FINANSINSPEKTIONEN

The Commercial Real Estate Market and Financial Stability

28 May 2019

28 May 2019
Ref. 18-20931

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Summary

The commercial real estate market plays a key role in financial stability. The financial position of commercial firms is currently satisfactory, but many firms are vulnerable to higher interest rates and weaker economic growth. In a scenario with financial stress, problems in the commercial real estate sector could cause significant credit losses for the Swedish banks. The capital held by the banks for risks in their commercial real estate lending does not cover the losses that may occur under such a stress. Even if the banks' total capital and resilience are satisfactory, FI believes that the banks need more capital to cover the risks in their commercial real estate lending. Therefore, in the autumn of 2019, FI will decide on measures that will require banks to hold capital that covers the risks in lending to commercial real estate firms.

A prolonged period of strong economic growth, good access to capital and low interest rates has contributed to a rapid increase in commercial real estate prices in Sweden. Commercial real estate firms have also taken on more debt to finance acquisitions of properties and investments in new production.

This report shows that the financial position of commercial real estate firms is currently satisfactory, but interest rates are at historically low levels and corporate debt is high. If the economic conditions were to deteriorate and commercial real estate firms were to find it more difficult and more expensive to finance their operations, this could lead to credit losses at the banks that are the largest lenders to the commercial real estate sector.

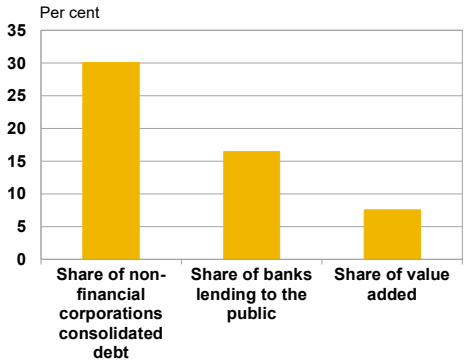
FI's stress tests indicate that credit losses following an economic stress could exceed the capital the banks are holding to cover the risks in their commercial real estate lending. Still, the banks' total buffer capital requirements are substantial. If credit losses were to arise also in other sectors, it is FI's assessment that the banks hold sufficient capital for absorbing the total losses that could occur following a shock. However, FI takes the position that the banks should hold enough capital for its exposures in each segment in order to offset the credit losses that could arise in a crisis. FI's stress tests in this report indicate that the capital requirements for commercial real estate lending are much too low in relation to the credit losses that could arise.

In its report *Stability in the Financial System* published in May 2019, FI presents its overall assessment of the credit risks associated with the banks' lending to commercial real estate firms. FI believes that the banks do not set aside enough capital to cover the loss risks in this lending. Therefore, in the autumn of 2019, FI will decide on measures that will require banks to hold capital that covers the risks in lending to commercial real estate firms.

Background

The commercial real estate (CRE) market plays a key role in financial stability. This is because the market is large and closely connected to the financial system via the banks' extensive lending to CRE firms. The CRE market is also sensitive to changes in the economy as a whole, which makes it cyclical. Historically, this combination has meant that problems in the CRE sector have repeatedly triggered or amplified financial crises.

Diagram 1: Commercial real estate firms are highly leveraged



Source: FI and SCB

Note: "Banks" refers to Danske Bank, Handelsbanken, Nordea, SEB and Swedbank in Q3 2018. The percentage of non-financial firms' consolidated debt and the percentage of value added refer to 2017.

FI has been tasked with safeguarding the stability of the financial system. Historically, problems that have arisen on the CRE market have either triggered or amplified financial crises. One reason for this is that the CRE sector is sensitive to financial cycles, but the CRE market is also large, primarily debt-financed and thus strongly connected to the financial system.[1] The consolidated debt of CRE firms amounted to SEK 1,687 billion in 2017.[2] This debt has also increased by around 28 per cent between 2012 and 2017. Large and rapidly growing debt makes firms more sensitive to shocks.

Lending to CRE firms constituted approximately 43 per cent – around SEK 775 billion – of the major banks' lending to the non-financial sector in Sweden in Q3 2018. This corresponds to more than 16 per cent of the major banks' total corporate and household lending and 101 per cent of the banks' CET 1 capital.[3] Problems that arise in the CRE sector can therefore lead to significant credit losses for banks. In a worst-case scenario, this could pose a threat to financial stability.

PURPOSE AND DATA

This report analyses risks and vulnerabilities on the CRE market in Sweden and their potential impact on banks' credit losses and financial stability. This impact is expected primarily to occur via the major Swedish banks' lending to the CRE sector but also to a limited extent via the capital market.

To obtain a clearer overview of the risks associated with loans to CRE firms, FI has gathered detailed data from banks and bank branches that conduct extensive business in lending to CRE firms.[4] This material refers solely to loans recognised in Sweden and consists of three parts:

1 MSCI estimates that the Swedish CRE market comprises approximately 40 per cent of GDP. This is substantially larger than in other European countries (see also Report on vulnerabilities in the EU commercial real estate sector, ESRB report, November 2018).

2 Refers to Swedish non-financial firms that are classified at Statistics Sweden as SNI code L (68) with the activity heading Real estate activities.

3 Refers to Danske Bank, Handelsbanken, Nordea, SEB, and Swedbank.

4 The benchmark analysis of the loans to CRE firms includes data from Danske Bank, Handelsbanken, Nordea, SEB and Swedbank. Commercial real estate (CRE) is defined as properties owned with the objective of generating income by renting out the property to tenants. This includes office, retail, hotel, and logistics properties as well as housing properties and community properties. Community properties owned and used by the public sector (state, municipal and county) are not included in the analysis. Housing properties with owners from the public sector are not included, either. These types of real estate are not

Table 1. Statistics from the portfolio data

Number of loans	38,228
Number of counterparties	9,995
Outstanding amounts, SEK billion	734
Property value, SEK billion	1,131
Interest, average	1.6
LTV ratio, median	55

Source: FI

Note: The statistical summaries in the table have been processed by FI. The number of counterparties shows the total number of bank-specific counterparties. This means that if a counterparty has loans with two banks, the counterparty will be counted twice.

- **Microdata.** Data about all loans to CRE firms, including detailed data about loans, counterparties and collateral. The portfolio data refers to the end of Q3 2018.
- **Aggregate data**. FI also gathered data about the banks' total exposures to both the CRE sector and the public. The aggregate data contains time series and includes net provisions for anticipated and realised credit losses.
- **Qualitative information**. By answering a number of in-depth questions, the banks provided both general and detailed information that improves FI's understanding of the banks' lending to the sector. The questions relate to, among other things, how the banks apply restrictions to their total exposure to the sector.

In total, more than 38,000 loans distributed across almost 10,000 counterparties are included in the analysis (Table 1). The total value of the loans is approximately SEK 734 billion. The real estate that constitutes collateral for these loans has a total market value of SEK 1,131 billion.

COMMERCIAL REAL ESTATE AND FINANCIAL STABILITY

The CRE sector in both Sweden and other countries has often played a central role in major financial crises.[5] The crisis in Sweden at the beginning of the 1990s was triggered by a fall in CRE prices, and a large portion of the banks' credit losses was linked to the CRE sector (see *The Swedish financial crisis at the beginning of the 1990s*). The direct link between the CRE market and financial stability is primarily due to the debt held by CRE firms. These loans come from banks and investors who buy bonds and other debt instruments issued by the CRE firms. By lending money to CRE firms, lenders expose themselves to the risks associated with the CRE market. If the economic conditions for CRE firms were to deteriorate, for example as a result of an upswing in interest rates or an economic recession, these firms could find it difficult to make their interest and amortisation payments. This would affect banks in that their non-performing loans would increase, which ultimately leads to credit losses if borrowing firms become insolvent.

Because CRE firms also borrow significant amounts on the money and capital markets, they may find it difficult to renew their market financing if investors become less willing to purchase CRE firms' bonds and certificates. In order to repay market loans at maturity, the

associated with the same risk to financial stability as other CRE firms because of their ownership and stable rental income. The analysis also does not include agricultural and forestry properties.

5 This was the case, for example, in the Nordics and the USA at the beginning of the 1990s, and in the USA and several EU countries during the global financial crisis in 2007-2008. See, for example, Englund, P., "The Swedish Banking Crisis: Roots and Consequences", Oxford Review of Economic Policy, Vol. 15(3), 2004, pp. 80-97; Herring, R. and Wachter, S., "Real Estate Booms and Banking Busts: An International Perspective", The Wharton School Research Paper, 1999; and Kim, L., "Time-Varying Macroeconomic Risk and Commercial Real Estate: An Asset Pricing Perspective", Journal of Real Estate Portfolio Management, Vol. 10(1), 2004, pp. 47-57.

firms may need to borrow more from banks. This would increase the credit risks and capital need for the banks.

If the banks then experience both credit losses and an increase in their capital need for CRE exposures, there is a risk that their capital strength will be weakened. If the credit losses were to become so large that the survival of one or several banks could be questioned, this could weaken the public's trust in the banking system, and in turn this could lead to financial difficulties for the banks and, by extension, trigger a crisis for the banks. Because the Swedish banks are strongly interconnected, problems in one bank could quickly spread to other banks and thus pose a threat to the entire financial system.

Even for problems smaller in scope, banks may try to improve their weakened financial position by reducing their lending to other sectors in the economy. If lending to creditworthy households and non-financial firms would decrease in this way, this could have a negative impact on economic growth, which could further amplify an economic downturn. In other words, such a scenario could pose a threat to financial stability.

Swedish financial crisis at the beginning of the 1990s

At the beginning of the 1980s, the conditions for the Swedish economy changed. The Swedish credit market had previously been heavily regulated, but some of the regulations, including loan caps and interest rate limits, were being lifted. This made it easier for both households and firms to borrow money.

The Swedish economy was also being heavily stimulated at this time through political measures and a global boom. The tax rate was favourable (deductions for interest rate expenses to offset a high tax rate), and real interest rates were low. Driven by these favourable conditions, strong optimism emerged about the future of the CRE market, resulting in an increase in CRE investments. High demand for both housing and CRE, combined with the deregulations on the credit market, fuelled sharp growth in real estate lending. This contributed to rapidly rising real estate prices.

The banks focused almost exclusively on the market price in their lending, and they did not place a high value on the CRE firms' cash flows and their ability to make amortisation and real estate payments. The banks allowed high loan-to-value ratios in their lending, and as real estate prices rose it became possible to borrow even more using real estate as collateral. Thanks to increasing CRE prices, strong demand for commercial premises and good access to financing, there was also a spike in new production of CRE.

When the recession hit at the end of the 1990s, demand for CRE fell sharply and the real interest rate rose at the same time as measures were taken to reform the tax system. CRE prices plummeted, and many CRE firms went bankrupt. As a result, banks and financial firms experienced significant capital and liquidity problems and reported large credit losses. Extensive support from the state was needed to prevent the system from collapsing. During the period 1990–1994, the banks' total credit losses amounted to approximately SEK 175 billion, which corresponds to 10 per cent of GDP in 1994. During the years 1992–1993, CRE-related exposures constituted 43 per cent of the total credit losses. Of the CRE-

related lending transactions conducted in 1990, 40 per cent were classified as either realised credit losses or non-performing loans a mere three years later.[6]

6 See Wallander, J., (1994) ”Bankkrisen – Omfattning. Orsaker. Lärdomar”, chapter in ”Bankkrisen: rapporter av Håkan Lindgren, Jan Wallander, Gustaf Sjöberg”. “Losses” here refer to actual credit losses and non-performing loans. CRE loans also refer to loans to firms in the building sector and related services, but not to mortgages.

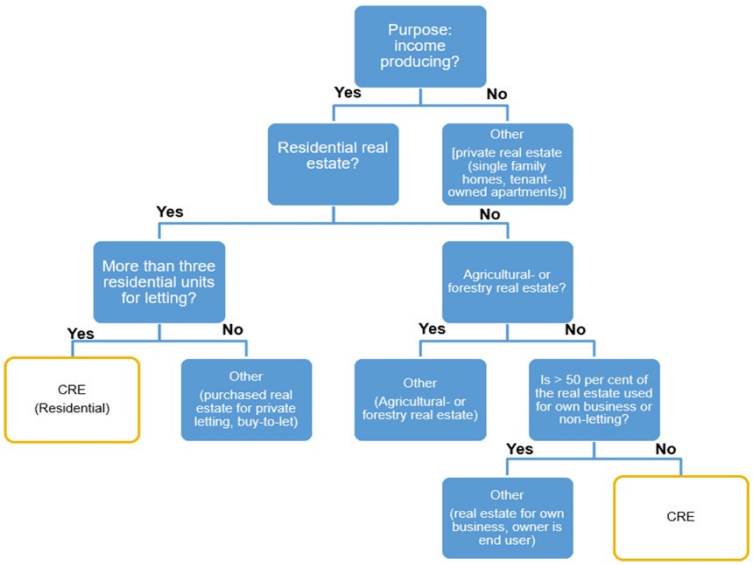
Commercial real estate market and its vulnerabilities

The CRE sector is large and currently has good earnings thanks to both high demand for rental premises and low interest rates. The CRE sector is capital-intensive and highly leveraged compared to other parts of the economy. Debt has also grown rapidly in recent years. An increasing share of the CRE firms' funding occurs on the capital market through bonds and certificates, but the majority of the CRE sector's loans still come from Swedish banks. Credit losses and the share of non-performing loans at the banks are low.

