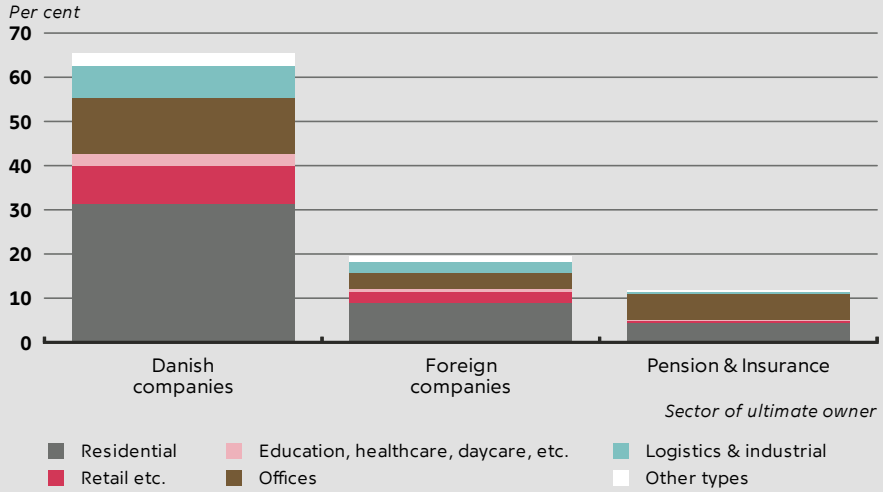
Ultimate ownership of Danish CRE companies

Companies are often part of a group structure where several individual companies are owned by a parent company. This is particularly true for CRE companies. In order to assess who ultimately owns the Danish CRE companies, we therefore map each subsidiary CRE company according to the sector of the ultimate parent company.

CHART 4

Ownership of CRE companies by ultimate owner and property type

Measured by book value



Note: Danish commercial real estate by type of ultimate owner and property type measured by book value. Delimited to commercial real estate directly owned by CRE companies. Public and NPISH ultimate owners are excluded as they only own a negligible part of the CRE companies. "Other types" includes properties used for agriculture, holiday homes and hotels. Based on entries in the general registers as of 31/10/2024 and the latest available financial statements. For further details, see box 2.

Source: The Land Registry, the Central Register of Buildings and Dwellings, Bisnode and the Central Business Register (CVR).

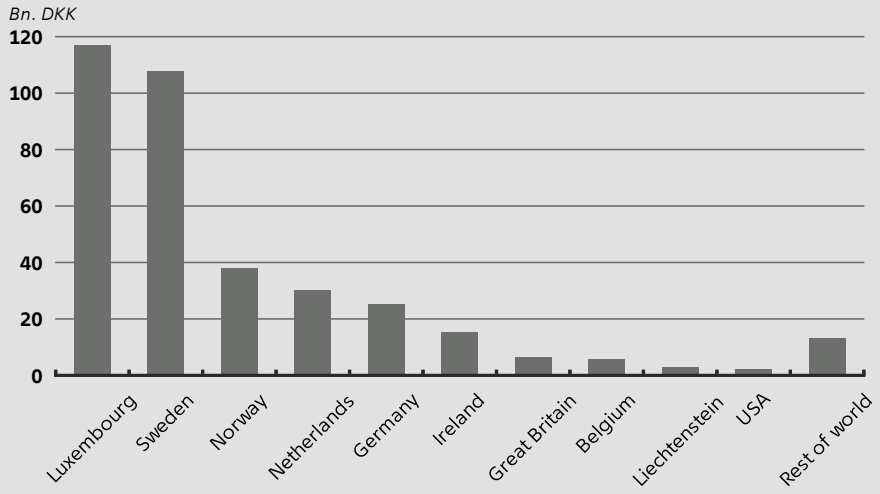
[2] Property values of non-profit housing organisations and housing cooperatives are based on imputed square metre prices, as financial statements are generally not available for these organisations, see box 2.

Around 65 per cent of the value of Danish CRE companies is ultimately owned by Danish companies, 19 per cent is owned by foreign companies, and 12 per cent is owned by pension funds and insurance companies, see chart 4.[3] Foreign companies generally own a diverse portfolio of commercial real estate, while the pension and insurance sector primarily owns buildings used for residential purposes and offices, see chart 5. In some cases, commercial real estate is owned through investment funds that invest in CRE companies on behalf of their investors. Such investment funds are categorized as Danish companies in the categorization below, meaning that the ownership shares of foreign companies and pension and insurance companies is potentially underestimated to the extent that they also invest in commercial real estate through investment funds. However, the potential underestimation is limited as Danish investment funds that focus on commercial estate as their primary investment strategy/asset class account for only a limited share of the Danish commercial real estate market. In 2022, assets under management for these investment funds amounted to kr. 86 billion.[4]

CHART 5

Foreign ownership by country

Measured by book value



Note: Danish commercial real estate owned by foreign companies by country of foreign owner, measured by book value. The foreign owner is the first foreign owner, which can potentially be a subsidiary of a company from another country. Based on entries in the general registers as of 31/10/2024 and the latest available financial statements. For further details, see box 2.
Source: The Land Registry, the Central Register of Buildings and Dwellings, Bisnode and the Central Business Register (CVR).

The foreign owners of Danish commercial real estate are, initially, primarily registered in Sweden and Luxembourg, see chart 5. The Swedish owners tend to be large CRE companies whose activities span multiple countries while the owners registered in Luxembourg are mainly a combination of holding companies and

[3] Pension funds and insurance companies also have indirect ownership of commercial real estate through investments in commercial real estate companies below the cutoffs for company group inclusion and through funds that invest in commercial real estate. These are not included under *Pension & Insurance* in chart 4. Some pension funds and insurance companies are ultimately owned by banks, labour unions, or holding companies, but are included under *Pension & Insurance* in Chart 4.
[4] Danish Financial Supervisory Authority (2023).

investment funds. A substantial part is owned by Norwegian companies, and to some extent also companies from the Netherlands, Germany and Ireland. Note that it is only possible to identify the first foreign owner, which could be a subsidiary of a company from a different country. This is likely the case for many foreign owners registered in Luxembourg, while the owners from Sweden, Norway etc. are more likely to have their ultimate ownership based within those countries.

BOX 2

Measuring the commercial real estate stock

We combine data from the Land Registry (*Tingbogen*), the Central Register of Buildings and Dwellings (BBR), the Central Business Register (CVR) and companies' financial statements to construct a property level register of the stock of commercial real estate in Denmark. The final register contains information on property location, type, direct and ultimate ownership, size, and value. It only contains properties owned by companies and the public sector. Properties owned by households and self-employed people are excluded.

The starting point is the Land Registry. From this register, we extract all properties that are registered by a company (i.e. owned by a CVR number). This includes properties owned by the public sector. Through the BFE register (*Bestemt Fast Ejendomsnummer*) we merge information on building size and type from the Central Register of Buildings and Dwellings. Finally, we add information from the Central Business Register on the industry of the direct owner plus information on the ultimate owner.[1]

We derive information on the value of properties from the financial statements of the direct owners. Specifically, we use balance sheet data on the value of land and buildings. Note that in many cases a single company owns several different types of properties located in different regions. Further, for several properties, there is no financial statement available for the direct owner. This is particularly challenging for properties owned by the public sector, non-profit housing and housing cooperatives.

In order to 1) split the company-level value of "land and buildings" by property type and region and 2) impute values for properties where there is no accounting data available, we estimate square metre prices across geographic regions and property types. We do this by using the subsample of companies registered as CRE companies as these companies are expected to have the most accurate valuation of their properties.[2] We then estimate square metre prices in an iterative process. In the first step, we further restrict the subsample to companies that own properties within the same geographic region and of the same type. Based on these properties of similar type and geography, we estimate an initial set of square metre prices as the median square metre price within each region/type group. We then join these square metre prices to the broader set of properties owned by CRE companies and calculate imputed property values. These imputed values are then summed at the company level and compared to the values in the financial statements. If these differ, the imputed values are scaled accordingly, and a new set of square metre prices are then calculated based on these scaled imputed values. We use these square metre prices to 1) split the company-level value of "land and buildings" from the annual reports and 2) impute the value for those buildings that are owned by companies with no annual reports. When we split company-level value, we once again calibrate square metre prices to ensure that the final value at the company-level is equal to the value listed in the financial statements whenever this is available. Using this method, we estimate the value of the total stock to approximately kr. 4,000 billion. If we skip the final calibration step and instead rely on the imputed square metre prices, we estimate the total value to approximately kr. 3,500 billion.

