

STAFF MEMO

Bank lending to the commercial real estate sector—a source of systemic risk?

NO. 11 | 2018

Marius Hagen, Ida Nervik Hjelseth, Haakon Solheim and Bjørn Helge Vatne, Financial stability, Norges Bank



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BANK LENDING TO THE
COMMERCIAL REAL ESTATE
SECTOR—A SOURCE OF
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Bank lending to the commercial real estate sector

– a source of systemic risk? *

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Banks' commercial real estate loans account for almost half of banks' total loans to non-financial enterprises. Losses on these loans are normally low in good times, but they have proved to be one of the largest sources of bank losses in financial crises. As there is often a mismatch between the maturity of a bank's commercial real estate loan and the lifetime of a property, there is a risk that banks do not adequately price in losses on commercial real estate loans incurred during crises. This article further argues that financial risk is particularly high in the office segment. Prices in Oslo are currently elevated, vacancy rates are low and construction in recent years has been limited. Structural factors are restraining speculative construction. A tight market on the supply side may contribute to reducing the risk of a substantial price adjustment even if yields should rise.

1 Introduction

Commercial real estate (CRE) companies own and manage properties such as office or retail space, hotels and logistics facilities. Compared with other sectors, CRE sector debt is high relative to both operating revenue and earnings¹ (see box on next page for a description of how commercial real estate is defined).

Banks are by far the most important source of external financing², although bond debt has played a more important role in recent years. CRE lending is also important to banks. CRE loans account for almost half of the stock of bank lending to non-financial enterprises.

As commercial real estate has historically been a main source of problems for banks during financial crises, it is important to understand when risk builds up in the CRE market. Commercial real estate prices have risen sharply in Oslo in recent years. As crises in the past have often occurred following periods of high commercial real estate price inflation, it is particularly important to monitor the CRE market now. This article discusses the risks posed by the commercial real estate market, possible sources of systemic risk in this market and some current market trends.

*Views and conclusions expressed in this article are our own and should not be taken to represent the views of Norges Bank. We would like to thank Henrik Borchgrevink, Nina Midthjell Larsson and Torbjørn Hægeland for useful comments and input.

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¹Earnings are defined as ordinary profit before tax.

²At the end of 2017, bank loans accounted for 88 percent and bond debt 12 percent of external financing. In 2013, the share of bond debt was 4 percent.

Commercial real estate

Commercial real estate is classified in the national accounts under "Real estate activities". The sector comprises three subgroups:

- Buying and selling of own real estate
- Renting and operating of own or leased real estate
- Real estate activities on a fee or contract basis

The CRE sector is dominated by the leasing of properties such as office or retail space, hotels and logistics premises. As most property companies own the buildings that are leased out, the CRE sector is capital-intensive. Direct output^a for the CRE sector in 2017 accounted for about 4 percent of total mainland output and more than 40 percent of the total bank and bond debt of non-financial enterprises.

^aOutput in the leasing segment will be dominated by the estimated rental value of the space.

2 Risk factors in the commercial real estate market

There are generally two types of risk that can bankrupt a company:

- Liquidity risk: A company is not able to pay running expenses
- Solvency risk: A company has negative equity

Owing to a combination of a high debt ratio, high capital intensity and property leasing, the income statements of CRE companies are dominated by (i) rental income, (ii) interest payments and (iii) changes in property values. A fall in rental income and/or higher interest payments will put pressure on the liquidity of these companies. If income falls at a certain interest rate level, flexibility in expenditure will be constrained by the high debt ratio. Write-downs, normally as a result of changes in property values, can cause substantial profit volatility. In the event of a sharp price fall, write-downs could potentially wipe out a firm's equity (see box on page 11 for further details). As these companies are often limited liability companies, shareholders will have sound reasons to assess the basis for continued operation. Finally, there is risk associated with debt refinancing. This type of risk can be particularly critical for commercial real estate as the debt ratio is high in this sector and loan agreements are often short compared with the lifetime of the property.

Interest rate risk

Prior to the financial crisis, CRE debt grew more rapidly than operating revenue. The debt-to-revenue ratio has since remained stable at a higher level. Owing to high debt levels in this sector, CRE companies are sensitive to interest rate increases. Analyses conducted by Norges Bank show that a 1 percentage point interest rate increase would have weakened the earnings of CRE companies

in 2017 to the same extent as a three percent fall in operating revenue (Chart 1a, see also Norges Bank (2018)). For non-CRE sectors, a 1 percentage point interest rate increase only represents 0.1 percent of operating revenue.