COMMERCIAL REAL ESTATE GENERATES REVENUE FROM RENT

Different types of real estates have different characteristics; thus, their vulnerability to shocks varies as well. Therefore, the potential impact on lenders and financial stability varies depending on the type of real estate. It is FI's assessment that rental properties could pose greater economic risks to owners and their financiers than properties held for other purposes. Therefore, this report will focus on the CRE market.[7] The CRE market is defined as real estate owned with the objective of generating revenue through renting to tenants (Diagram 2).

Diagram 2. Definition of commercial real estate

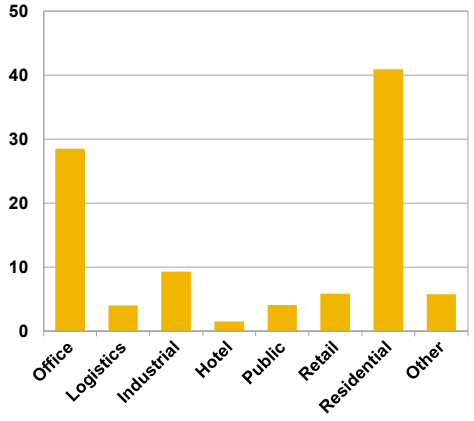


Source: FI

7 FI follows the risks associated with household mortgages in its annual report *The Swedish Mortgage Market*.

Diagram 3. Distribution of market values based on the type of real estate

Per cent

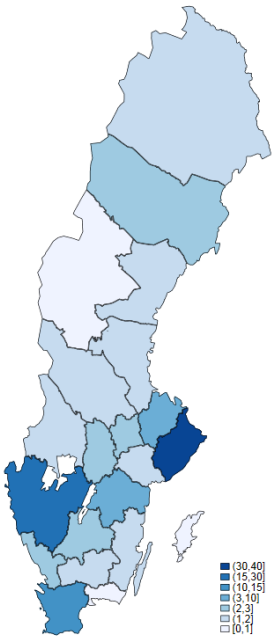


Source: FI

Note: The diagram shows the sum of the market values for different types of real estate in relation to the total for all types of real estate.

Diagram 4. Market values per county

Per cent



Source: FI

Note: The diagram shows the sum of the market values for each county in relation to the total for all of Sweden. Refers to all types of real estate.

Commercial real estate refers in this report only to real estate where the majority of the property's surface area generates revenue from rent. This definition includes, for example, premises used for offices, retail properties, manufacturing facilities, hotels, logistics properties, residential properties and community service properties (such as health care, schools and assistance). Commercial residential real estate refers only to properties with more than three residential units (normally apartments) that are rented to individuals other than the owner. Real estate owned by tenant-owners associations is not included.

Financial risks differ depending on the type of real estate

The CRE sector includes many different types of real estate. Offices and residential properties constitute more than 50 per cent of the part of the Swedish CRE market that is owned by professional investors.[8]

In FI's analysis of the exposures of the major Swedish banks to commercial real estate, offices and housing represent almost 70 per cent (Diagram 3).[9] In this sample, 36 per cent of the total real estate values are in Stockholm, 18 per cent are in Gothenburg and 12 per cent are in Malmö (Diagram 4).

The most important factor in the development of the CRE market is growth: both current national and regional economic growth and expectations of future growth.[10] Economic growth contributes to greater demand for commercial premises. Higher demand for commercial premises in turn leads to a higher occupancy rate in the existing real estate portfolio and rising rent levels.

Income from and the value of different types of CRE are influenced largely by the same fundamental factors. This means that CRE is also sensitive to the same shocks, but sensitivity varies since CRE differs in terms of location, size, use and tenant composition. These factors affect stability in the demand for rental premises and thus rental income. For example, properties used for office, retail and industrial activities are often more sensitive to a downturn in the economy than residential and community service properties, where rental income and occupancy rates tend to be more stable over time. Community service properties often have long rental contracts and tenants with high creditworthiness (state, county or municipal). Rentals in residential properties are also stable in general: the tenants are households that need somewhere to live and seldom stop paying their rent, even following a loss of income or increase in expenses. There is also not a lot of mobility on the residential rental market.

8 Source: MSCI. Data from MSCI refers only to professional CRE investors. The percentages are based on estimated market values.

9 Refers to real estate used as collateral through mortgage deeds in FI's analysis of the banks' lending to CRE firms. FI finds in its analysis through the banks a larger percentage of private investors than the percentage identified by MSCI. Housing real estate in general constitutes a higher percentage of the portfolios of private investors than professional investors. This could explain the differences in the percentages.

10 ECB (2008), "Commercial property markets – Financial stability risks, recent developments and EU banks' exposures". Nordlund, B. och Lundström, S. (2011). "Commerical Real Estate and Financial Stability", The Riksbank's inquiry into the risks in the Swedish housing market. Case B., W.N. Goetzmann and K.G. Rouwenhorst (2000). "Global Real Estate Markets – Cycles and Fundamentals". NBER Working Paper 7566.

In contrast, office, retail and industrial activities are associated with a higher financial risk since the tenants as a rule are commercial firms. For these tenants, both the need for premises and their desire and ability to pay the rent is dependent on the firm's success. Since firms' earnings are generally closely linked to macroeconomic developments, the income and vacancy rate in these types of real estate are cyclical.

The market conditions for different types of real estate are affected by not only cyclical economic factors but also more structural conditions. The location of the real estate object, including proximity to transportation and central business districts, are factors that have a significant impact on demand and the level and stability of the rental income.

Long-term changes in the community also affect demand for premises. Shifts in household consumption behaviour have a large impact on retail properties, for example in that the increasing e-commerce trend changes and reduces the need for physical stores. In exchange, e-commerce increases the need for warehousing and logistics premises in order to be able to distribute various goods to consumers. The economy's ongoing structural transformation toward more service- and knowledge-intensive activities and the trend toward a more flexible use of floor space affects office and industrial real estate more than other types of real estate.

PARTICIPANTS ON THE CRE MARKET

There are many different participants on the CRE market, including real estate companies, private investors, institutional investors (such as insurance companies and pension funds), investment funds, public sector entities and foreign investors. These participants have different ownership structures, different objectives for owning real estate and different business models.

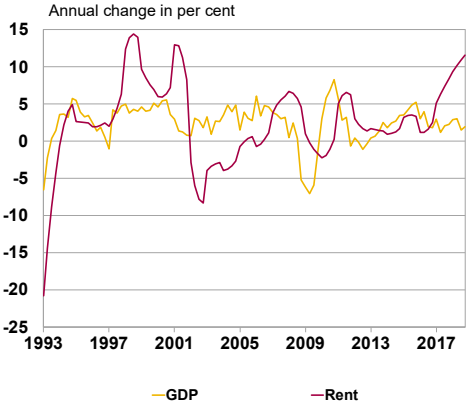
Often, the participants' portfolios are concentrated to one or several types of real estate that are very close to one another geographically, but there are also bigger firms that diversify their risks by owning and managing a combination of types of real estate in different regions, for example offices, retail and housing. CRE firms strive to be profitable by increasing the rental income of their properties over time. This can be achieved by renting out larger areas and raising the average level of rent while also keeping control of operating and maintenance costs. The objective is to increase the real estate's current and future net operating income and net cash flow in order to raise the value of the property.

CRE FIRMS' VULNERABILITIES

The CRE market has a number of inherent vulnerabilities. These vulnerabilities do not in and of themselves pose a threat to lenders and financial stability, but the CRE sector's links to the banking system and the capital market could lead to financial or macroeconomic instability if shocks were to occur. The type of the shock can vary, and in general shocks are difficult to predict and prevent. However, it is often possible to take measures that reduce vulnerability. It is also possible to monitor if and how vulnerabilities build up over time. FI is

Diagram 5. Office rent growth and GDP

Annual change in per cent

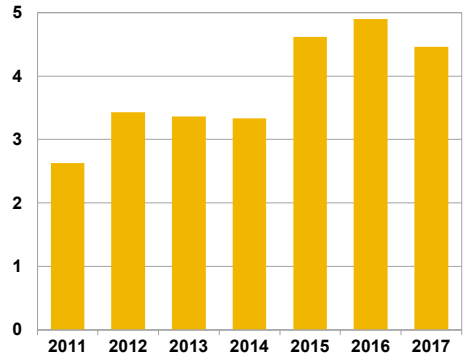


Source: Pangea and Statistics Sweden

Note: Office rent growth refers to prime locations throughout the country. Annual figures have been extrapolated into quarterly averages.

Diagram 6: Interest coverage ratio of CRE firms, median

Ratio

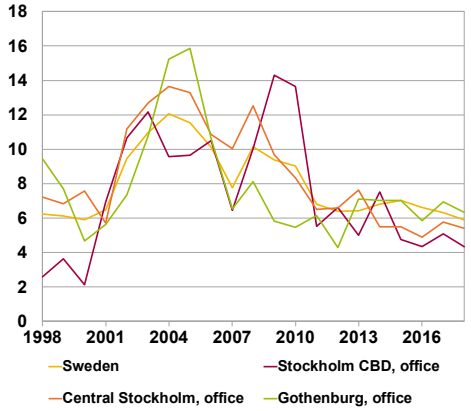


Source: FI

Note: The interest coverage ratio has been calculated as the CRE firms' net operating income in relation to their interest expenses. The data for 2017 includes 3,696 firms.

Diagram 7. Low vacancy rates

Per cent



Source: MSCI

Note: "Sweden" refers to the aggregate of all types of real estate.

therefore following indicators that capture vulnerabilities on the CRE market.

FI's vulnerability analysis is based on a framework developed by the European Systemic Risk Board (ESRB).[11] The ESRB analyses how vulnerable the financial system is to problems on the CRE market. The ESRB report identifies four categories of vulnerabilities: income, collateral values, financing and spillover effects. The first three categories identify and quantify inherent vulnerabilities in the CRE market. The fourth identifies and quantifies how CRE could affect the financial system. Together, the four vulnerability categories contribute to the quantification of the importance of the CRE market for financial stability. In the following sections of this report, FI presents its own analysis of the four vulnerability categories for the Swedish CRE market.

INCOME

Over the past few years, the economic conditions for CRE firms have been very favourable. Strong economic growth has led to increased demand for commercial rentals, which in turn has resulted in rising rent levels and increased occupancy. Rental income has thus gone up, which has contributed to visible improvements in the firms' net operating income and earnings. The current market conditions are presenting CRE firms with good possibilities for raising rent levels even further when older rental contracts expire. Office rents have increased faster than GDP over the past two years (Diagram 5).

The CRE firms' costs for loan-based financing fell significantly at the same, mainly due to the low interest rate environment, but also due to the relatively low margins in the banks' lending. Credit spreads on bond loan are also relatively low from a historical perspective. The lower funding costs combined with the high operating surplus means that the ability of the CRE firms to pay the interest on their loans is currently very good. This is illustrated by the high interest coverage ratio (Diagram 6).

Vulnerabilities in income

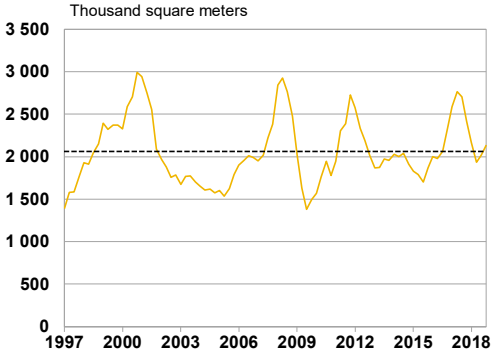
The risks associated with the CRE sector's income are primarily related to a downturn in demand for commercial premises. The vacancy rate in the CRE portfolio in general is low (Diagram 7), but demand to rent commercial premises is cyclical. If the economy were to dip, vacancies could increase, which would put downward pressure on rents and result in lower income for CRE firms. This risk is smaller for firms that hold residential properties since the underlying demand is more stable.