Estimating the stock of commercial real estate is not a trivial process, and the resulting figures should be interpreted with some caution. 2.5 per cent of the properties from the Land Registry cannot be matched in the Central Register of Buildings and Dwellings (BBR). These properties are excluded from the data. Additionally, properties owned by sole proprietors are often registered in the Land Registry with the owner's personal identification number (CPR). These properties are excluded as we only include properties owned by a CVR number. Both exclusions mean that we are potentially underestimating the size of the Danish commercial real estate stock. Further, the exclusion of properties owned by sole proprietors also means that we are likely underestimating the share of agricultural commercial real estate, as the share of sole proprietors is relatively high in this sector. Measuring the value of the commercial real estate properties is also subject to some degree of uncertainty. The financial statements on the value of "land and buildings" can sometimes be misleading, as they might 1) include more than just the buildings, such as land or buildings that are excluded in the first step and 2) in some cases be measured at cost price, which, depending on the time of purchase, can differ substantially from the market value.

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Despite these caveats, the output of the stock mapping is sensible. Figure 2A aggregates the total value of commercial real estate by industry and compares it to the total value of mortgage loans in the same industry. As expected, we find a close correlation, with the vast majority of the industries lying below the 45-degree line, indicating (as one would expect) that mortgage loans are generally lower than the value of the properties.

Chart 2A

Total property value compared to total mortgage credit by industry

Note: Industry level total sum of mortgage debt plotted against industry level total sum of property value. Both series are log-transformed. Red dots indicate commercial real estate industries, i.e., industry codes 681000, 682030 and 682040.
Source: The Land Registry, the Central Register of Buildings and Dwellings, Bisnode, the Central Business Register (CVR) and Danmarks Nationalbank.

[1] A company is defined as owning another company if it holds more than 50 per cent of the voting right over the subsidiary company. Several pension and insurance companies are ultimately owned by other companies, but these ownership links are ignored in order to assess the pension and insurance sector's role in the commercial real estate market.
[2] Land and buildings are typically carried at either the historical cost or at fair value in financial statements. Cost price reflects the initial purchase/construction price. Fair value reflects current market values. CRE companies usually report their holdings of land and buildings at fair values.

Size of CRE companies

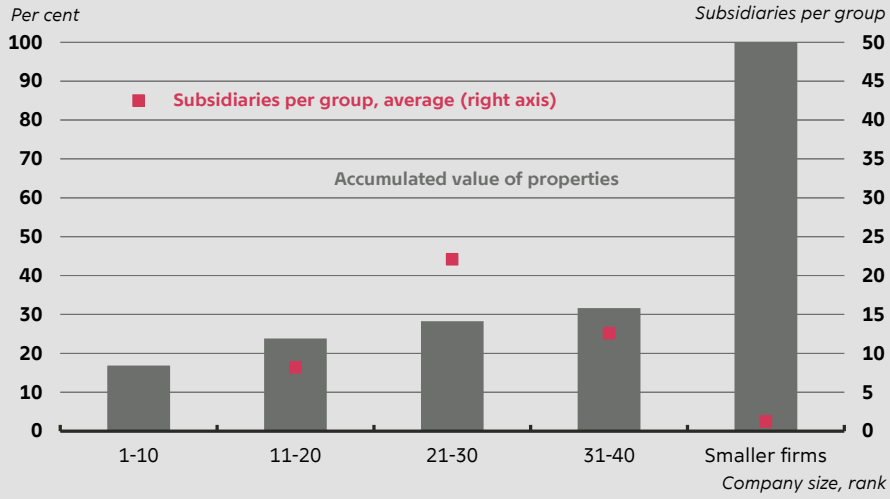
CRE companies vary considerably in size. The market is characterised by a smaller number of very large companies that have large holdings of commercial real estate and a large number of small companies. The 10 largest companies account for just under a fifth (17 per cent) of the total value of income-producing properties, see chart 6. The 40 largest companies account for a third of the value, and the rest is divided between 27,000 companies. Foreign owned companies and companies owned by the pension and insurance sector are on average larger than other CRE companies and account for over half of the largest (top 40) companies' holdings of commercial real estate. For the smaller companies, foreign owned companies and companies owned by the pension and insurance sector account for just over a fifth of these companies' holdings of commercial real estate.

The largest commercial real estate companies are often structured as groups with several subsidiary companies in a group. It is not unusual for large companies to establish a subsidiary company for each property they own, resulting in groups with a very large number of subsidiaries. On average, the 10 largest groups consist of a parent company with 40 subsidiaries (chart 6, right axis). The smaller companies are typically individual companies (i.e. not a group) or a single company owned by a holding company. A reason for structuring commercial real estate companies as groups with subsidiaries, is that the business model involves the buying and selling of properties. The largest property transactions are typically structured as a share deals, where properties are traded by transferring ownership of the subsidiary holding the property instead of the property itself, see also next section.

CHART 6

Value of commercial real estate by company size

Accumulated value of properties by size of companies and average group size



Note: Left axis: Accumulated value of lands and buildings of Danish CRE companies ranked by company size in per cent of total value of lands and buildings in financial statements. Companies are consolidated at the group level. Right axis: average number of companies (CVR numbers) in a group.
Source: Bisnode, Experian and own calculations.

Transactions of commercial real estate

Commercial real estate transaction volumes increased between 2013 and 2017, supported by stable economic growth, rising employment and falling interest rate levels, see chart 7. Between 2018 and 2020, transaction volumes varied between kr. 60 and 80 billion per year. Transaction volumes peaked in 2021, to some extent driven by further reductions in the required rate of return of investors. This development mirrors the housing market, which also saw a large number of transactions in 2021. The developments of transactions in the past 10 years are similar to the developments in other Nordic countries.

Residential real estate makes up the largest share of transactions, and together with offices accounts for over half of commercial real estate transactions in all years from 2013 to 2023. Foreign investors were very active in the Danish commercial real estate market from 2016-2022, accounting for over 40 per cent of total transaction volumes in this period, see chart 8. This is also reflected in the

share of income-producing properties owned by foreign companies, which has doubled from 10 per cent in 2015 to 21 per cent in 2023. However, the share of commercial real estate purchased by foreign investors dropped significantly in 2023, as rising interest rates and yield requirements pushed down prices, which reduced the transaction level significantly.

Transactions of commercial real estate are made as asset deals or share deals. An asset deal involves trading the property itself, while a share deal involves trading the company that owns one or more properties. Most transactions are made as asset deals. In 2019-2023 almost 90 per cent of commercial real estate transactions were made as asset deals. However, transactions involving larger properties are typically made as share deals. Share deals accounted for almost half of the transaction values in the same period.

One reason for structuring transactions of commercial real estate as share deals versus asset deals, is tax incentives. When commercial real estate is being traded as an asset deal, the new owner must pay a registration fee to the Land Registry of 0.6 per cent of the purchase price plus a fixed fee of kr. 1,850. For transactions of large properties, the expenses for the buyer can thus be sizeable. Additionally, the seller must pay tax on the property if the trading price of the property exceeds its tax value (purchase price + improvements - depreciation). These costs can also be sizeable if the property has been renovated or if there have been value adjustments due to interest rate changes, or simply if the seller has owned the property for an extended period, as prices tend to rise over time.[5]

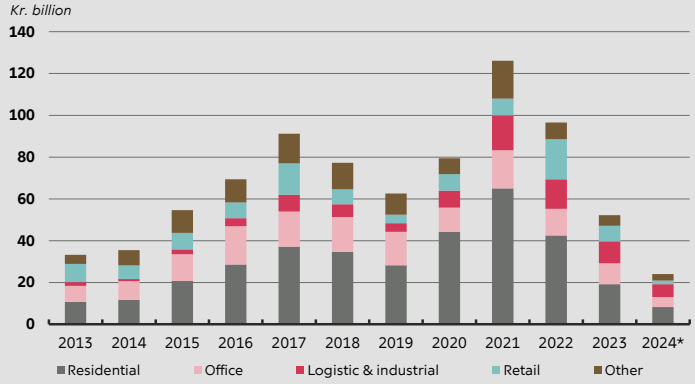
When a property is sold as a share deal, the entire company owning the property is transferred to the buyer, including all assets and liabilities. There is no registration fee, and the tax on the property's appreciation can be deferred, as the buyer assumes the deferred tax liability. Corporate tax payments on property appreciations can theoretically be deferred indefinitely as long as the property is owned and traded as part of a company. However, the deferred tax liability will often be included in the calculation of the purchase price for the company. Although the registration fee and deferred tax do not impact liquidity in a share deal, there are typically additional costs for accountants and lawyers as a share deal is a more complex transaction than an asset deal.

[5] Changes in the property value, are reflected in the income statement of companies that own investment properties. Value adjustments affect the company's results, but they are treated differently for tax purposes than other income and expenses. There is no ongoing corporate tax on value adjustments for properties; the tax is deferred until the property is sold.