Enterprises with weak earnings are particularly sensitive to interest rate increases. Consolidated financial statements data³ show that the share of CRE debt that was in CRE corporate groups with negative earnings has, on average, been slightly more than 20 percent (Chart 1b). The chart shows that the share of debt increases somewhat with interest rate increases of 1.0 and 2.5 percentage points. The increase becomes substantial when the interest rate is increased by 5 percentage points. Since debt has risen, CRE companies are now considerably more sensitive to substantial rises in interest rates than in the early 2000s.

Interest rate sensitivity must be assessed in the light of industry-specific factors, such as the level of average operating margins, the extent of fixed-rate borrowing and the scope for price adjustments. Commercial real estate leases are typically long term and companies often opt for a fixed rate on some of their debt for the terms of these lease agreements. In terms of volume, about half of the bonds issued by CRE companies in recent years have been fixed rate bonds (Chart 1c), and volume-weighted average maturity has varied between six and nine years.

Operating margins in the CRE sector are typically high in normal times. CRE companies may therefore be less vulnerable to interest rate increases than their high debt ratios would imply. With the current solid earnings in this sector, most CRE companies would likely have the capacity to adjust to a moderate increase in interest rates. However, if interest rates rise markedly and revenue falls, the risk of losses will increase substantially.

Risks associated with different types of property

The CRE market is dominated by firms leasing office or retail space, hotels and logistics premises. As the various segments differ, credit risk will also vary.

A substantial share of banks' exposure to the CRE market is to the office segment. Purchases and sales of office space normally account for a large share of the total volume of CRE transactions, and market values are relatively high since a sizeable share of the stock of office buildings is located in the cities (Akershus Eiendom AS (2018) and Hagen (2016)). Many of these buildings are in Oslo. According to private analysts, there is 50 percent more office space in Oslo than in Bergen, Trondheim and Stavanger combined. DNB has the highest share of the CRE lending market, at around 25 percent (Hagen (2016)). Office property accounts for about half of DNB's exposure to commercial real estate (DNB Group (2018)).

Much of the office property market is not owner-occupied, and the renter's identity or brand is not normally associated with the building. Office property ownership is diverse, with a substantial share of financial investors, particularly in the city centres (Folketrygdfondet (2014)).

Office rental rates are set when the lease agreement is signed and are only adjusted to market rates when a new agreement is signed. Once a lease agreement has been finalised, the landlord will normally receive a reliable income in the lease period. Risk during the lease period is the risk of the

³Since debt and earnings for complex corporate group structures are split among several companies, we use financial statements showing the corporate group as a whole in exercises using information for individual companies.

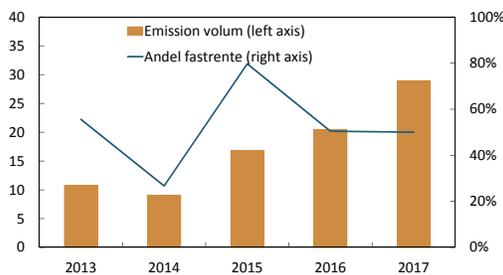
Chart 1

(a) Net increase in interest expenses with a 1 percentage point increase in interest rates as a share of operating revenue. Percent. 2000 - 2017



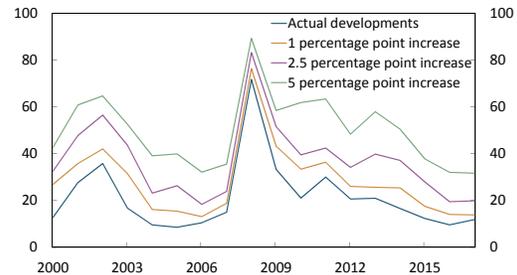
Source: Norges Bank

(c) Volume of bonds issued by CRE companies in the Norwegian bond market and the share issued at a fixed rate. In billions of NOK and as a percentage. 2013 - 2017



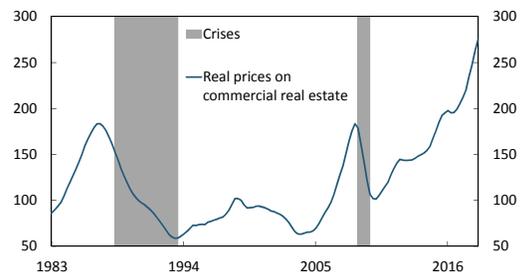
Source: Stamdata

(b) Share of debt in group companies in the CRE sector with negative earnings in the event of different interest rate increases. Percent. 2000 - 2017



Source: Norges Bank

(d) Real commercial real estate prices.¹ Index. 1998=100. 1983 Q1 - 2018 Q2



1) Estimated real selling prices per square metre for prime office space in Oslo. Deflated by the GDP deflator for mainland Norway. Average selling price for the past four quarters.
Sources: CBRE, Dagens Næringsliv, OPAK, Statistics Norway and Norges Bank

renter's bankruptcy. When the lease expires, risk will be associated with developments in market rental rates and vacancy rates. Rents in new leases are usually sensitive to the business cycle and relatively closely correlated with developments in employment. Companies with a varied lease length profile will be less vulnerable to falls in rents and higher vacancy rates. Centrally located properties are normally attractive because the risk of vacancy is low and these properties are perceived as highly liquid.