The relation between supply and demand of commercial premises can also be affected by an increase in the supply on the market from new production. Construction of CRE is largely driven by forecasts of strong rent levels in the future. One indicator of whether a construction project is profitable is if the expected market value for

11 ERSB (2018), "Report on vulnerabilities in the EU commercial real estate sector", European Systemic Risk Board.

Diagram 8: Granted building permission for commercial real estate

Thousand square meters



Source: Statistics Sweden

Note: The dashed black line shows the average since 1997. Commercial real estate includes offices, stores///, hotels, restaurants, industrial property and warehouses.

the new property exceeds the cost of building it.[12] The market value is largely determined by the expected future rental income. However, since construction can take time, the market conditions could change before the property is completed. As a result, future occupancy rates and rent levels that are assumed at the time of investments could prove to be too optimistic after-the-fact; in other words, the construction project's market value was overestimated at the time of the decision.

There is a risk that construction will begin on too many projects when the market is strong, for example at the end of an economic boom. There will then be an excess supply if the CRE projects are completed after the economy has started to deteriorate and demand is decreasing. The result can be rising vacancies and falling rents, which leads to lower net operating income and, in the long run, lower CRE market values.

The current situation on the Swedish market, with a combination of low vacancy rates and a normal level of new production, however, does not indicate that an excess supply is building up for commercial premises (Diagram 8).

As a whole, the indicators are showing that the CRE firms' earnings are currently good and the prospects for the future are stable. A strong dip in demand for commercial premises and rising borrowing costs are the largest risk factors and could have a significant negative impact on the CRE firms' income. A significant drop in income could impair the CRE firms' ability to make interest and amortisation payments on their loans.

CRE VALUES

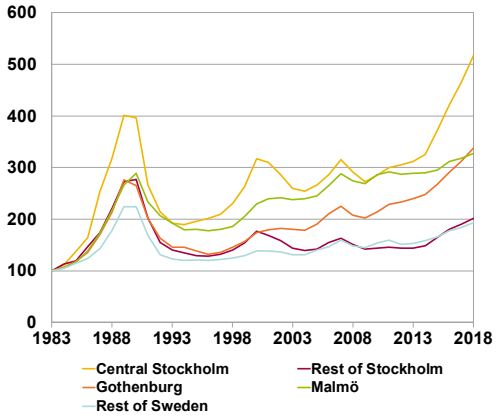
The value of CRE, in simplified terms, can be described as the discounted present value of the net cash flow or operating income, i.e. rental income minus operating and maintenance costs, which the property is expected to generate over time.[13] The interest rate used for discounting is the risk-free interest rate plus the risk premium investors require as compensation for the uncertainty in future net operating income. The discount rate can be viewed as the investor's yield requirement when acquiring real estate. The risk-free interest rate is the same regardless of the property, while the risk premium may differ between properties. All else equal, higher expected net operating income in the future means higher CRE values, while a higher discount rate (which can be caused by either a higher risk-free interest rate or a higher risk premium) means lower CRE values. However, the value of real estate cannot be considered to be independent of the price someone is willing to pay to acquire the property. Real estate prices are based on a calculated property value, but the price and the value do not always agree. In practice, prices are

12 The ratio between the property's market value and the cost of building the property (the replacement amount) is normally defined as Tobin's Q. This ratio can function as an indicator for whether it is profitable to build a new property. According to the theory, the build is profitable for a ratio over 1 while a ratio under 1 indicates the opposite.

13 Examples of other common methods used to value real estate are the sales comparison method, which is based on actual real estate transactions, and methods based on the production cost.

Diagram 9. Rapidly rising prices

Index 1983 = 100

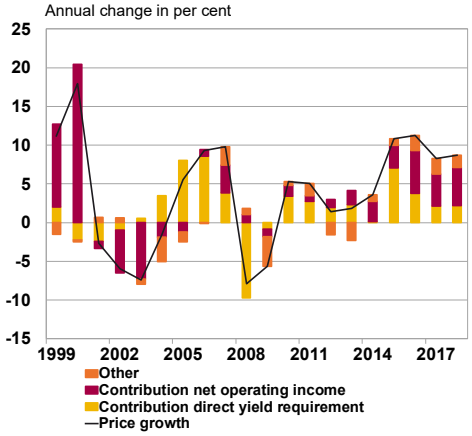


Source: MSCI

Note: Refers only to office buildings.

Diagram 10. Contribution to price growth

Annual change in per cent

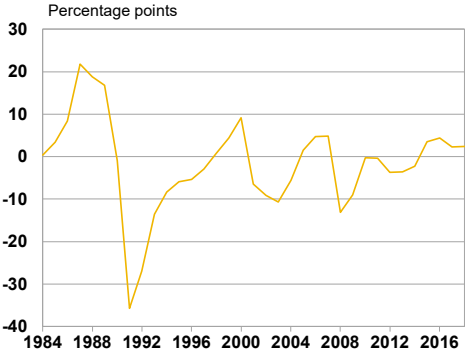


Source: MSCI and FI

Note: Decomposition of various factors' importance for the change in prices of Swedish offices. The calculation is based on a regression model where price growth is explained by the change in the yield requirement and net operating income.

Diagram 11. CRE prices growing faster than CRE firms' net operating income

Percentage points



Source: FI and MSCI

Note: The indicator shows the difference between the growth in market value and the growth in the firms' net operating income. This price-to-rent indicator is one way to measure the value of real estate.

also affected by other factors that are related to supply and demand on the CRE market.

Real estate prices in Sweden have increased sharply in recent years, primarily for offices in the central parts of Stockholm and Gothenburg (Diagram 9). A large portion of the upswing over the past few years can be attributed to higher market rents and thus higher expectations regarding net operating income in the future. However, a significant portion of the upswing cannot be attributed to this factor, but rather may be interpreted as investors accepting a lower yield requirement than they did before (Diagram 10).[14]

Vulnerabilities in the valuation

In nominal terms, CRE prices in Sweden are today approximately 63 per cent higher than in 2000, and in many cases the price levels are higher than prior to the crisis in the 1990s. When prices exceed historical peaks, the situation deserves special attention. One sign of a potential overvaluation is if price increases are not supported by a corresponding increase in the CRE firms' net operating income. CRE prices have grown faster than CRE firms' net operating income for the past few years (Diagram 11). Historically, periods during which the relative increase in CRE prices has exceeded the relative change in net operating income have often been followed by a fall in prices. Because expectations of future income have a major impact on prices, an overly optimistic view of the future could make CRE buyers more willing to pay prices that exceed the market values justified in the long run. Rapidly rising CRE prices combined with low yields could be interpreted as investors expecting a combination of high rents in the future, low risk premia and low interest rates. However, this combination has also previously been an indication of significant vulnerabilities and a fall in prices in the future.[15]

The yield on the Swedish CRE market is currently at a historically low level in absolute terms after having fallen in recent years (Diagram 12). The average yield for CRE in Sweden in 2018 was approximately 1.7 percentage points lower than the historical average.

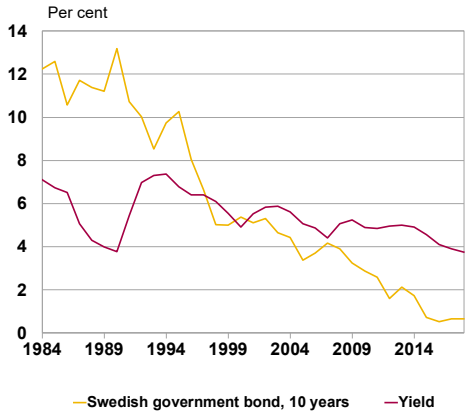
Transaction activity for CRE in Sweden is relatively high, which means that it is usually perceived as a reasonably well-functioning market. It is therefore possible to assume that the lower yield levels reflect downward-adjusted requirements on yields among the parties acquiring real estates.[16] One explanation for today's low yield requirement is that interest rates in general as well as the risk-free rate are very low. The low interest rates have lowered the nominal return that investors can expect from different types of investments. The fact that the expected yield has been adjusted downward in general may have contributed to Swedish and foreign investors increasing their demand for assets that are judged to give a high return in relation to a risk that has been perceived as low. This has made CRE appear to be

14 For CRE, yield is calculated as the firm's net operating income in relation to the price of the property.

15 ERSB (2018), "Report on vulnerabilities in the EU commercial real estate sector", European Systemic Risk Board.

16 On a rational and functioning market, the yield and the yield requirement are assumed to approach one another since the yield on the market should be adapted to the requirement from rational investors.

Diagram 12. Risk-free interest rate and yield on commercial properties



Source: MSCI and Thomson Reuters Datastream

an attractive asset class, which contributed to the increase in prices and, in turn, lower yields. The low interest rates may have also contributed to the increase in demand of CRE since loan-based financing of CRE acquisitions has become significantly less expensive.

Despite the low yield requirement for CRE, the so-called risk premium (the difference between the yield requirement and the risk-free rate) is high from a historical perspective. During previous periods of growing imbalances and before previous price falls, the risk premium on CRE has been low or negative. One interpretation of today's high risk premia is that the participants on the CRE market are factoring in rising interest rates and the uncertainty surrounding future net operating income when formulating their yield requirements. At the same time, market psychology tenets may indicate that prices are still sensitive to more significant interest rate increases.

In summary, CRE prices have increased sharply and are currently high from a historical perspective. Yield requirements have also fallen. There are signs indicating that the price increases in recent years may have been motivated by fundamental factors such as low interest rates and improved net operating income. If interest rates continue to be low in the future, the increase in CRE prices over the past few years does not seem unreasonable. However, part of the upswing in prices could be driven by investors' search for yield on a risk that has been perceived to be low. The risk premia are undoubtedly high, but if the view on the risk were to change, or if the belief in future income were to prove itself to be overly strong, the market will probably become more vulnerable. In addition, CRE prices are most likely sensitive to more significant interest rate increases.[17] Overall FI makes the assessment that the risks with the current CRE values are elevated.

FINANCING

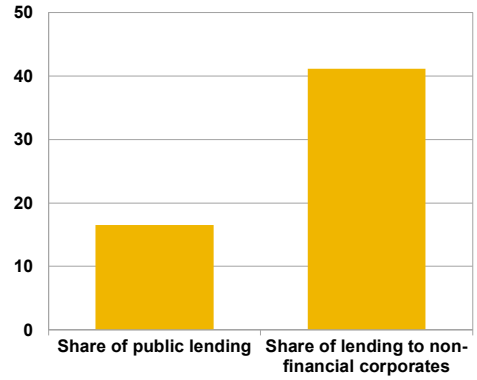
Both acquisitions and investments in new production of CRE are capital-intensive. The current profit from a property, the net operating income, as a rule is relatively low in relation to the price or investment fee of the property as new. This means that the investment horizon generally needs to be long, at least for participants who are not primarily focused on the transaction (those that primarily buy or build real estate to quickly sell at a higher price).

Real estate with good demand, a prime location and high quality are often considered a low-risk investment. The combination of long-term investment from holdings in real estate and the relatively low risk given stable occupancy levels often leads CRE firms to leverage their business in order to increase the return on equity that is put into the operations. CRE is also well-suited to be pledged as collateral for a loan, which means that financiers such as banks are happy to provide

17 CRE valuations in today's low interest rate environment are more sensitive to an absolute change in interest rates than in a more normal interest rate environment. An adjustment to the yield of 1 percentage point from today's low level (3.7 per cent) has a 36 per cent higher negative impact on CRE values than if the same change were to occur from the historical interest rate average (5.4 per cent), given no change in the net operating income. These calculations were made using the formula Market Value = Net Operating Income/ Yield Requirement.

Diagram 13. Banks' lending to CRE firms

Per cent

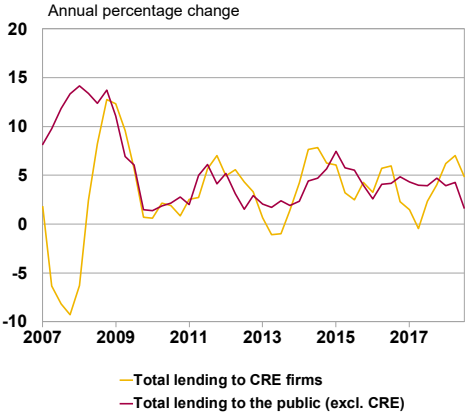


Source: FI

Note: Refers to Danske Bank, Handelsbanken, Nordea, SEB and Swedbank in Q3 2018 with regard to exposures recorded in Sweden.