CHART 7

Transaction volume by property type

Transaction volume for commercial real estate in Denmark

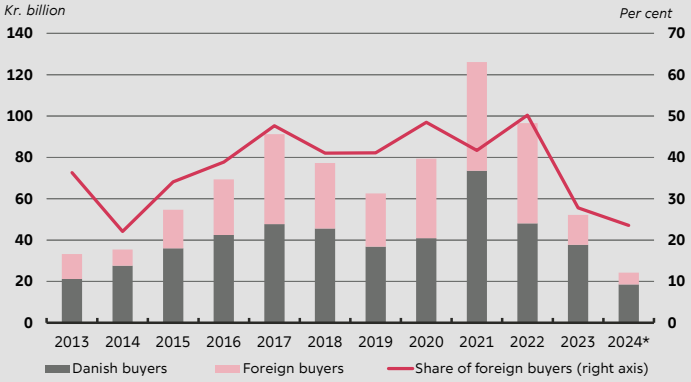


Note: Transaction volume for commercial real estate in Denmark by type of property. *Other* includes hotels, parking lots, undeveloped plots and other property types. Data for 2024 includes January-August.
Source: ReData and own calculations.

CHART 8

Transaction volume by residence of buyer

Transaction volume for commercial real estate in Denmark



Note: Transaction volume for commercial real estate in Denmark by residence of the buyer. Data for 2024 includes January-August.
Source: ReData and own calculations.

03
Business models of CRE companies

CRE companies own real estate with the purpose of generating profit in the form of rental income and capital gains, and the assets are financed by bank and mortgage debt and equity. The income of CRE companies therefore primarily consists of rental income, while costs are primarily interest payments.[6] The liquidity of CRE companies is thus sensitive to changes in rental income and interest payments. A fall in rental income, for example due to lower demand for office spaces or an increase in interest payments, can put pressure on the liquidity position of CRE companies. As the assets of CRE companies are mostly investment properties, changes in property values, while not affecting liquidity, can lead to large changes in the equity ratio, and affect the value of collateral CRE companies can pledge for external financing.

This section provides an overview of the business model of CRE companies, focusing on the economic drivers of income and expenses.

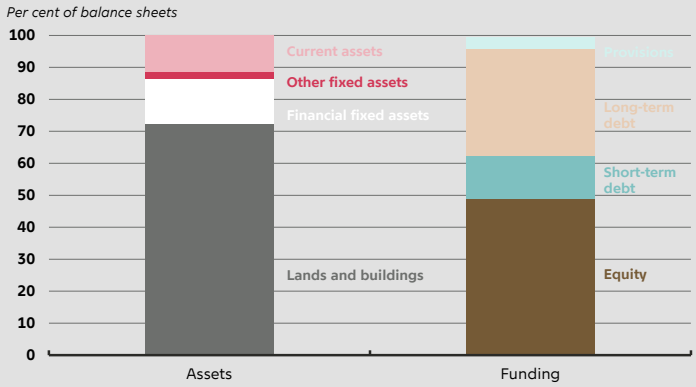
Balance sheets of CRE companies

Real estate companies are capital-intensive companies with large balance sheets. The industry's share of Denmark's gross value added is 10-12 per cent, while only accounting for 2 per cent of employment. Two-thirds of the assets of CRE companies are land and buildings, see chart 9. Financial fixed assets accounts for 14 per cent of assets, and these assets mainly consists of investments in subsidiary companies, associated companies and joint ventures, as well as derivatives used, for example, for hedging of interest rate risks. The remaining assets are primarily current assets. The composition of assets of CRE companies are markedly different from other non-financial companies, see chart 10. For these companies, land and buildings only account for 5 per cent of assets, while other fixed assets and currents assets account for a much larger share of assets.

[6] In addition to financing costs, there are operating expenses in the form of administration, maintenance and labour costs. Depending on the company's degree of financial sophistication, valuation changes in debt and derivatives, such as interest rate hedges may also be included in the income statement.

CHART 9

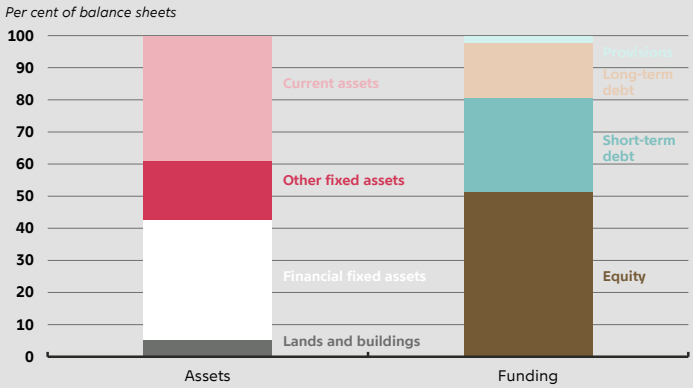
Balance sheets of CRE companies



Note: Assets and funding by percentage of total assets of Danish CRE companies in 2023. CRE companies are defined by industry codes as described in box 1. Sole proprietors and unincorporated partnerships are not included.
Source: Bisnode, Experian and own calculations.

CHART 10

Balance sheets of other non-financial companies



Note: Assets and funding by percentage of total assets of Danish non-financial companies in 2023, excluding CRE companies. Sole proprietors and unincorporated partnerships are not included.
Source: Bisnode, Experian and own calculations.

The funding side of CRE companies are mainly made up of equity and short- and long-term debt. Provisions, mainly deferred tax, account for just a few percentage points of total liabilities.[7] Equity accounts for half of the total funding for CRE companies; however, the equity share can vary considerably. Compared to other non-financial companies, CRE companies have more long-term debt, reflecting the much smaller share of current assets. The equity share is on average comparable to other non-financial companies.

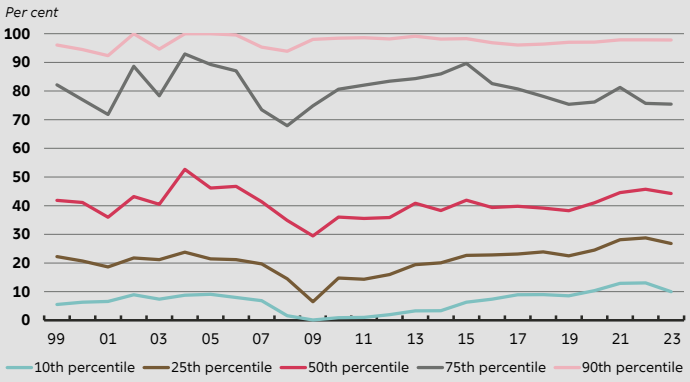
There are significant differences in equity rates between CRE companies. Chart 11 shows the distribution of equity. As buildings and lands make up a large share of balance sheets for CRE companies, a change in property values can have substantial consequences for the equity ratio. In the period up to the financial crisis, equity ratios were generally increasing, after which they dropped substantially. The median company saw its equity share drop by almost 20 percentage points to an equity share of 30 per cent, while the most leveraged companies saw their equity being completely wiped out. After the financial crises, equity ratios have increased, to some extent driven by the low interest rate environment in this period, which has increased the value of assets, and thus the equity share.

[7] Corporate tax on value adjustments for properties can be deferred until the property is sold as an asset deal.

CHART 11

Equity ratios for CRE companies

Distribution of equity ratios for CRE companies

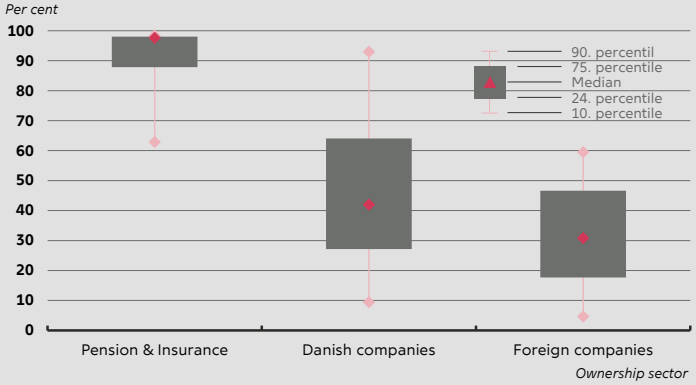


Note: Distribution of equity ratios for CRE companies weighted by size of balance sheets. The equity ratio is measured as total equity divided by total assets. CRE companies are defined by industry codes as described in box 1.
Source: Bisnode, Experian and own calculations.

CHART 12

Equity ratios by ownership sector

Distribution of equity ratios for CRE companies



Note: Distribution of equity ratios for CRE companies weighted by size of balance sheets by sector of ownership. The equity ratio is measured as total equity divided by total assets. CRE companies are defined by industry codes as described in box 1.
Source: Bisnode, Experian and own calculations.

CRE companies owned by the pension and insurance sector have much higher equity ratios than other companies, see chart 12. These companies are typically funded by the savings in the pension funds to provide a return for the pension fund. Most of these companies have equity ratios above 80 per cent, and over half are completely equity financed.