Retail leasing is a large segment that includes shopping centres, large shops and retail premises in a property leased to a variety of renters. Ownership of shopping centres is concentrated, and a few investors own a substantial share of the total value of the property in this segment. For other retail leasing, ownership is more diverse (Folketrygdfondet (2014)). Retail leasing agreements differ from office leases in that the rent is often linked to the renter's turnover, although a minimum rent

is usually specified (Investing in Norway (2018)). Turnover volatility can therefore directly affect the owner's rental income. At the same time, it provides a buffer for the renter, reducing the probability of bankruptcy.

Compared with the office segment, both owners and renters in the retail segment are more likely to remain in the same property. It often takes time for retailers to gain a foothold. If they relocate, there is a risk of losing customers temporarily. Owner and renter will therefore likely be more closely connected than is normally the case in the office segment. Retail property owners are more likely to be industrial investors than office property owners, who will normally be more focused on actively managing and developing the property.

Recent years have seen strong growth in online retailing (Halvorsen (2018)). Retail chains such as Enklere Liv, Tilbords and Habitat have gone bankrupt. Many other well-known chains, such as Nille, Jernia and Power, have run into difficulties (UNION (2018b)). As a result of the sharp rise in online retailing, other retail chains could over time encounter difficulties and reduce demand for retail space. This could lead to a marked fall in market rental rates for retail premises. Even though this is a trend that should be expected by lenders and already priced into the mortgage contract, there is a risk that the decline in the retail trade sector will be more pronounced and lenders' losses larger than they expect.

Ownership in the hotel segment is dominated by a small number of investors. As in the retail segment, rents are often turnover-based subject to a lower limit (Investing in Norway (2018)). A few companies operate most of the hotels in Norway. In many cases, these operators also own the property.

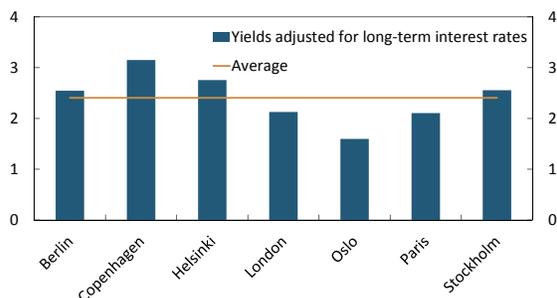
Relocating a hotel involves substantial costs, and considerable brand value is gained from remaining in the same property through downturns. As both renter and owner are likely to have a more long-term perspective than in the office segment, the owner may be more interested in retaining the property through bad times. This may reduce the risk of lending to the hotel segment. At the same time, with a turnover-based rent, rental income will fluctuate to a greater extent. In addition, owing to concentrated ownership in this segment, concentration risk is high.

There are usually relatively few renters in large logistics premises, normally with large leases (UNION (2018b)). Logistics premises are to a great extent located alongside motorways in areas outside Oslo. Easier access to land than in the cities and short construction periods have contributed to keeping rents low. Warehouse and combination properties are typically rented by smaller companies. Growth in online retailing has resulted in higher demand for buildings for warehousing and distribution.

In our overall assessment, risk is highest in the office segment because of the high percentage of financial investors in this segment and because owners and renters are less closely connected. In addition, banks are likely highly exposed to the office segment. Other types of commercial real estate are owned to a greater extent by industrial companies, which will probably dampen the systemic risk associated with vulnerability in periods of sharply falling property prices, as these companies invest with a view to longer-term management and ownership. At the same time, the strong growth in online retailing may generate challenges for commercial real estate further ahead, and concentration risk is high in the shopping centre and hotel segments.