Diagram 14. Banks' lending in Sweden

Annual percentage change



Source: FI

Note: Refers to Danske Bank, Handelsbanken, Nordea, SEB and Swedbank in Q3 2018 with regard to exposures recorded in Sweden.

such loans. Together, this has meant that CRE is largely financed by various types of loans.

CRE firms with access to the capital and money markets often finance their CRE holdings in the long term using equity, in the mid term using bank loans and bonds and in the short term using certificates. They also sometimes use a mix (hybrid) of equity and borrowed capital. Bank loans still constitute the majority of the Swedish listed CRE firms' interest-bearing liabilities.[18]

Banks traditionally offer loans in exchange for collateral in the property that will be financed by the loan. Normally, most purchases and sales of CRE occur through a company for tax reasons. This means that the party acquiring CRE in reality is buying shares in the company that owns the property. Therefore, the shares are pledged instead of the CRE when CRE firms pledge collateral for bank loans. Combinations of equity-based and CRE-based collateral also occur.

In the past few years, the bond market has become an increasingly important source of funding for the large CRE firms. As a rule, no collateral is pledged for bond-based borrowing. To have good access to the bond market, many CRE firms strive to receive a good credit rating from a rating institution. Credit ratings are dependent on the percentage of a firm's total CRE holdings that are pledged as collateral to other lenders. A low percentage of pledged collateral is considered an advantage since this means that there is a larger pool of assets available as protection for bond holders' claims if the CRE firm were to become insolvent.

Banks' lending to CRE firms

The five major banks' total lending to the public in Sweden in Q3 2018 amounted to just over SEK 4,687 billion.[19] More than 16 per cent, or approximately SEK 775 billion, consists of loans to CRE firms (Diagram 13). Of the major banks' total corporate lending in Sweden, roughly 43 per cent is to CRE firms. The real estate sector is thus the single largest sector in the category non-financial firms to which the major banks is exposed.

In addition to direct lending to CRE firms, the banks also have off-balance-sheet exposures. This refers primarily to CRE firms' granted but unutilised credit and liquidity facilities. For Q3 2018, these exposures amounted to more than SEK 96 billion. This means that approximately 9 per cent of the total exposure in the sector lies outside the banks' balance sheets.

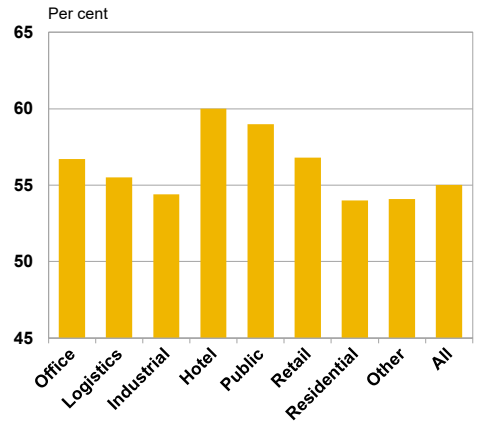
Since Q3 2008, the banks' lending to CRE firms has grown by more than 43 per cent, which corresponds to an annual increase of 4.3 per cent (Diagram 14). This is approximately the same as the growth in other lending to the public, which means that the CRE sector's percentage of the banks' total lending has not changed.

The average loan-to-value ratio (the loan amount in relation to the CRE value) for CRE loans at the major banks was 55 per cent in Q3 2018. This is low from a historical perspective. Hotels and offices

18 Refers to CRE firms whose shares are listed on Nasdaq Nordic Main Market.

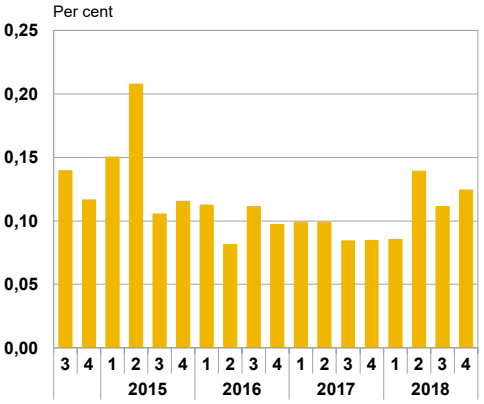
19 "Major banks" refers to Danske Bank, Handelsbanken, Nordea, SEB, and Swedbank.

Diagram 15. Loan-to-value ratios by type of CRE, median



Source: FI

Diagram 16. Low percentage of non-performing loans



Source: FI.

Note: The diagram shows the percentage of non-performing loans in corporate lending in Sweden for the major banks, with the exception of Danske Bank.

have the highest loan-to-value ratio at 60 and 57 per cent, respectively (Diagram 15).

Banks' credit assessment

The banks' lending to CRE firms today is different than their lending prior the crisis in the 1990s.[20] The loans back then were based on the CRE's assessed market values instead of its cash flows.[21] The approach was that the value of the CRE would endure, and that the properties would either be sold (and the loans repaid) or refinanced before the loans fell due. The CRE's cash flows generally did not extend to amortisation of the loans. High debt in relation to both the value of the CRE and the cash flows made the sector very vulnerable to a downturn in the economy, which eventually occurred and resulted in even worse cash flows and falling CRE values.

One of the most important lessons the banks learned from the crisis in the 1990s was that they should focus more on the CRE firms' current and future cash flows (operating surplus) and lower loan-to-value ratios in their lending. Another important lesson was the need to diversify their lending. Today, banks have credit policies and guidelines that, for example, can specify how much of the credit portfolio may consists of CRE-related loans, which types of CRE firms and CRE the bank may consider financing, and acceptable concentrations and loan-to-value ratios. The objective of these guidelines is to ensure that the banks do not take on risks that are too large and concentrated in relation to their business model and resilience.

One common way to ensure that the cash flows of individual borrowers are sufficiently strong or that the CRE used as collateral does not lose its value is for the loan agreement to include financial covenants. These covenants aim to give the banks' the opportunity to take action against a borrower to mitigate risk before the creditworthiness is excessively impaired. For example, financial covenants include a lower limit on interest coverage ratios or a cap on loan-to-value ratios. The extent of the borrower's commitment under such covenants can vary, and there are ramifications if the borrower does not fulfil them, such as increased amortisation payments, an extension of the loan at a higher interest rate or termination of the loan with immediate repayment.

Low percentage of non-performing loans

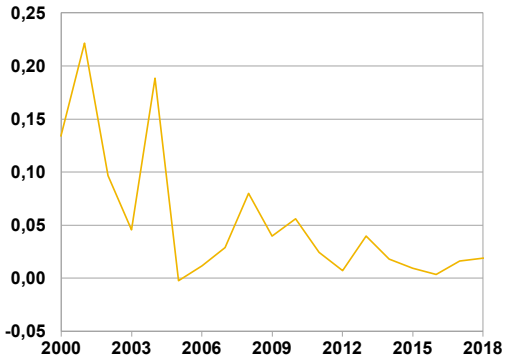
While lending to the CRE sector has grown sharply the past few years, the percentage of non-performing loans to CRE firms has been low.[22] The non-performing CRE-related loans in Sweden amounted to roughly SEK 1.2 billion in Q3 2018. This corresponded to around 0.11 per cent of the banks' lending to CRE firms (Diagram 16).

20 See also Wallander, J., (1994) "Bankkrisen – Omfattning. Orsaker. Lärdomar", for more information about the bank crisis in the 1990s.

21 The CRE values were estimated using the sales comparison method. Today, CRE is often valued using a method that focuses on cash flow.

22 A bank loan is considered to be non-performing when there are indications that the borrower cannot repay the loan due to financial difficulties or when 90 days have passed without the borrower paying the past due interest or amortisation.

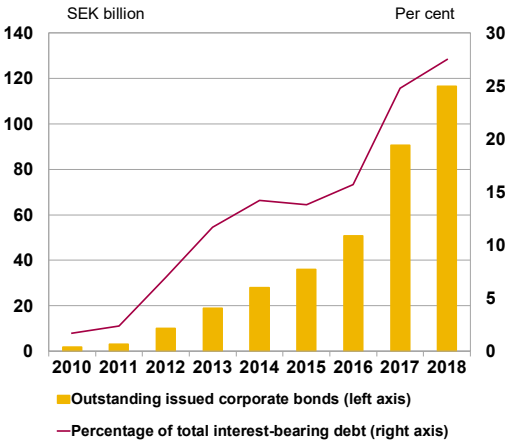
Diagram 17. Realised credit losses



Source: FI.

Note: Refers to the major banks and exposures to CRE firms.

Diagram 18. CRE firms' market financing



Source: Catella

Note: Refers only to listed CRE firms on Nasdaq Nordic Main Market's issued bonds in SEK.

The low volumes of non-performing loans are related to the strong economy over the past few years. Interest rates have also been low, and access to financing is good. The favourable economic conditions for CRE operations are also reflected in the low credit losses for the banks in recent years (Diagram 17). In 2018, total realised credit losses in CRE lending amounted to around SEK 146 million. This corresponds to around 0.02 per cent of the average outstanding credit volume to CRE firms. On average, credit losses have been at 0.05 per cent since 2000. Low credit losses at the banks during periods of strong economic conditions are expected. However, Sweden's experiences from the crisis in the 1990s show that credit losses from exposures to CRE firms can increase rapidly.

Bond- and certificate-based borrowing

Even if bank loans are still the largest source of financing for most CRE firms, borrowing on the money and capital markets through bonds and certificates has increased rapidly in recent years. The listed CRE firms' bond-based loans have grown from 2 per cent of their total loan-based financing in 2010 to 27 per cent in 2018 (Diagram 18).[23]

One of the major reasons for why investors' interest in CRE firms' certificates and bonds has grown is probably the low interest rates. Like many other central banks, the Riksbank has purchased government bonds in recent years to stimulate the economy. These purchases, in combination with prolonged low key rates, have pushed down the long-term interest rates on treasury bonds and other interest-bearing investments with low credit risk, such as covered bonds. One outcome has been that investors have sought other bonds where the absolute return continued to be reasonably high. The CRE firms have taken advantage of this situation to gain access to additional external financing. High demand has also meant that CRE firms pay lower credit risk premiums in addition to the risk-free interest rate for issuing bonds, which also boosted certificates and bonds in relation to bank loans.

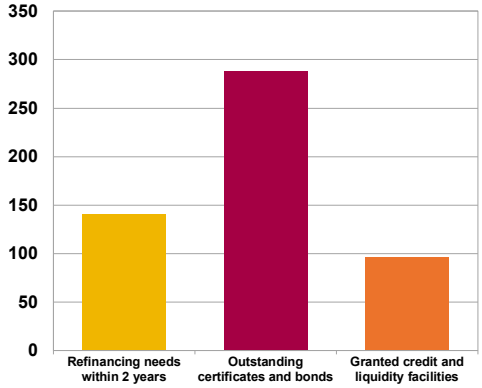
The negative interest rates on short maturities in Sweden the past few years have affected CRE firms' financing in a number of ways. Banks commonly use 3m STIBOR as a base when lending to CRE firms. Even though STIBOR has been negative since 2015, the banks often have an interest rate floor of zero per cent in their lending. Therefore, the borrowers have not gained full benefits of the low, short-term rates when borrowing from the banks. However, the negative STIBOR rate has been considered when setting the prices for bond issues, which has further increased the attractiveness of bonds for borrowers.

Institutions and firms that want to invest their liquidity in the short term have risked a negative return if they placed their funds as deposits in the banks the past few years. More investors have therefore sought other alternatives on the money market to achieve a positive return. CRE firms have also utilised this possibility by issuing certificates. The maturity of certificates is shorter than the maturity of bonds and bank loans and results in a lower borrowing cost for the CRE firms. However, because the firms' CRE assets are non-current,

23 Refers to CRE firms listed on Nasdaq Nordic Main Market.

Diagram 19. Outstanding volume of market financing in relation to off-balance sheets

SEK billion

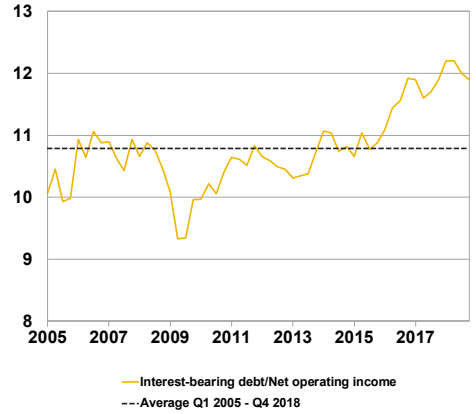


Source: Thomson Reuters Eikon and FI.

Note: Refers to off-balance sheets for Danske Bank, Handelsbanken, Nordea, SEB and Swedbank for Q3 2018. The refinancing needs refer to both certificates and bonds for 24 listed and institutional CRE firms in December 2018.