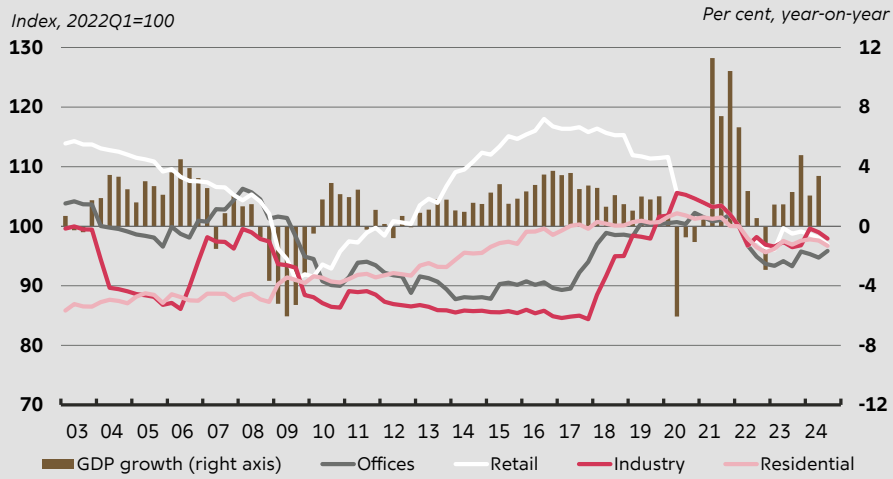
Rental prices

Growth in rental prices has generally followed economic activity, see chart 13. Increasing business activity and employment will lead to larger demand for office and retail space, and higher household income will lead to larger housing consumption, increasing rental prices. Chart 13 shows real rental price indices for prime commercial real estate properties. Developments in rental prices for subprime properties tends to follow the same overall trends as prime properties, but have generally been more volatile, especially during the financial crisis. However, rental prices are also influenced by structural and industry-specific developments. The increase in online shopping[8] has increased the demand for logistics sites, as is evident in the strong price growth in the industrial property market from 2017 to 2020. This development is to some extent mirrored in the declining price development in the retail space market, which has also been influenced by a decrease in the number of physical retail shops.[9]

[8] See, for example, Danish Chamber of Commerce, E-handel i detailsektoren, March 2021 (link: https://www.danskerhverv.dk/siteassets/mediafolder/dokumenter/01-analyser/analysenotater-2022/e-handel-i-detailsektoren.pdf) and European Systemic Risk Board, Vulnerabilities in the EEA commercial real estate sector, January 2023 (link: https://www.esrb.europa.eu/pub/pdf/reports/esrb.report.vulnerabilitiesEEAcommercialrealestatesector202301~e028a13cd9.en.pdf).
[9] Danish Chamber of Commerce, Et faldende antal fysiske butikker vil stadig spille en nøglerolle i fremtidens detailhandel, April 2022 (link: https://www.danskerhverv.dk/siteassets/mediafolder/dokumenter/01-analyser/analysenotater-2022/et-faldende-antal-fysiske-butikker-vil-stadig-spille-en-noglerolle-i-fremtidens-detailhandel.pdf).

CHART 13

Real rental prices and GDP growth



Note: Real rental prices for offices, retail and industry are for high-standard properties in Copenhagen. Rental prices for residential properties are the index for rent paid by tenants in the net price index. Rental prices for residential units include both dwellings with marked-based rents and rent-controlled dwellings. Prices are deflated by the private consumption deflator. GDP growth are real quarterly figures.
Source: Statistics Denmark, Colliers, and own calculations.

Rental prices for properties used for business activities are more volatile than rental prices for residential properties, as they are more heavily affected by business activity and more exposed to vacancies. Furthermore, demand for residential units is influenced by prices for owner-occupied housing. When costs of owning a housing unit are larger than the rental costs, demand for rental units will generally increase. In recent years, the costs of owning a housing unit in the larger cities have exceeded the costs of renting a similar housing unit,[10] increasing demand for rental units, which can result in increasing rental prices.

Rental prices for properties used for business purposes are less regulated than rental prices for residential properties, which to some extent explains the less volatile price developments in the residential property segment. Rental prices on business properties are to a large extent determined through negotiation between the parties. However, rents are often indexed to the net price index in rental agreements. Rental prices on dwellings are subject to comprehensive regulation. In general, residential properties built before 1992 are subject to rent controls. These properties account for 75 per cent of residential rental units (not counting non-profit housing organisations). For residential units built after 1991, the rent is set through negotiation between the parties. However, after the rental agreement has been entered, the rent can only increase with the net price index.[11] As rents are often indexed to the net price index, investments in commercial real estate to some extent provide a hedge against inflation, but not fully, as rental prices on new leases are determined by supply and demand.

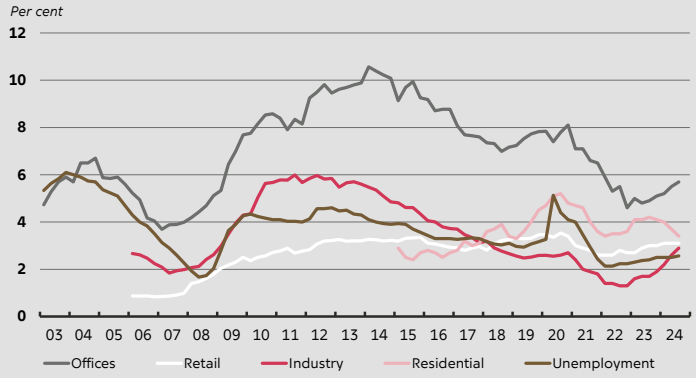
[10] Finance Denmark, Analyse, I flere og flere kommuner er det blevet dyrere at eje end at leje en bolig, February 2024 (link: I flere og flere kommuner er det blevet dyrere at eje end at leje en bolig (finansdanmark.dk)).
[11] Following the high rise of inflation in 2022, the Danish parliament decided to temporarily suspend the possibility of adjusting rents with the net price index, instead capping the increase at 4 per year in 2023 and 2024.

Rental prices, and in turn income for CRE companies, are also influenced by vacancy rates and building activity. For example, demand for office spaces depends on economic activity and employment, and vacancy rates have largely followed the unemployment rate, see chart 14. Vacancy rates for offices, retail and industrial properties increased after the financial crisis due to higher unemployment and lower economic activity, but also to some extent due to extensive building activity in the years leading up to the financial crisis, resulting in increased supply of commercial buildings, see chart 15. In recent years, vacancy rates for business properties have started to increase, albeit from low levels. This has coincided with an increasing number of newly constructed buildings for business purposes, increasing the supply of available buildings. However, the construction of new buildings has sharply declined in 2024 due to rising building costs. Vacancy rates for office space have not risen sharply following the COVID-19 pandemic. This contrasts with developments in some large American cities, such as Los Angeles and San Francisco, which have seen a large increase in vacant office spaces due to a large increase in employees working from home, reducing demand. A possible explanation for these differences in vacancy rates is different preferences of office workers. On average, Danish office workers work fewer days at home than American office workers, and their desired number remote workdays is also lower than that of American office workers (Aksoy, C. G. et al. 2023). Vacancy rates for residential properties are somewhat less volatile than for business properties, as demand is less influenced by economic activity. Vacancy rates for residential properties have been fairly stable since 2015, showing only a slight upward trend. This stability has occurred despite a significant increase in newly constructed residential buildings, which seem to have been absorbed by the demand for housing.

CHART 14

Vacancy rates by property type

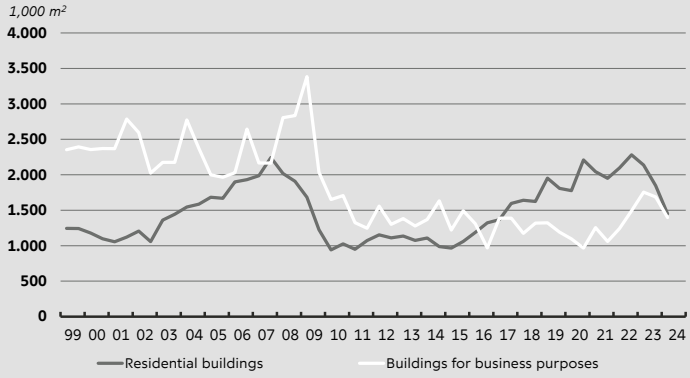
Available m² by per cent of estimated building mass



Note: Vacancy rates for offices, retail and industry are based on figures from Ejendomstorvet. Vacancy rates for residential properties are based on figures from EjendomDanmark. Seasonally adjusted unemployment by per cent of the labour force.
Source: Ejendomstorvet, EjendomDanmark, and own calculations.

CHART 15

Completed construction by building type



Note: Completed buildings, seasonally adjusted.
Source: Statistics Denmark.