Diagram 20. Cash flow is more leveraged

Ratio

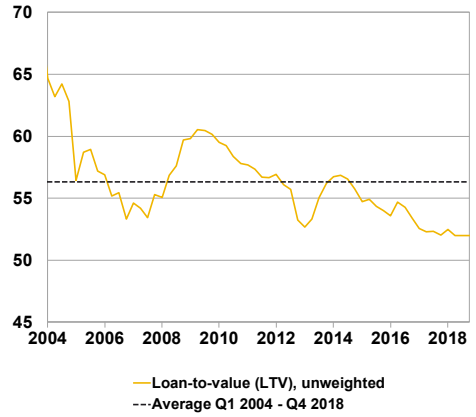


Source: Catella

Note: Refers only to listed real estate companies on Nasdaq OMX Nordic Main Market.

Diagram 21. Falling loan-to-value ratios

Per cent



Source: Catella

Note: Refers only to listed real estate companies on Nasdaq OMX Nordic Main Market.

over-utilisation of certificates could contribute to a greater imbalance between the maturities of the firms' assets and liabilities.

The CRE firms' total outstanding volumes of bonds and certificates amounted to SEK 293 billion in December 2018.[24] Of these loans, SEK 146 billion will fall due within two years and will need to be refinanced (Diagram 19). In Q3 2018, the CRE firms' granted but unutilised credit and liquidity facilities at the major banks amounted to SEK 96 billion.

Vulnerabilities in the financing

Because CRE firms utilise a high degree of loan-based financing, they are sensitive to shocks to the supply and cost of borrowed capital.

After the increase in borrowing the past few years, the interest-bearing liabilities of listed CRE firms in relation to income are at high levels even though the firms have had high and rising earnings (Diagram 20). In Q4 2018, the debt of CRE firms was on average 11.9 times larger than their net operating profit before financing costs. Large and rapidly growing debt can make these firms sensitive to shocks.

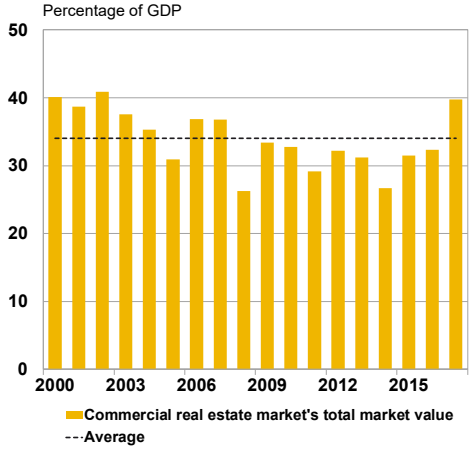
Despite the increase in total debt, the average loan-to-value ratio of the listed CRE firms has fallen to low levels (Diagram 21). The reason for this is that CRE market values have increased faster than the CRE firms' liabilities. If the market conditions were to change and CRE prices were to fall, the loan-to-value ratios could increase rapidly. Because CRE is often pledged as collateral for loans with the banks, falling CRE prices could mean that the banks' collateral values fall. This in turn could mean that the banks need to put aside more capital to cover the credit risks in their CRE lending.

The increase in market financing means that funds, insurance companies and other investors buying bonds issued by CRE firms are taking over some of the credit risks in the CRE sector from the banks. This risk diversification could have a positive impact on stability of the financial system, but it is not clear how stable the capital market is as a source of financing for the CRE firms in the long term or a future crisis.

There could be a risk that investors' interest in corporate bonds will be negatively affected if a CRE firm were to have problems repaying a bond loan that has matured or if there are general shocks to the CRE market. This could mean that the refinancing risk is larger for those lending to CRE firms. The effect could primarily be more expensive borrowing costs for the borrowers in question, but it could also spread to the entire sector. If this effect is significant, the CRE firms' earnings and creditworthiness would decline in general.

24 In December 2018, Swedish listed and institutionally owned CRE firms had approximately SEK 218 billion in outstanding issued bonds. The volume of certificates issued by CRE firms amounted to approximately SEK 70 billion. Refers to Akelius Residential Property, Atrium Ljungberg AB, Castellum AB, Compactor Fastigheter AB, Corem Property Group AB, Hembla AB, Fabege AB, Fastighets AB Balder, FastPartner AB, Hemfosa Fastigheter AB, Hemsö Fastighets AB, Hufvudstaden AB, Humlegården Fastigheter AB, Klövern AB, Kungsleden AB, NP3 Fastigheter AB, Sagax AB, Stendörren Fastigheter AB, Svensk FastighetsFinansiering AB (som ägs till lika delar av Catena AB, Diös Fastigheter AB, Fabege AB, Platzer Fastigheter Holding AB och Wihlborgs Fastigheter AB), Vasakronan AB, Victoria Park AB, Wallenstam AB, Wihlborgs Fastigheter AB, and Wilhem AB.

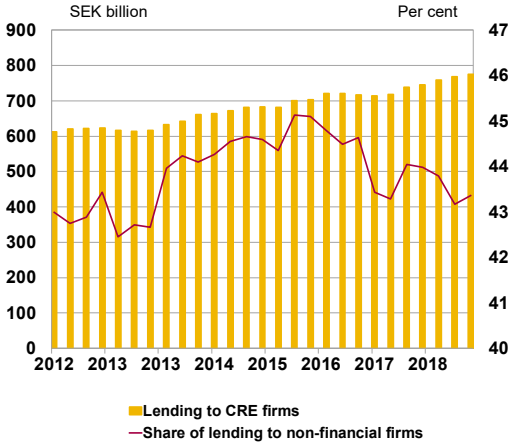
Diagram 22. The Swedish market is large



Source: MSCI

Note: The estimate market value for the part of the CRE market owned by professional investors as a percentage of GDP.

Diagram 23. Banks are highly exposed to the CRE market



Source: FI

Note: Refers to the major banks' lending to CRE firms in Sweden.

The stability of the market financing is also dependent on how the investors' investment needs and strategies develop in general. If unit holders in bond funds want to remove their fund savings at the same time as other bond buyers opt to distribute their investments away from corporate bonds, this would reduce the investment capital that is available for corporate bonds. This could also make it difficult for CRE firms to renew market loans. In this type of scenario, the firms may draw on their approved credit facilities in the bank to finance the repayment of certificates and bonds. If they were to utilise the full amount of their facilities, the banks' total capital requirements would increase by approximately 0.2 per cent, all else equal. If the banks choose to take on the entire volume of the CRE firms' market loans, SEK 146 billion, their capital requirements would increase by 0.5 per cent. FI makes the assessment that these additional capital needs can be handled within the capital buffers the banks voluntarily hold in addition to the formal capital requirements. These so-called management buffers amount to approximately 3.5 per cent of the banks' risk-weighted assets.

As a whole, the financing indicators show elevated risks. This is because the CRE firms' liabilities increased rapidly and are now historically large in relation to net operating income. The high debt means that the CRE firms are sensitive to increases in their financing costs, which makes them vulnerable to shocks to the supply of loans. The fact that a growing portion of loan-based financing is coming from the capital market means that the credit risks in the CRE sector are spread to more market participants than banks. If this relationship endures, it offers desirable diversification that can enhance financial stability. However, it can also give rise to greater refinancing risks for CRE firms if the capital market's investors experience a lower investment need or reduced interest in CRE-related risk.

SPILLOVER EFFECTS

The total market value for CRE in Sweden amounts to approximately 40 per cent of GDP (Diagram 22).[25] This is significantly higher than in other European countries.[26] Given this size and that a significant share of the CRE assets are financed through loans, there is a high degree of interconnectedness to the financial system, and banks and other financial players are highly exposed to the CRE sector. If the risks on the CRE market materialise, this interconnectedness will most likely result in the problems spreading to the financial sector. In order to identify the contagion risks, it is necessary to study the exposures of various financial institutions to the CRE sector.

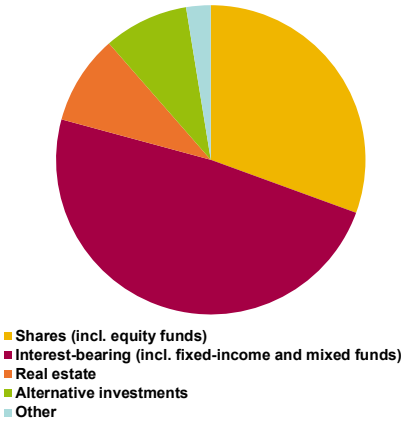
As mentioned in the section above on CRE financing, Swedish banks are highly exposed to the CRE market through their lending to CRE firms, which amounted to SEK 775 billion in Q3 2018 (Diagram 23). This corresponds to more than 43 per cent of the major banks' total lending to non-financial firms in Sweden, and thus constitutes a significant sector concentration.

25 This estimate is based on professional investors' holding of CRE and was made by MSCI, which used the same method for all European countries.

26 The average market value in Europe of CRE owned by professional investors corresponds to approximately 16 per cent of GDP.

Diagram 24. Insurance firms' exposures

Per cent

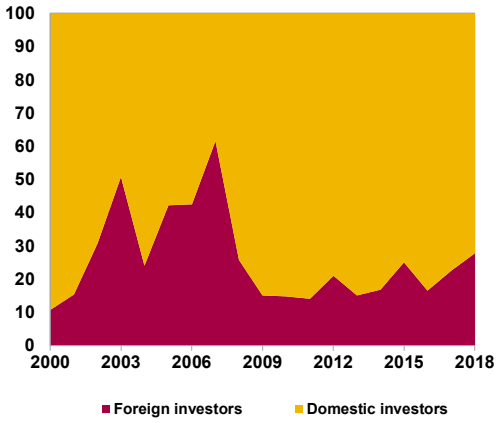


Source: FI

Note: Investments of life insurance companies were classified as at 31 December 2018 by the underlying exposures according to FI's definition.

Diagram 25. Transaction volumes by nationality

Per cent



Source: Pangea

The banks themselves do not hold major posts in CRE, but other financial firms have increased their direct exposure to the CRE market in recent years. Insurance firms' direct holdings of CRE amounted to 9 per cent of their total investments in Q4 2018 (Diagram 24). Swedish and foreign institutional investors have also indirectly increased their investments in CRE by investing in alternative investment funds (AIF) that manage institutional clients' money through direct investments in CRE. The CRE investments of AIFs in Sweden amounted to more than SEK 677 billion in 2018. This represents an increase of roughly 100 per cent since 2015.[27]

Foreign CRE investors have been more active on the Swedish market recently through an increase in CRE acquisitions (Diagram 25). In 2018, foreign investors represented approximately 30 per cent of the total transaction volume.

The overall assessment is that the CRE market is becoming more important for the participants in the financial system. Several participants have increased their exposures to the CRE market, directly through acquisition of physical properties and indirectly through lending to CRE firms by purchasing certificates and bonds. Risk diversification can have a positive impact on the stability of the financial system, but it can also open the door to other types of connections and potential spillover effects, which can pose a risk to financial stability. However, it is the banks' CRE-related lending that will continue to constitute the largest risk exposure that could impact financial stability.

27 These assets refer to physical CRE. Alternative investment funds also invest to some extent in bonds, certificates and shares linked to the CRE market.

Resilience of commercial real estate firms

Strong economic growth, increasing demand for rental premises, good access to capital and low interest rates have led to good profitability in the CRE sector and rising CRE prices. CRE firms have also significantly increased their leverage. A combination of higher borrowing costs, rising vacancies, lower rent levels and restricted access to loan-based funding could place the CRE firms under considerable pressure. FI's calculations and stress tests show that the resilience among CRE firms on average is satisfactory. However, high debt among many of these firms makes them vulnerable, primarily to higher borrowing costs.

CRE firms currently have a good financial position, but several indicators are showing that there are elevated risks on the CRE market. These firms have also taken on more debt in recent years to finance acquisitions of properties and investments in new production. The loans have not only increased in nominal terms but also in relation to the CRE's cash flows. There is a risk that the higher leverage is hidden by the falling loan-to-value ratios in the CRE sector since CRE market values have risen faster than the debt. If CRE market values go down, the financial position of the CRE sector would deteriorate.

The CRE firms' ability to pay the interest rate on their loans is currently good, which is largely due to the historically low interest rates. The situation could take a turn for the worse if market conditions change. If borrowing costs increase – as a result of higher interest rates or higher credit margins – the CRE firms would experience a deterioration in their repayment ability.

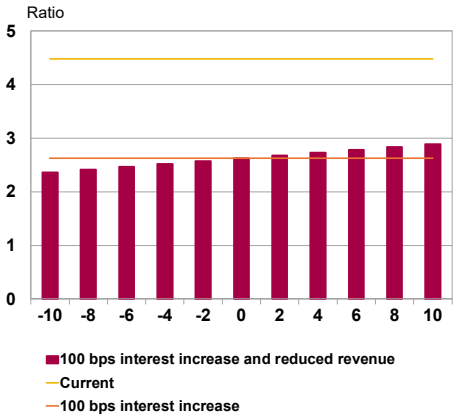
Due to the CRE sector's strong connection to the financial system, problems could spread to banks and other parts of the financial system through an increase in the volume of non-performing loans and credit losses.

CRE FIRMS ARE VULNERABLE TO HIGHER RATES

In order to gain an overview of how sensitive CRE firms are to changes in interest rate expenses and income, FI analyses the CRE firms' interest rate coverage and loan-to-value ratio following shocks.[28] The interest coverage ratio is a measure of how well a CRE firm's current net operating income is able to cover the firm's interest expenses. The loan-to-value ratio provides one way to measure how leveraged a CRE firm is in relation to the value of its CRE assets. These two key ratios are defined as follows:

28 These calculations are static and are based on information from the CRE firms' annual reports. The shock to income is assumed to be larger for CRE firms that are not community or residential properties. Occupancy in these two types of real estate is more stable in general over time. However, the changes in the interest rates are assumed to affect all CRE firms in the same way, and the impact is assumed to be realised immediately. This means that the analysis does not take into account any interest rate hedging applied by the firms to reduce their vulnerability to rising interest rates.

Diagram 26. CRE firms sensitive to interest rates



Source: FI

Note: The diagram shows the CRE firms' interest coverage ratio (median) given an interest rate increase of 1 percentage point. The X axis shows how the interest coverage ratio changes if the net operating income were to increase (to the right) or decrease (to the left) at the same time.

$$Interest\ coverage\ ratio = \frac{net\ operating\ income}{interest\ rate\ costs} \quad (1)$$

$$Loan - to - value = \frac{Loan}{Market\ value} = \frac{Debt}{\frac{net\ operating\ income}{Yield\ requirement}} \quad (2)$$

The market value of CRE can be estimated by dividing net operating income by the yield requirement. The yield requirement is defined as the risk-free interest rate plus the risk premium required by investors to invest in CRE. This means that investors' yield requirements are affected by the interest rates, which are closely linked to the risk-free rate.[29] As a result, both the interest coverage ratio and the loan-to-value ratio of CRE firms are affected by changes to income and interest rates.

Sensitivity analysis of changes in interest rate expenses and income

In order to gain an overview of the CRE firms' sensitivity to changes in their costs for loan-based financing, we have estimated their interest coverage ratios given a 1 percentage point increase in their interest rate expenses compared to today (Diagram 26). This type of sensitivity analysis is a static and simplified estimation used to illustrate the effect of one or a few factors. The analysis should not be interpreted as a scenario associated with a certain degree of probability.

FI's calculations show that the interest coverage ratio, all else equal, falls from a multiple of 4.5 to 2.6 if the CRE firms' interest rate expenses increase by 1 percentage point. Even if we add the assumption that the firms' income also increases by up to 10 per cent, for example due to an increase in rent levels, the interest coverage ratio still falls. The negative effect of rising interest expenses is dominant over the effect of higher income. This is because the increase in the expenses in SEK is relatively large even given small changes to the interest rate since CRE firms have high debt. If we instead assume that the firms' rental income decreases by 10 per cent at the same time as interest rates increase, the interest coverage ratio falls even further, to 2.3

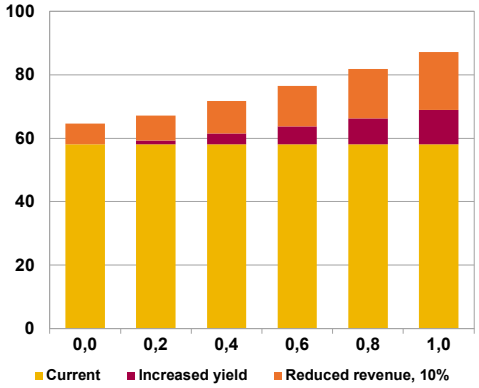
An interest coverage ratio of 2.3 can still be considered satisfactory, but these calculations clearly show that the CRE firms are sensitive to interest rates and that the negative effect of rising interest expenses carries more weight than variations in rental income. The conclusion is that a moderate increase in interest rate expenses could result in a noticeable downturn in the interest coverage ratio, even if the current favourable macroeconomic conditions would remain the same.

An increase in the yield requirements could be the result of higher interest rates, but it could also reflect an assessment by the market participants that CRE investments have become riskier. Regardless of the cause, an upswing in the yield requirements lowers CRE market

29 It is not possible to rule out that higher interest rates apply upward pressure to yield requirements even if the risk premium on CRE investments is historically high at the outset.

Diagram 27. Loan-to-value ratio given rising yield requirements and a decrease in income

Per cent

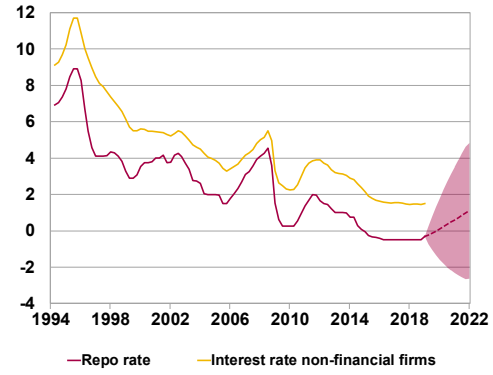


Source: FI

Note: The diagram shows how sensitive the loan-to-value ratio is for changes in the yield and income.

Diagram 28. Repo rate and lending rate to non-financial firms

Per cent



Source: The Riksbank and Statistics Sweden

Note: The dotted line refers to the Riksbank's (April) forecast for the repo rate, and shaded areas show the uncertainty interval (90%) for this forecast.

values and increases the loan-to-value ratio of each property. To illustrate how sensitive the financial position of CRE firms is to increases in the yield requirements, FI calculated the effect of a 1 percentage point increase in the yield requirements (from today's 4 per cent to 5 per cent). The loan-to-value ratios increase by almost 11 percentage points to 69 per cent on average (Diagram 27). If the CRE firms' income were to decrease by 10 per cent at the same time as the yield requirements increase, the average loan-to-value ratio goes up by an additional 18 percentage points to 87 per cent. This is because the CRE market values are also negatively affected by falling operating income (and thus lower expectations of future operating income). Reduced income has a greater impact on market values and loan-to-value ratios the greater the increase in the yield requirement.

STRESS TEST SHOWS MANY CRE FIRMS ARE VULNERABLE

The analyses in the previous section aim to illustrate the CRE firms' sensitivity to specific factors, but they do not comment directly on the firms' ability to withstand shocks and stresses. To investigate resilience, FI conducted an analysis in which we exposed the firms to economic stress. The stress tests analyse how the firms' interest coverage ratio and loan-to-value ratio are affected if the interest rate were to rise or net operating income were to fall sharply. A stressed interest coverage ratio provides an indication of whether the firm could experience problems making their interest rate payments or even become insolvent.

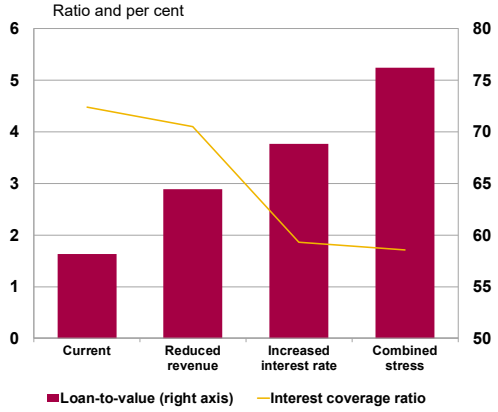
There is no absolute measure for when a firm's interest coverage ratio is so low that it triggers financial problems. If the interest coverage ratio is lower than 1, this means that the firms' net operating income is not large enough to cover the current interest rate expenses.[30] This is therefore an indication that the firm has limited financial manoeuvrability, but it does not necessarily mean that the firm will not be able make its interest payments. Approximately 20 per cent of the CRE firms that are included in FI's data have an interest coverage ratio of less than 1 at the outset. Many of these firms have good solvency – in terms of a low loan-to-value ratio – and cash liquidity. This means that the firms would be able to release or obtain funds that give them sufficient repayment ability despite low net operating income. However, if a CRE firm shows both a low interest coverage ratio and a high loan-to-value ratio, the firm could be vulnerable to shocks. In FI's stress tests, we consider the debt volume of CRE firms which under stress shows both a low interest coverage ratio and a high loan-to-value ratio to be an indicator of elevated credit risk for the CRE sector's lenders.

In the sensitivity analysis above, we calculated the effect if the interest expense is 1 percentage point higher than at the outset. In practice, this means an interest rate expense for CRE firms of around 2.5 per cent on average. This corresponds to approximately the bank lending rate that non-financial firms paid in 2014 (Diagram 28) and can hardly be

30 Such a low interest coverage ratio can be assumed to be a signal that the firm may be financially stressed. Other high values have also been used to capture early signals of possible problems (see, for example, Chow, J. (2015), "Stress Testing Corporate Balance Sheets in Emerging Economies". IMF Working Paper WP/15/216).

Diagram 29. Interest coverage ratio and loan-to-value ratio, median

Ratio and per cent



Source: FI

Note: The upswing in the interest rate is assumed to result in an increase to the yield requirement of 1 percentage point.

viewed as high from a longer-term perspective. If we instead assume that the short-term rate follows the Riksbank's current repo rate forecast, the lending rate to the firms will rise even more. In an unfavourable scenario, rental income could also fall more than what is assumed in the sensitivity analysis above.

In this section, we analyse the CRE firms' resilience to the following three negative scenarios:

- **Reduced income**. In this scenario, the firms' net operating income is assumed to fall by 15 per cent. This is less than the fall in rent levels at the beginning of the 1990s (Diagram 5). For firms whose real estate holdings consist primarily of residential and community service properties, we assume that the net operating income decreases by 5 per cent. The reason for this is that the occupancy of residential and community properties as a rule is more stable than the occupancy of office properties.
- **Increase in interest rate**. In this scenario, the firms' average interest rate expense increases by 2 percentage points (from 1.5 to 3.5 per cent). This is not a high interest rate from a historical perspective. In addition, this upswing in the interest rate fits the Riksbank's uncertainty interval related to the repo rate curve (Diagram 28).
- **Combined stress**. In this scenario, the two scenarios above are combined. It has not been very common for income to decrease at the same time as general interest rates increase. However, in earlier recessions, firms often needed to pay higher credit risk margins for loans as a result of the increase in bankruptcy risks and that lenders became less willing to take on risk. This means that this could occur during a future financial crisis.

The calculations in these stress tests offer a simplified view of the effects. The firms are assumed to be immediately affected by the changes. The analysis does not take into consideration the firms' potential interest rate hedges or other measure that could reduce vulnerability.

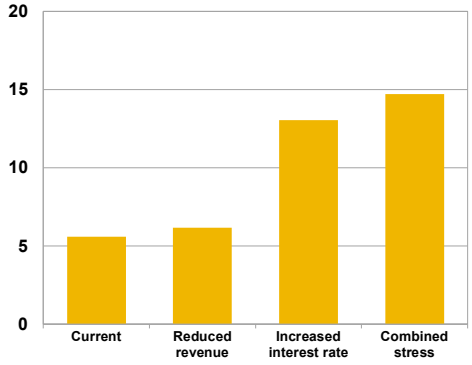
In the scenario with reduced income, the CRE firms' average interest coverage ratio goes down from 4.5 to 4.1. This is a relatively small effect. However, the impact on the CRE firms' loan-to-value ratios is larger. Because CRE values are affected by current and future rental income, the average loan-to-value ratios will increase to approximately 64 per cent due to falling CRE values (Diagram 29).

In the scenario with an increase in the interest rate, the average interest rate expense increases to 3.5 per cent for the CRE firms. The interest coverage ratio falls sharply in this scenario to an average of 1.9. The loan-to-value ratios also increase. This is because we assume that the yield requirements will increase with the interest rates, even if at a slightly lower pace.[31] This means lower market values and higher loan-to-value ratios.

31 We have assumed an elasticity of 0.5 between the interest rate and the yield requirement.

Diagram 30. Percentage of debt with elevated credit risk

Per cent



Source: FI

Note: The "percentage of debt with elevated credit risk" refers to debt at firms with an interest coverage ratio less than 1 and a loan-to-value ratio above 70 per cent. The debt refers to CRE firms' total debt, i.e. bank loans, market financing and other debt. "Combined stress" refers to the combination of stressed revenue and stressed interest rates. The upswing in the interest rate is also assumed to entail an increase to the yield requirement of 1 percentage point.