Interest expenses

Interest payments on debt is a significant part of the costs in the income statements of CRE companies. The majority of external financing of Danish CRE

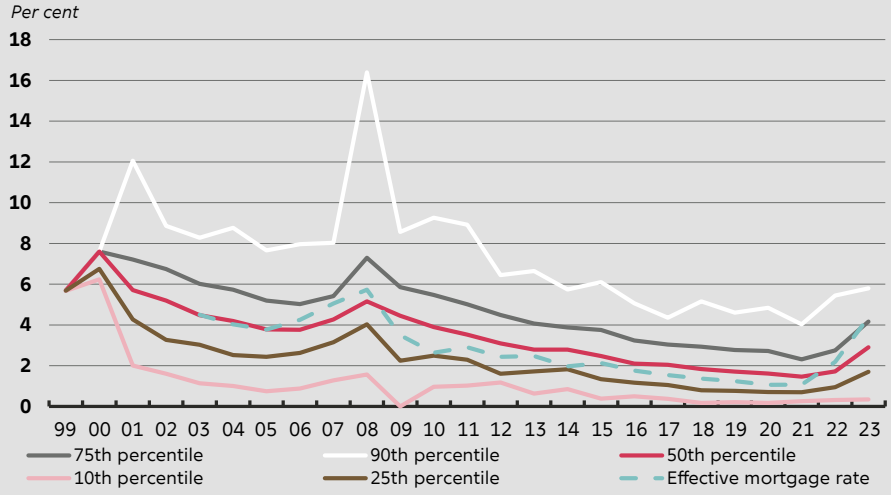
companies is mortgages with collateral in the properties they own.[12] There is only very limited use of corporate bonds among Danish CRE companies. More than 70 per cent of the mortgages are variable-rate. Interest expenses as a share of debt have followed interest rates on Danish mortgages bonds quite closely, see chart 16. Some companies use interest rate derivatives to hedge their interest rate risk. This is especially common among the largest companies.[13]

Companies owned by the pension and insurance sector generally have lower interest rates on their debt compared to other companies. This may be a result of their very high equity ratios contributing to a low credit risk on their limited amount of loans.

CHART 16

Interest payments for CRE companies

Interest payments by per cent of debt



Note: Distribution of interest payments by per cent of debt for CRE companies weighted by size of balance sheets. The effective mortgage rate is annual averages of rates, including administration rates, for new loans to non-financial companies, across all interest rate fixation periods. CRE companies are defined by industry codes as described in box 1.
Source: Danmarks Nationalbank, Bisnode, Experian and own calculations.

Mortgage loans collateralised by commercial properties generally have long maturities, see chart 17. Most mortgages have a remaining maturity over 20 years, and the average maturity is around 22 years.[14] Danish CRE companies thus rarely have large amounts of outstanding debt that is in need of refinancing. This is in contrast to companies in other Nordic countries and in the rest of Europe. For example, companies in Norway and Sweden rely extensively on bond financing, with much shorter maturities, leading to large volumes of debt requiring

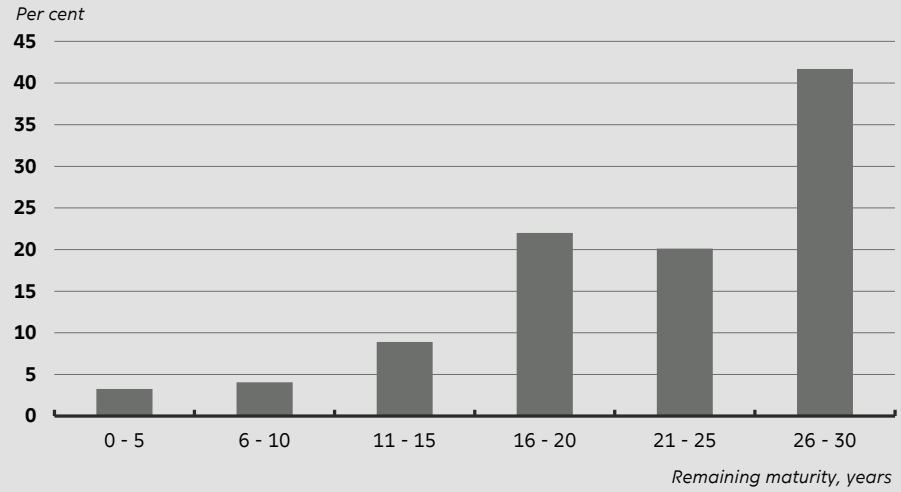
[12] Danish mortgage credit institutions only offer loans secured against real estate and work as financial intermediaries between investors and borrowers in a pass-through system. Credit mortgage institutions are non-deposit takers meaning that all loans are financed through the issuance of covered bonds. When loan takers are granted a mortgage loan, the mortgage credit institution issues bonds that are sold to investors.
[13] Danmarks Nationalbank (2023).
[14] Most mortgages have an initial maturity of 30 years.

refinancing within a shorter time span.[15] Although mortgages in Denmark collateralised by commercial real estate have a long time to maturity, over two-thirds of mortgages are adjustable interest rates. CRE companies are thus exposed to interest rate risk, even though their refinancing risk is limited compared to companies that finance themselves with bond or bank debt with much shorter maturity. In addition to interest payments on debt, CRE companies have other financial income and costs in the form of valuation changes on their mortgage debt and derivatives, e.g. used for hedging interest rate risks. These items are part of the income statements and thus affect profits and return on assets; however, they do not affect liquidity.[16]

CHART 17

Mortgages loans to CRE companies by time to maturity

Mortgage loans



Note: Mortgage lending to Danish CRE companies by remaining maturity of the loans at end of 2024Q2.
Source: Danmarks Nationalbank.

Return on assets

Return on assets of CRE companies have historically followed the business cycle, see chart 18. During the economic expansion leading up to the financial crisis, return on assets increased, both as a result of increasing rental income due to strong demand, but also due to increasing property values. Investment properties are measured at fair value in financial statements, and changes in the value of investment are part of the income statements. Changes in the value of the properties can thus have sizeable implications for profits. After the crisis, returns fell considerably with a quarter of the companies earning negative profits, both due to falling rental income and negative price developments in the commercial real estate market. The long expansion after the financial crisis saw a stable increase in returns, peaking during the COVID-19 pandemic. In 2022 and 2023,

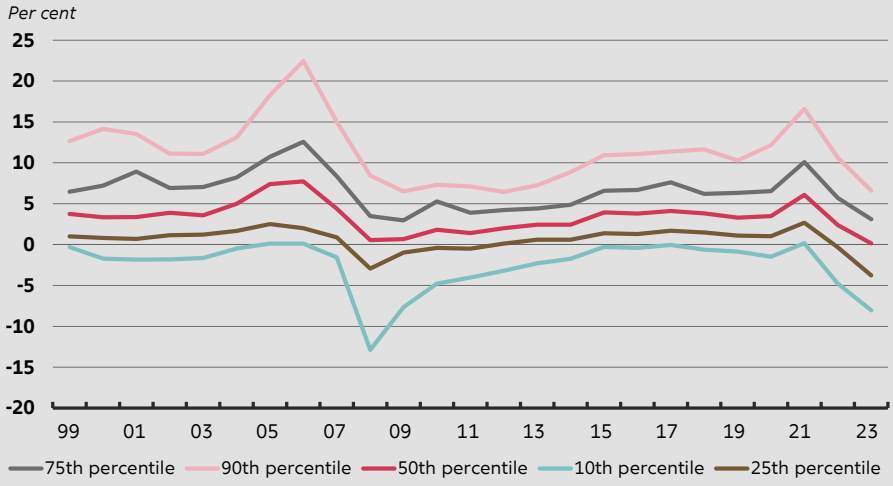
[15] Volume- weighted time-to-maturity for bonds issued by Norwegian commercial real estate companies are 3 years, while bank loans typically have a maturity of 3-5 years (Bjørland (2023) and Hagen et al. (2018)). Around three quarters of Swedish commercial real estate companies' issued bonds are maturing over the next 3-4 years (Riksbanken (2024)).
[16] Mortgage debt and derivatives are measured at fair value in financial statements, and changes in the values of these are part of the income statement. Some interest rate derivatives do require variation margins and therefore can affect liquidity.

returns fell, as the sharp increase in the interest rate level due to rising inflation pushed property values down.

CHART 18

Return on assets for CRE companies

Return on assets



Note: Distribution of return on assets, weighted by the size of balance sheets. Return on assets is measured as profit after tax divided by total assets. CRE companies are defined by industry codes as described in box 1.
Source: Bisnode, Experian and own calculations.

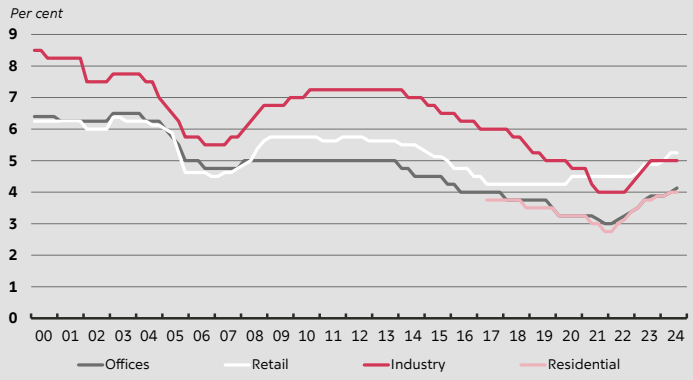
04
Prices of commercial real estate

The assets of CRE companies are mostly investment properties, and price developments on commercial properties are thus an important driver of the size of balance sheets and capital gains for CRE companies. This section describes the principles underlying the valuation of commercial real estate. Furthermore, a simple property value indicator is introduced based on accounting practices in financial statements.