In the combined stress, where firms experience lower rental income, higher interest expenses and higher yield requirements, the interest coverage ratio falls even further, and the loan-to-value ratio rises even more.

Given the outcome of the stress tests, some CRE firms will experience an interest coverage ratio that is so low and a loan-to-value ratio that is so high that their debt could constitute an elevated credit risk for lenders. FI defines elevated credit risk in these stress tests as a combination of an interest coverage ratio of less than 1 and a loan-to-value ratio of more than 70 per cent. The percentage of corporate debt with these characteristics can be viewed as an indicator of elevated credit risk in the CRE sector.

At the outset, the CRE firms with both a low interest coverage ratio (below 1) and high loan-to-value ratio (above 70 per cent) represent around 5.6 per cent of total corporate debt (Diagram 30) This is in line with the internal classifications that banks make in their accounts. Approximately 5 per cent of the lending to CRE firms is classified as Stage II exposures, which means elevated credit risk.

In the scenario with reduced income, the share of debt with elevated credit risk increases relatively little. However, significantly more CRE firms are affected by an interest rate increase since many firms get an interest coverage ratio below 1. The debt of firms with both a low interest coverage ratio and a high loan-to-value ratio constitutes more than 13 per cent of total debt when interest rates rise.

In the combined stress test, where the firms experience reduced income, higher interest rate expenses and higher yield requirements, the debt with elevated credit risk increases to almost 15 per cent of the total debt of the CRE firms.

The stress tests show a significant upswing in the share of debt with elevated credit risk as defined by FI, but the results should be interpreted with some caution. The impact of a deterioration in the financial key ratios could vary between different financial firms depending on factors that cannot be captured in this analysis. CRE firms' ability to implement measures as needed to strengthen their creditworthiness, as well as the structure of their real estate portfolios, could make a big difference in terms of how banks choose to react to elevated credit risk. In particular, it is very important how the lender views the long-term values in the real estate pledged as collateral for the loans.

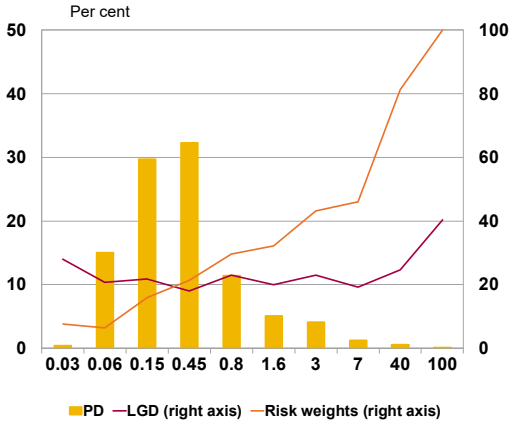
As a whole, FI's analysis shows that the resilience of CRE firms is relatively good. The firms' interest coverage ratios are high on average, and their loan-to-value ratios are low. However, the fact that many CRE firms have high debt makes them vulnerable to rising interest rates and falling CRE values. For the CRE firms' current profit and their ability to make interest rate payments, the primary risk factor is high borrowing costs. These costs could increase as a result of an increase in the interest rate level in general, which would mean higher short-term rates, or because banks or bond investors require higher credit margins for their lending. If borrowing costs rise at the same time as rental income falls, CRE firms could be placed under considerable pressure. These problems could trigger payment difficulties and defaults for CRE firms and credit losses for the

lenders. If the supply of loan-based financing would also shrink, this would also further restrict the CRE firms' financial freedom, making an already difficult situation even more difficult. In the long run, this could affect the stability of the financial system.

Impact on banks and financial stability

Problems on the CRE market could result in credit losses for the banks. FI's stress tests indicate that the share of CRE firms' liabilities that are associated with elevated credit risks could increase substantially in a stressed scenario. This could lead to credit losses that are larger than the capital the banks hold for anticipated credit losses in their lending to CRE. Therefore, FI sees a need for the banks to hold more capital to cover the risks in their lending.

Diagram 31. Lending to CRE firms by PD



Source: Finansinspektionen

Note: The X axis shows the probability of default in per cent. The Y axis shows the share of the total credit volume, average risk weight and average LGD.

Swedish banks are highly exposed to the CRE sector. Payment problems and insolvency among CRE firms could lead to credit losses for the banks, reducing their capital. A strong deterioration in the banks' financial position could also reduce their ability to lend to other sectors.

VULNERABLE CRE FIRMS AFFECT THE BANKS

Banks grant loans knowing that some customers will not be able to pay back their loan. Some credit losses are expected and can be viewed as a cost for the bank. This cost must be compensated for through the level of the lending rates to customers and covered by provisions for anticipated credit losses.

Sometimes the realised credit losses in a bank deviate from the expected credit losses. The losses can be so large that the provisions the bank made are insufficient. This poses a threat to the bank's solvency. Banks must hold capital to manage the risk that their realised credit losses might exceed the expected amount.

Banks' risk estimation in their lending

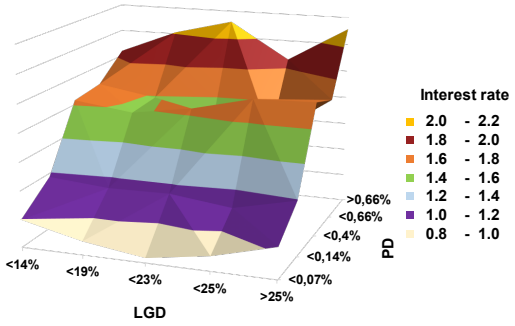
The CRE market in Sweden has not experienced a major shock since the financial crisis at the beginning of the 1990s. Few CRE firms have become insolvent the past ten years. CRE pledged as collateral for loans with the banks have low loan-to-value ratios, which in many cases has slowly continued to decrease in recent years as CRE values have risen. Today, the credit quality in the banks' CRE lending is satisfactory.

When the major banks estimate the credit risk in their lending to CRE firms, they use risk models that they have developed themselves. The capital adequacy regulations allow such models under certain conditions. The banks use these models to estimate, for example, the probability of default (PD), the loss given default (LGD) and risks weights in their lending. The estimates are based largely on the banks' realised credit losses. The prolonged period of few and small credit losses within the CRE sector has led to low estimations of risk in the credit risk models.

According to the banks' risk models, almost 90 per cent of the total credit volume for CRE firms has a PD that does not exceed 0.8 per cent (Diagram 31). The major banks' calculations of PD for their lending to CRE firms vary. However, the banks' LGD estimates vary relatively little for the majority of their exposures. The major banks'

Diagram 32. Risk pricing based on LGD and PD

Per cent



Source: FI

Note: Excluding unidentified firms and microfirms. Microfirms refer to firms with net sales or assets of less than SEK 20 million.

average risk weight is just over 23 per cent, and the median is around 17 per cent. This is significantly lower than the risk weight calculated using the capital adequacy regulations' standardised approach for loans collateralised by CRE.[32]

The standardised approach is used by banks that do not have authorisation to use internal credit risk models. The risk weights in the standardised approach do not change over time, but rather are intended to be conservative enough so banks hold a level of capital over time that is sufficient even when credit losses increase (for example in an economic downturn).

Banks' interest rates reflect their PD estimates

The banks' surcharge should be set in relation to the risks they are taking in their lending. This helps banks ensure that they are generating enough income to maintain their financial strength and ability to carry credit losses over time. From a stability perspective, it is important for the interest rates on loans to be risk-based.[33] According to the banks' own PD and LGD calculations on loans issued in 2018, the lending rates differ primarily with the PD levels (Diagram 32). CRE firms with a PD of more than 0.4 per cent on average pay an interest rate that is 0.6–1 percentage points higher than the interest rate paid by firms with a PD below 0.4 per cent. The relationships indicate that the banks set the price of risk in their lending in such a way as to reflect in general the risk estimate in their own PD calculations.

Are banks sufficiently resilient?

FI estimated in the previous section how high the credit losses could be in the different scenarios of the stress test. The objective is to assess whether the banks have sufficient capital to cover the credit losses that could arise as a result of shocks to the CRE market. The stress tests are partial, and the calculations only show how the CRE firms are affected. However, the scenarios can also stress other sectors in the economy, which could also give rise to additional credit losses and weaker profits for the banks. FI has not considered this in its calculations. FI has also not taken into consideration any risk mitigation measures that the borrower may have taken, for example by having a fixed interest rate.

The credit losses are calculated in the analysis as the increase in the amounts the banks are expected to make provisions for in each of the scenarios in relation to the outset.[34] Loan are classed into three categories:

- unchanged credit risk,
- elevated credit risk, and
- past due credit.

A *past due credit* is when the borrower does not meet its payment commitments to the banks. In the category *unchanged credit risk*, the

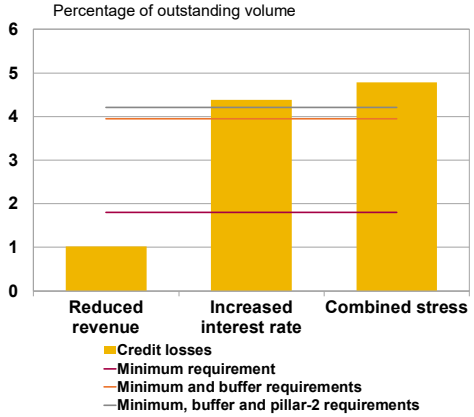
32 The risk weight for exposures collateralised by CRE is currently 100 per cent pursuant to Chapter 4, section 1 of FFFS 2014:12 and Article 124 of the CRR.

33 Where high risk results in a higher price and a low risk results in a lower price.

34 The provisions have been calculated in accordance with the accounting standard IFRS 9.

Diagram 33. Credit losses in FI's stress test and capital buffers

Percentage of outstanding volume



Source: FI.

Note: The diagram shows estimated credit losses in relation to the major banks' capital. The minimum requirement is 8 per cent of risk-weighted assets, the minimum requirement and buffer requirements together amount to 17.5 per cent, while the other Pillar 2 reflects capital requirements attributable to CRE for Handelsbanken, SEB and Swedbank. The banks' capital is calculated by multiplying each requirement by the banks' risk weights for these exposures. The average risk weight amounts to approximately 23 per cent.

provision amount is the expected loss within one year, while the category *elevated credit risk* reflects the lifetime of the loan. In the calculation, we used the banks' own provision ratios for loans in each category. We assume that counterparties with an interest coverage ratio of less than 1 and a loan-to-value ratio of more than 70 per cent constitute an elevated credit risk, while firms with an interest coverage ratio of less than 1 and a loan-to-value ratio of more than 100 per cent default.[35]

At the outset, 7 per cent of the banks' lending to CRE firms consisted of loans with elevated credit risk including loans in default (Table 2). In the scenario with reduced income, this share is estimated to increase to around 12 per cent. In the scenario with higher interest rates, FI's calculations find that the share of loans with elevated credit risk and loans in default is 22 per cent. When the stresses are combined, these loans are estimated to amount to approximately 24 per cent. According to FI's calculations, significantly more loans are classified as past due credits in these scenarios. This is because the interest coverage ratio falls sharply if interest rates rise, and firms with low interest coverage ratios on average have a higher loan-to-value ratio. Therefore, many firms with an interest coverage ratio below 1 also experience a loan-to-value ratio of more than 100 under stressed conditions.

The size of the credit losses in the banks in these scenarios depends on the increase in the need for provisions. In FI's stress tests, credit losses are primarily driven by defaulted loans since the provision ratio for this loan category is significantly higher than for loans with elevated credit risk (Table 2). [36]

Table 2. Bank loans by type of credit risk and applied provision ratio

	Outset	Reduced income	Interest rate increase	Combined stress	Provision ratio
Unchanged	93.0	87.7	78.0	75.7	0.0
Elevated	6.9	9.3	8.1	9.1	0.5
Past due	0.1	3.0	13.9	15.2	31.1
Total	100.0	100.0	100.0	100.0	

Source: FI

Note: The table shows the share of bank loans by each risk type at the outset and after the stress in relation to the total lending to CRE firms. The table also shows the average provision ratio applied by the banks for each risk type.