It is customary to express prices and values of commercial real estate in terms of yields. The yield is the investors' rate of return for investing in a given property and is the operating income in per cent of the purchase price or capital value of the property. A higher yield thus implies a lower value or price of a property for a given level of operating income and vice versa. Chart 19 shows the yields for prime commercial real estate properties in Copenhagen, i.e. high-quality properties on prime locations with relatively low risk of vacancy. Yields on office, retail, industrial and residential properties have followed similar developments since 2000, mostly differing with respect to the level of the yield between the four types of properties. However, yields on retail properties, reached their lowest point in 2017 and started to increase in 2020, in contrast to yields in other segments, which reached their lowest point during the COVID-19 pandemic and started to increase in 2022 as the interest rate level started to increase in response to surging inflation levels. The development for retail yields to some extent reflects the increase in online shopping and conversely a decrease in demand for physical retail stores.

CHART 19

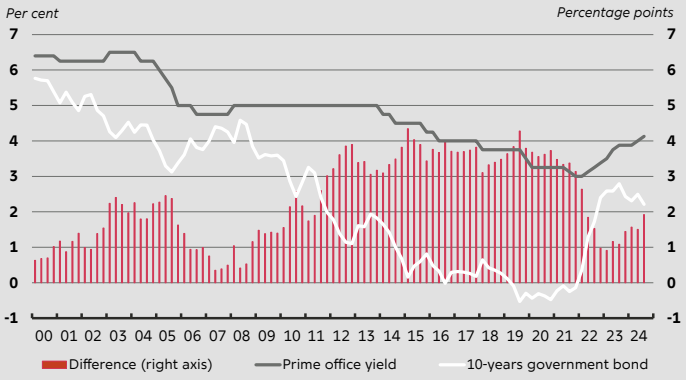
Yields for prime properties in Copenhagen



Note: Yields for prime properties in Copenhagen.
Source: Colliers and CBRE Research.

CHART 20

Yield gap for prime offices in Copenhagen



Note: Yields for prime offices in Copenhagen and redemption yields for 10-year government bonds.
Source: Colliers, CBRE Research and Statistics Denmark.

Yields requirements consist of a risk-free rate plus a risk premium. Yields in the commercial real estate market are often benchmarked against 10-year

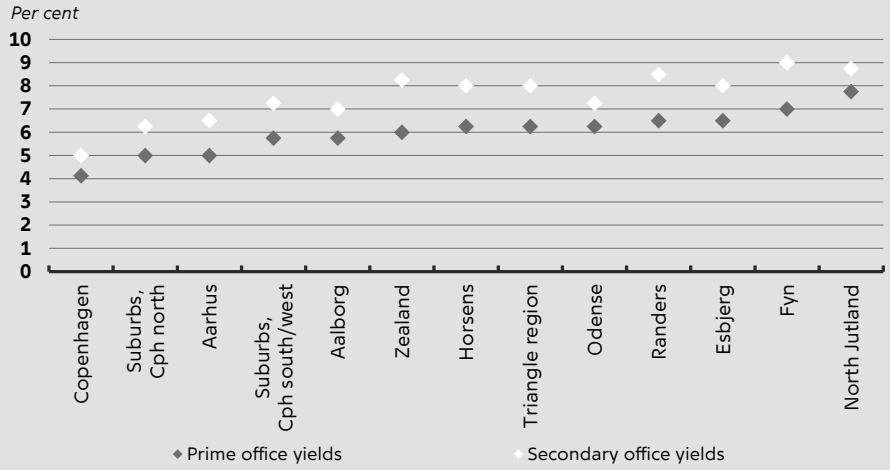
government bonds as a measure of the risk-free rate. The difference between the two can thus be viewed as a risk premium, see chart 20. Risk premiums fell in the years leading up to the financial crisis, after which they increased until 2012. Up until 2022, risk premiums hovered at around 3-4 percentage points. The sharp increase in the interest rate level in 2022 has only partly been mirrored by an increase in the yields, resulting in a decrease in the risk premium. The risk premium for prime Copenhagen offices is currently close to the average level over the past 25 years.

Risk premiums can be divided into market risk and specific risk. Market risk are risk factors that affect all segments of the commercial real estate market. This includes macroeconomic developments, funding conditions and structural or legislative changes. An example of increasing macroeconomic risks can be found in the years following the financial crisis, where rising unemployment and lower demand for office spaces increased the risk premiums for office buildings.

Specific risk is related to the individual property and depends on several factors, such as the quality, location and condition of the property, the risk of vacancy and the duration of leases. Specific risk factors are reflected in the differences in yield levels across locations and quality of the property, see chart 21. Prime offices, that is high-quality offices in prime locations with relatively low risk of vacancy, have lower yields than secondary offices, as the risks of vacancy and need for renovation is lower. Secondary properties will thus usually trade at a lower price. Yield levels are generally lowest in and around the larger cities, and in locations with relatively high population densities, reflecting lower specific risk.

CHART 21

Office yields by location



Note: Net initial yields on prime and secondary offices in 2024Q3. Prime offices are office properties of high standard and in the best locations. Secondary offices are office properties of lower standard and/or in less attractive locations.
Source: Colliers.

The required rate of return also differs between property investment strategies, reflecting a risk-return trade-off. An investment in high-quality properties with low risks of vacancy where the return is primarily generated through the cash flow provided by rental income will have a relatively low required rate of return.

Investment in properties in need of renovation, or development of new properties on vacant plots with the aim to generate a return through a sale of the property, will have a larger required rate of return since the uncertainty regarding future market conditions implies that these are riskier investments.

Property value indicator for commercial real estate

There are only few sources of price indices for commercial real estate, and they are often at a high level of aggregation.[17] The commercial real estate market is highly heterogenous, and the number of transactions that can be used to compare values and adjust for quality are limited. Also, commercial properties are often sold as share deals, i.e. transactions of the company that own the properties, rather than the properties themselves. The volumes of these transactions are high and are often not recorded in public registers. Thus, price indices based on surveys or small samples are emblematic of the commercial real estate market.

As an alternative to price indices for commercial real estate, an indicator for the value of commercial real estate can be constructed using market data on yields and rents. A common method for estimating the value of an asset is the present value of the free cash flow generated by the asset. In the case of commercial real estate, the free cash flow that is available is the net rental income, i.e., the rental income the property can generate less operating expenses. Operating expenses include administration and labour costs, among other things, as well as maintenance costs of keeping the value of the property from depreciating. The value of a commercial property can therefore be stated as:

$$Value_\tau = \sum_{t=\tau}^{\infty} E\left[\frac{Net\ rent_t}{(1+y_t)^t}\right]$$

The value is thus the present value of expected future net rental or operating income, and y_t is the required rate of return for the type of property. The value of commercial real estate will rise when investors' expectations of future net rent levels increase and their required rate of return falls and vice versa. This approach resembles accounting practices for measuring fair values of investment properties in financial statements of CRE companies, which usually use a discounted cash-flow model.

If net rental income and the required rate of return are assumed to be constant, the value can be stated as:

$$Value = \frac{Net\ rent}{y}$$

This simple relationship can be used to construct an indicator for values of commercial real estate. We use yields as a measure of the required rate of return and gross rent. Several market participants provide aggregate statistics of yields and rents for different segments of the commercial real estate market. The implied value can thus be estimated from yields and rents and can be viewed as a simplified version of a discounted cash flow model.[18]

An indicator of values should ideally be constructed on the basis of net operating income. However, the data used in the indicator is gross rental income (i.e., not net of operating expense), and is therefore an approximation.[19] If operating cost are approximately equal to a constant share of rental income, an indicator based on gross rents will accurately reflect an indicator based on net rental income. If operating costs have risen more than rents, the indicator will slightly overstate

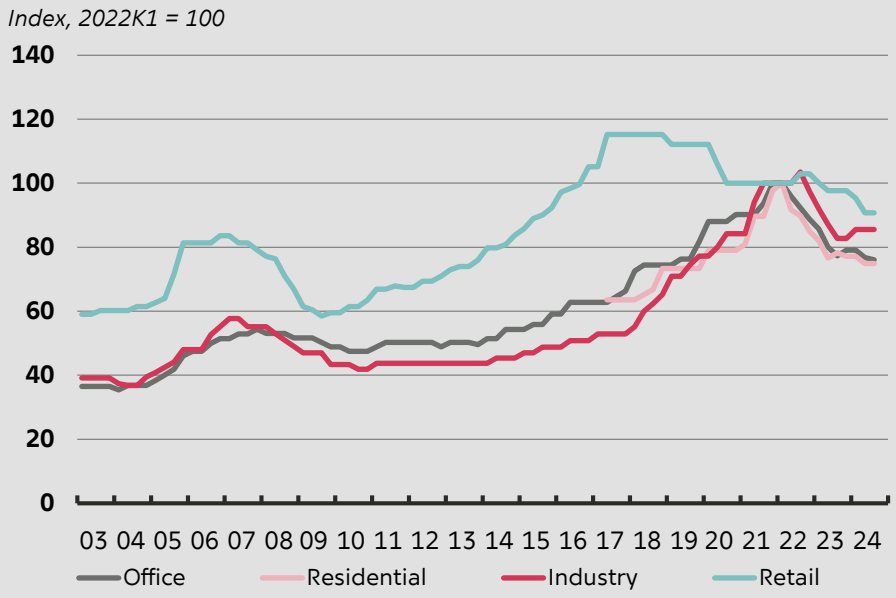
[17] See, for example, European Systemic Risk Board, Vulnerabilities in the EEA commercial real estate sector, January 2023, and European Systemic Risk Board, Commission Staff Working Document, Final Progress Report on Commercial Real Estate Statistics, December 2023.
[18] See also Hagen (2016).
[19] The data on rents is per square metre, so the indicator is effectively an indicator of square metre values.

increases in values over time, and if costs have risen less than rents, the indicator will understate the development in values. Also, we use yields instead of the required rate of return, as these are not observed. Yields can underestimate the actual required rate of return in periods when investors expect rental income to rise rapidly and vice versa.

The property value indicator for prime Copenhagen properties is shown in chart 22. Values increased rapidly in the years leading up to the financial crisis and fell considerably afterwards, bottoming out in 2010 for offices and industrial buildings, and in 2009 for retail properties. Values then increased steadily until 2022, when interest rate levels and yields started to rise, pushing down values.[20] The indicator is shown for nominal property values, but can be deflated to show real values. The indicator for real property values shows similar developments as the nominal indicator, although with somewhat lower values in the last two years as the price level increased substantially.

CHART 22

Indicator for property values of commercial real estate



Note: Indicator for nominal property values of commercial real estate for primary properties in Copenhagen.
Source: Colliers and own calculations.

The indicator can be constructed for other segments of the commercial real estate market accordingly. Values for secondary properties in Copenhagen have developed in a similar way to prime properties but tend to be somewhat more volatile than prime properties. Secondary properties are more exposed to vacancy in economic up- and downturns, resulting in more variable values. Since the indicator is based on aggregate data series, the indicator can be viewed as showing average developments for the different segments. Changes in values for

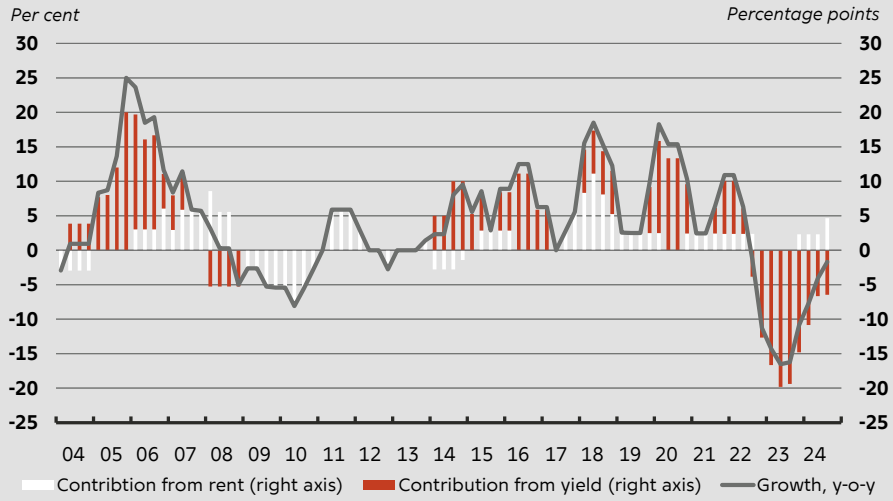
[20] The Central Bank of Norway (2003, 2024) shows similar reductions in values for prime Oslo offices since 2022 as chart 22 shows.

individual properties will naturally differ depending on, for example, the development of rental income in the specific property.

Changes in values can be decomposed into changes stemming from changes in rents and changes in required rate of return. Chart 23 shows an approximate decomposition of the growth rates of values of prime Copenhagen offices into contributions from rent and yields.[21] The recent reductions in values are mostly driven by increasing yields. Increasing rent levels due to indexation to the net price index have contributed to higher values, but compared to the effect of higher yields, the contribution is modest. This is in contrast to the developments after the financial crisis, where value reductions were driven by reductions in rent levels. Yields were unchanged in the years after the onset of the financial crisis, reflecting a larger risk premium as the interest rate level fell. The large negative effect of rising yields on values in recent years should be seen in light of the low interest rate levels and very low yield levels before this period. The yield for prime Copenhagen offices have risen from 3 per cent in the beginning of 2022 to just over 4 per cent in the third quarter of 2024, an increase of roughly 33 per cent. For other types of properties with higher initial yield levels, the effect of the recent increases in yield levels on values are smaller.

CHART 23

Growth rates in property value indicator for prime office spaces in Copenhagen



Note: Yearly growth rates in the property value indicator for prime office space in Copenhagen, with an approximate decomposition into contributions from yields and rents.
Source: Colliers and own calculations.

[21] Using the approximation that $\Delta ln\,(Value_t)$ is roughly equal to the percentage change in values, the percentage change in the value is approximately equal to the percentage change in rental income minus the percentage change in the yield. The approximation is more accurate for small percentage changes.

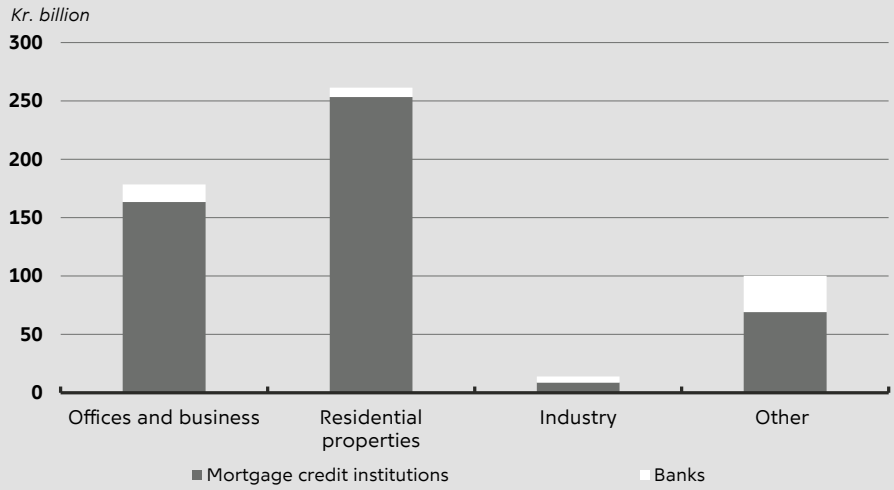
05
Banks' and mortgage credit institutions' exposures towards commercial real estate companies

CRE companies account for a large share of credit institutions' exposures towards non-financial companies, and developments in the commercial real estate sector are thus an important driver of credit institutions' overall credit risk. This section describes credit institutions' exposure to CRE companies, focusing both on the type of property and the geographical location. The section also provides a description of the historical developments in credit institutions' exposures towards commercial real estate and how it has previously led to large losses for credit institutions.

CHART 24

Loans to CRE companies by property type

Bank and mortgage loans to CRE companies



Note: Bank and mortgage loans to CRE companies at end of 2024Q2. Loans are divided by the type of property collateral. *Other* includes agricultural properties, undeveloped plots, and properties for social, cultural, and educational purposes as well as bank loans without property collateral.
Source: Danmarks Nationalbank.