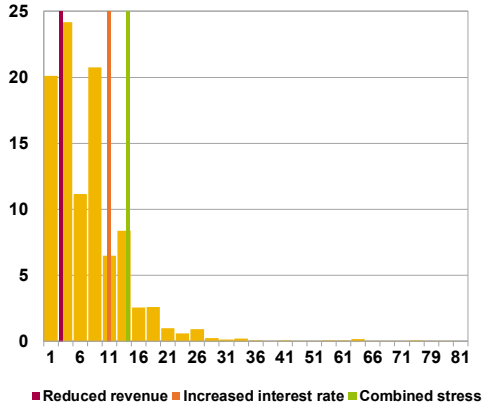
In the scenario with only reduced income, the analysis indicates that the credit losses are just under 1 per cent of the exposures (Diagram 33). In the scenario with only an increase in the interest rate, the credit

35 According to IFRS 9, the assessment of whether the credit risk is elevated or not is made in relation to what the credit risk was at the time the loan was issued. It is therefore naturally possible that loans were granted to the firms with these conditions, but FI makes the assessment that this is a reasonable indicator for the purpose.

36 It is probable that the banks' reserve rates are higher under stressed conditions. This would mean greater losses than in these calculations.

Diagram 34. Stressed PDs compared to the share of past due credits

Per cent

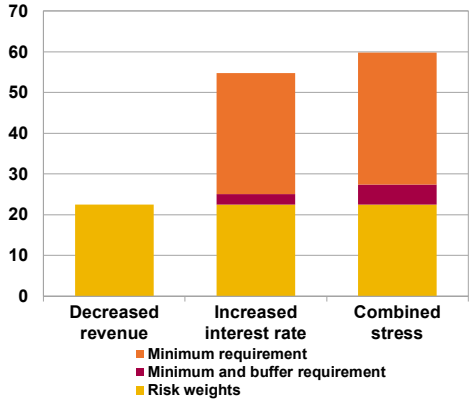


Source: FI

Note: The diagram shows the banks own estimates of PD given a substantial stress in accordance with the risk weight formula for the IRB approach together with past due credits in FI's stress test.

Diagram 35. Implicit risk weights to cover credit losses in FI's stress test

Per cent



Source: FI

Note: The diagram shows implicit risk weights, i.e. the risk weights that on average are required for the capital requirements to cover credit losses in each scenario.

losses are 4.4 per cent; in the combined scenario, they are 4.8 per cent. Expressed as an amount, the analysis indicates that the credit losses in the scenario with the increase in the interest rate and the combined stress amount to SEK 35–40 billion.[37]

It should be emphasised that stress tests are always simplified analyses, and they are dependent on the assumptions and definitions applied during the test. The results should therefore be interpreted with caution. The microbased stress test in this analysis is illustrative for assessing the banks' resilience in the event of a shock to the CRE market. However, FI also uses other macrobased stress tests to estimate credit losses given negative scenarios.[38]

The ability of the banks to absorb credit losses is dependent on their capital. Diagram 33 compares the losses according to the microbased stress tests to the capital the banks hold for credit risks in their CRE lending.[39] In the comparison, we define the capital coverage requirement as having three levels: the minimum requirement according to the capital adequacy regulations, the sum of the minimum requirement and the buffer requirements, and the sum of the minimum requirements, buffer requirements and the Pillar 2 requirements attributable to credit risks in CRE. Even with the broadest definition of capital, the banks hold less capital for the risks in their lending to CRE firms than the credit losses that arise in the scenario where the interest rate increases and the combined stress scenario (Diagram 33).

One main reason for why the banks hold less capital than the credit losses that arise in these scenarios is that the banks use a lower PD. In Diagram 34, we compare the share of past due credits in each scenario with the PD values in the presence of stress using the banks' own estimates.[40] The share of past due credits is higher in FI's calculations than the average for the banks' own calculations in the scenario with an increase in the interest rate and the combined scenario.

The capital the banks hold to cover the loss risks is calculated using the capital requirements determined by the banks' estimated risk weights for CRE lending. The average risk weights for these exposures is around 23 per cent. To cover the estimated credit losses in FI's stress tests, the banks' risk weights for lending to CRE firms must be higher (Diagram 35). If these credit losses would only be covered by the minimum capital requirement, the risk weights would need to increase to on average 54 and 60 per cent, respectively, for the scenario with the increase in the interest rate and the combined scenario. The average increase in the risk weights does not need to be as large, assuming that both the minimum requirement and the buffer requirements can be considered to cover the losses.

37 The losses are based on the banks' total exposures to CRE firms, which amounts to approximately SEK 775 billion.

38 For more information, see Stability in the Financial System, November 2018, FI.

39 The capital the banks hold is calculated using the capital requirements determined by the banks' estimated risk weights for CRE lending.

40 Stressed PD is calculated by adjusting the banks' own PD estimates for a substantial stress in accordance with the risk weight formula for the IRB approach (see also Basel Committee on Banking Supervision (2005) "An explanatory note on the Basel II IRB risk weight functions". Bank for International Settlements, Basel, Switzerland).

FI's stress tests indicate overall that the banks currently hold less capital for CRE-related credit risks than the credit losses that could occur in the CRE sector given major shocks.

FI INTENDS TO REQUIRE THAT BANKS BECOME MORE RESILIENT

FI has been tasked with safeguarding the stability of the financial system. This report aims to investigate how the CRE market could affect financial stability.

The banks need more capital to cover risks in their lending to the CRE sector.

FI's analysis indicates that there are elevated risks in the CRE market. A prolonged period of strong economic growth, good access to capital, and low interest rates have contributed to good profitability in the real estate sector and a rapid increase in CRE prices in Sweden. CRE firms have also significantly increased their debt. Many CRE firms currently have good resilience to shocks, but their high debt makes them vulnerable to shocks or a deterioration in the macroeconomic conditions. Major problems on the CRE market could give rise to credit losses at the banks that exceed the capital they hold for CRE exposures.

FI takes the position that the banks should hold enough capital in each segment to manage the credit losses that could arise in a crisis. This helps create sound incentives for the banks in their lending to the sector, prevent the sector from borrowing at unsound, low interest rates, and increase the resilience in the banking sector.

This analysis indicates that the banks are underestimating the risk in their lending to the CRE sector and therefore are not setting aside enough capital to cover these loss risks. In its report *Stability in the Financial System*, May 2019, FI presents its overall assessment of the risks associated with banks' commercial real estate lending. FI believes that the banks do not set aside enough capital to cover the loss risks in this lending. FI therefore sees a need to take action in 2019 to ensure that the banks are holding capital already in the shorter term that fully covers risks associated with lending to CRE firms. FI will conduct a more in-depth analysis of how much the capital requirement should be increased to meet the loss risks in commercial real estate lending. It is FI's preliminary assessment that the risks weights in the banks' lending to CRE firms should be at least 30 per cent. Today, corresponding risk weights are at around 23 per cent.

Following the analysis of the capital need, FI intends in the autumn of 2019 to decide on a measure that will require banks to hold capital that covers the risks associated with lending to CRE firms.

Satisfactory resilience in the banking system as a whole

FI does not consider the banks' low provisions for capital to cover their lending to CRE firms to be a threat to financial stability. Firstly, the direct macroeconomic contagion effects from the CRE market would probably be limited. The CRE sector does not make up a large part of the total added value in Sweden. FI therefore makes the assessment that the development on this market alone would not have a significant influence on the macroeconomy. Thus, the indirect contagion effects for financial stability would also be limited.

Secondly, FI considers the banks' total capital buffers to be sufficient for covering both the losses that could arise in the CRE sector and other lending in a severe scenario. It is, however, conceivable that other sectors in the economy would be affected at the same time as the CRE market by a deterioration in the macroeconomic conditions. This could give rise to credit losses in addition to the losses in the CRE lending. However, according to FI's calculations, the banks have enough capital to absorb this type of combined losses in their loan portfolios. This is evident by adding the losses from CRE lending according to the microbased stress test in this report with the losses in other sectors estimated by FI's macrobased stress test.

Appendix – Glossary

Default: A situation where a borrower cannot make contractual interest rate payments or amortisation payments on a loan.

Net operating income: Rental income minus operating expenses.

Interest coverage ratio: Net operating income divided by interest expenses. A measure of how well the net operating income covers the interest expenses.

Institutional CRE firm: A CRE firm that is owned by a pension or insurance firm.

IRB approach: Internal ratings-based approach. A method for calculating the capital requirement for credit risk.

LGD: Loss Given Default.

Loan-to-value ratio: Defined as total loans in relation to the value of the property.

Loans to the public: Swedish banks' total lending to households, non-profit organisations and non-financial firms.

NPL: Non-performing loan.

PD: Probability of Default. A situation where a borrower cannot make contractual interest rate payments or amortisation payments on a loan.

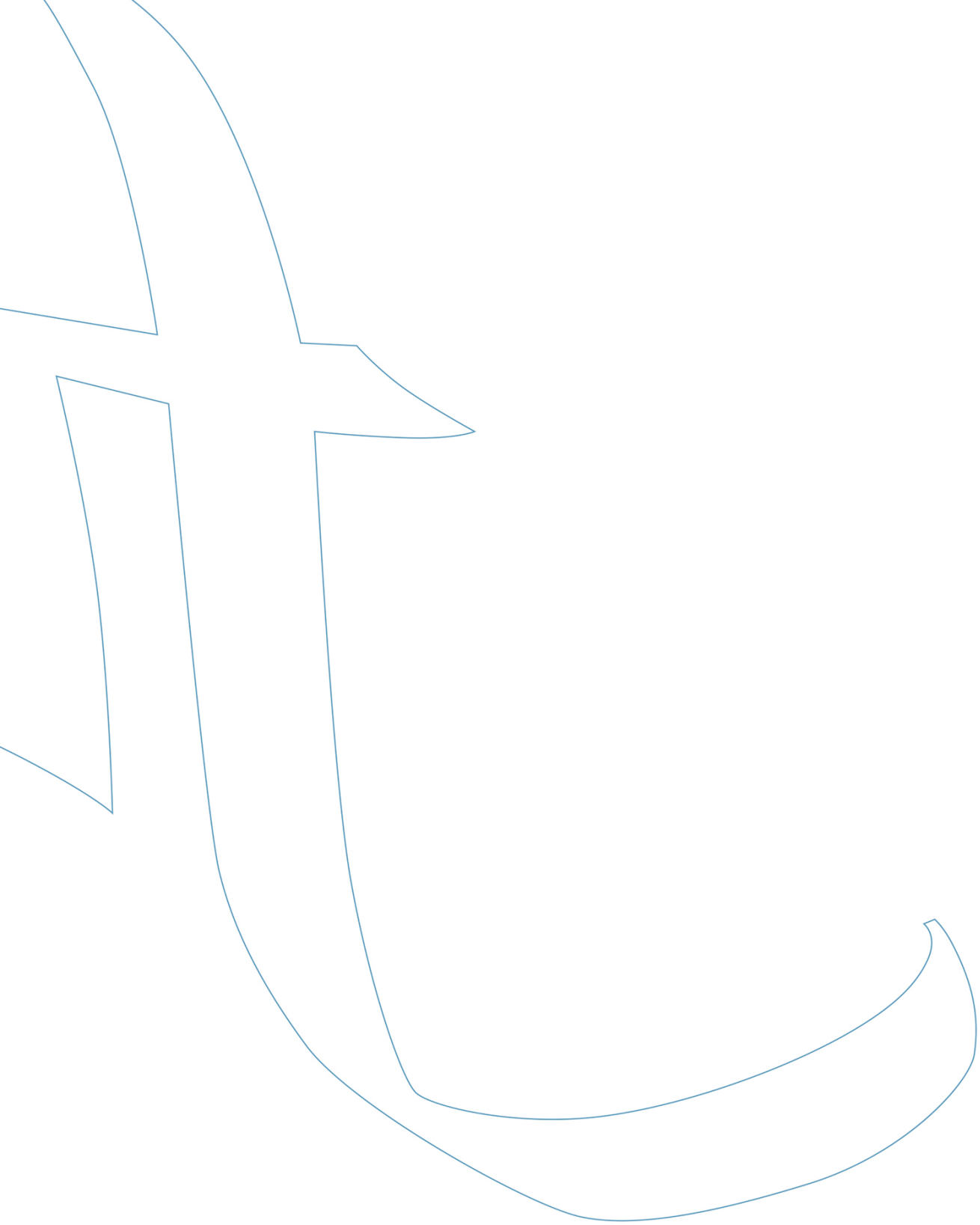
Risk weight: Can be described in simplified terms as a percentage showing the risk level in a credit exposure. The risk weight for an exposure is used to calculate the risk-weighted asset.

REA: Risk exposure amount.

Vacancy rate: The difference between potential rentals and actual rentals in terms of rental income for a property or CRE firm.

Yield: A property's net operating income in relation to its value.

Yield requirement: Assessment of the yield requirements of an investor to invest in a property or market. The requirement reflects risk and the expectation of the future value of the investment. The direct yield requirement is also applied to the estimated income from the property when establishing the market value.



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