37 of all loans to non-financial companies are to CRE companies. Out of these, 89 per cent (kr. 495 billion) are mortgages, while the remaining 11 per cent (kr. 59 billion) are bank loans, see chart 24. For mortgage credit institutions, loans to CRE companies account for 47 per cent of all loans to non-financial companies. The corresponding share for banks is 13 per cent. In addition to these

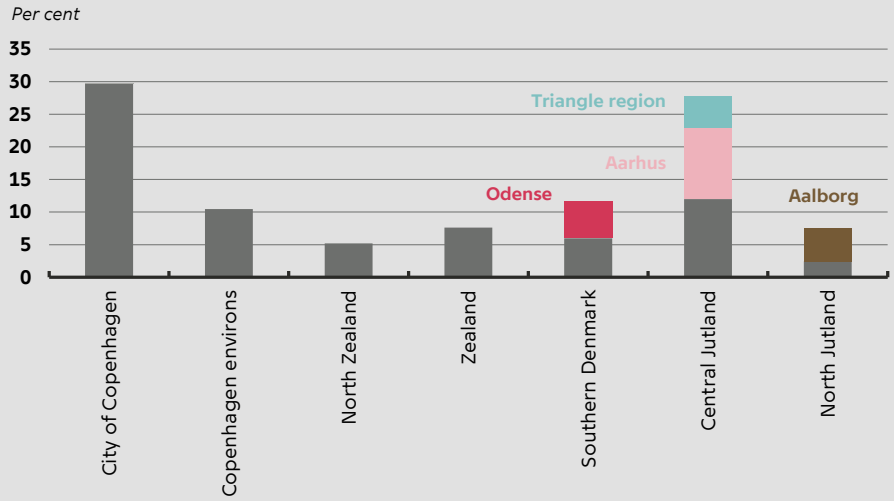
exposures, credit institutions also have exposures to the buy-to-let segment in the household sector of around kr. 46 billion, mostly mortgages. This is sole proprietors owning often smaller apartment buildings or multifamily houses and acting as landlords. Companies involved in commercial property development are related to CRE companies.[22] Credit institutions' exposures to these companies are limited, with banks' and mortgage credit institutions' exposures amounting to kr. 5 and 12 billion respectively.

Approximately half of the loans to CRE companies are collateralised by residential properties while one-third are collateralised by offices and business properties. Developments in these markets are thus the most important drivers for the risks associated with credit institutions' exposures towards CRE companies. Up to 80 per cent of the property value of residential rental properties can be financed with mortgages, and up to 60 per cent of the property value of offices and business properties can be financed with mortgages.[23]

CHART 25

Loans to CRE companies by region

Bank and mortgage loans to CRE companies



Note: Bank and mortgage loans with property collateral to CRE companies at end of 2024Q2. The triangle region includes Vejle, Kolding, and Fredericia municipality. Bornholm municipality is included in Copenhagen environs.
Source: Danmarks Nationalbank.

Banks' and mortgage credit institutions' exposures towards CRE companies are concentrated in and around the larger cities in Denmark, see chart 25. Loans collateralised by properties in the City of Copenhagen, Aarhus, Odense and Aalborg account for over half of credit institutions' exposures towards the CRE companies, and the City of Copenhagen alone accounts for just under a third of total loans towards CRE companies.[24] Developments in the commercial real estate market in the larger cities, especially in the residential and office segment, are

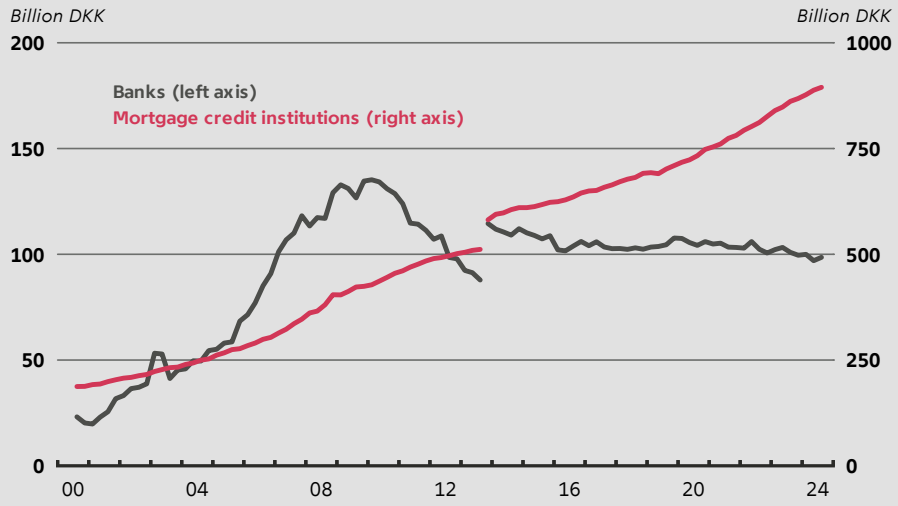
[22] DB industry code 411000.
[23] The loan limit can be increased to 70 per cent if the mortgage credit institution provides additional security for the share of the loan that exceeds 60 per cent of the property's value.
[24] Almost all loans to CRE companies are collateralised by properties. Less than 2 per cent of exposures are backed by other types of securities or are unsecured. This is mostly credit lines in banks.

thus the most important drivers for the risks associated with credit institutions' exposures towards CRE companies. The distribution of credit institutions' exposures across geographical locations resembles the distribution of the stock value of commercial real estate quite closely, see chart 1.

Banks' and mortgage credit institutions' lending towards CRE companies increased rapidly in the years leading up to the financial crisis, see chart 26. Here we show lending to the broader segment of real estate activities which also includes non-profit housing organisations and housing cooperatives, as it is not possible to isolate lending to CRE companies from other real estate activities in the historical data.[25] From 2001 to 2009 banks' lending increased from kr. 20 billion to over kr. 130 billion, a more than sixfold increase. The high growth in banks' lending was especially pronounced in 2005-2007. During and after the crisis, banks' exposures have been reduced, and during the past 10 years, lending to the real estate sector amounted to roughly kr. 100 billion. Mortgage credit institutions' lending to the real estate sector also saw a strong increase before the financial crisis, with lending doubling from 2001 to 2009. The growth in mortgage lending was especially pronounced within loans to CRE companies. In 2001, lending to non-profit housing organisations made up just under three-quarters of mortgage credit institutions' lending to the real estate sector. By 2010 this figure had decreased to a third. In contrast to bank lending, mortgage credit institutions' lending to the real estate sector have continued to increase after the financial crises. Growth has picked up in recent years, with yearly growth rates increasing to around 6 per cent after the pandemic.

CHART 26

Loans to the real estate sector from banks and mortgage credit institutions



Note: Lending to real estate activities, including sole proprietors, by banks and mortgage credit institutions, nominal values. There is a data break in 2013 due to the transition from MFI2 to MFI3.
Source: Danmarks Nationalbank.

Lending to the CRE companies has previously resulted in large losses. During both the 2008-2010 financial crisis and the 1987-93 banking crisis, banks incurred

[25] Real estate activities include CRE companies, non-profit housing organisations, housing cooperatives, real estate agencies and other minor real estate related industries. Non-CRE companies accounted for 40 per cent of real estate activities at the end of 2023.

large impairment charges on loans issued to the real estate sector. Impairment charges on loans to the real estate sector made up the largest share of the impairment charges during both crises.[26] Several banks failed in both crises and a large share of these were characterised by high credit growth, especially to the real estate sector, large exposures to the real estate sector and a relatively high number of large individual exposures to single companies.[27] Banks' credit growth was high in the years leading up to both crises after which it fell sharply, becoming negative during the crisis years. Mortgage credit institutions also had strong credit growth leading up to both crises. However, in contrast to banks, credit growth continued for the mortgage credit institutions during the crisis years. The period leading up to both crises saw large increases in property values and subsequently large decreases in values. Banks with large exposures towards the real estate sector experienced high impairment charges as property prices fell. A contributing factor to the falling prices in the 1980s and 90s was a boom in construction, leading to excess capacity of commercial real estate.

A number of regulatory measures addressing banks' and mortgage credit institutions' exposures towards real estate activities have been introduced. In 2010 the Danish Financial Supervisory Authority introduced the Supervisory Diamond based on the experiences from the financial crisis. Among other things, the Supervisory Diamond defines limits for banks' exposures towards real estate activities as a share of total exposures and sets limits on credit growth and the share of large exposures towards single customers.[28] In 2018 the Supervisory Diamond for mortgage credit institutions was introduced, limiting credit growth to different segments, including commercial real estate used for residential purposes.[29]

In April 2023 the Danish Financial Supervisory Authority introduced guidelines on best practices for financing of rental properties and construction and development of rental properties.[30] One of the guidelines concerns the liquidity of the rental property. As a starting point, the operating profit from the rental property should be able to service the loans with traditional financing, i.e. a 30-year mortgage with fixed interest rate and amortisation, and a 10-year annuity bank loan.

In October 2023 the Danish Systemic Risk Council proposed a sector-specific systemic risk buffer on bank and mortgage loans to CRE companies with the purpose of increasing the credit institutions' capitalisation, making them better able to withstand impairment charges and losses on their loans to CRE companies.[31] The risk buffer came into effect in June 2024.[32]

[26] Danmarks Nationalbank (2023).
[27] Abildgren and Thomsen (2011), Rangvid et al. (2013).
[28] Danish Financial Supervisory Authority (*link*).
[29] Danish Financial Supervisory Authority (*link*).
[30] Danish Financial Supervisory Authority (*link*).
[31] See The Systemic Risk Council (*link*).
[32] Ministry of Industry, Business and Financial Affairs (*link*).

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