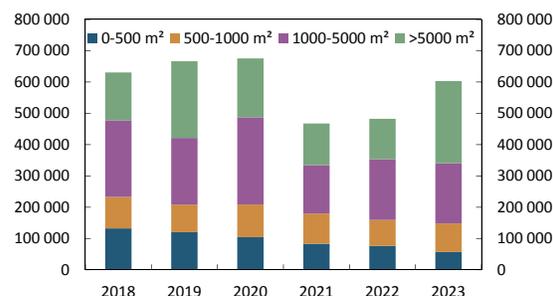
Chart 2

(a) Yields on prime office space in Oslo less long-term interest rates¹. Percent. 2000 Q1 - 2018 Q2



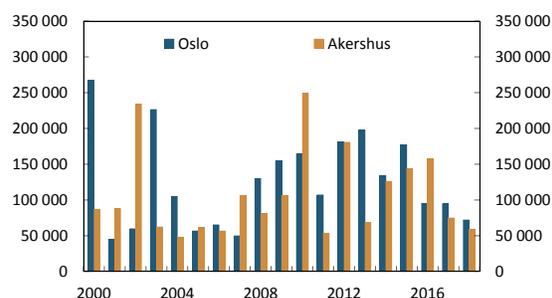
1) Ten-year government bond yields.
Sources: CBRE, OECD and Norges Bank

(c) Completed commercial buildings¹ in Oslo and Akershus. In square metres. 2000 - 2018²



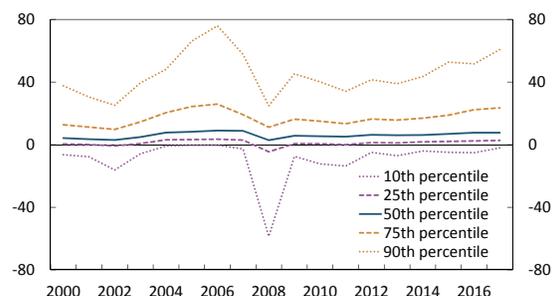
1) Provided the following buildings are used for commercial purposes: office buildings, business premises, restaurants and buildings for overnight accommodation.
2) For 2018, square metres built by end-Q3
Source: Statistics Norway

(b) Yields on prime office space in European cities less long-term interest rates¹. Percent. 2018 Q2



1) Ten-year government bond yields.
Sources: CBRE, OECD and Norges Bank

(d) Office lease agreements due to expire, by size. In square metres. At 2018 Q3



Source: Area statistics

Risk of price falls

Commercial real estate ownership is usually in the form of limited companies. Property is most often bought and sold as shares in these companies rather than in the form of the property itself. Commercial real estate sales are therefore not registered in the same way as residential property sales. Hence, there are no selling price indices specifically for commercial real estate. Transaction volumes for office space are high compared with the other segments, and a number of market participants produce forecasts for CRE yields in the office segment in Oslo. Implied selling prices can be estimated by dividing rental income at current market rates by the required rate of return (see Hagen (2016) for a detailed description). As detailed price statistics are not available, relatively little is known about developments in selling prices for hotels and large retail and logistics buildings. The remainder of this section will therefore primarily focus on the risk of corrections in selling prices for office buildings.

In the historical experience of Norway and other countries, prices for office buildings have often risen substantially prior to a sharp fall. When a rapid rise in prices coincides with an increase in

bank lending to the CRE sector, the credit risk associated with bank lending to CRE companies can increase.

Selling prices for office property in Oslo have risen markedly over the past decade (see Chart 1d). Credit growth has also been fairly high (Norges Bank (2018)). This increases the risk of a fall in selling prices if the interest rate level rises or demand for office space falls. In recent years, however, banks have raised the equity capital requirement for loans secured on office property in central Oslo (UNION (2018b)), moderating the credit risk associated with these loans.

Historically, yields have been close to the long-term interest rate level in pre-crisis periods. In the years prior to the financial crisis, yields fell in a number of European cities, while long interest rates were fairly stable (Hagen and Hansen (2018)). This indicates that the risk premium decreased, gradually falling to a low level. When the risk premium is repriced back to more normal levels, selling prices will fall. The spread between yields returned by the office segment and long interest rates is now somewhat below the average since the turn of the millennium (Chart 1d). In 2018 Q2, yields relative to the interest rate level in Oslo were lower than in other European cities (Chart 2b). This may suggest that the risk premium is relatively low in Oslo.

Another risk factor is an abrupt decline in rent expectations. Selling prices will rise when investors' rent expectations rise. A change in expectations can result in a marked fall in prices. Rent expectations in European cities have historically been influenced by the actual increase in rents (Hagen and Hansen (2018)). In periods of rapidly rising rents, expectations have also risen. Higher rent expectations were likely one of the factors behind the marked rise in prices prior to the financial crisis. Rents in Oslo have risen rapidly over the past two years, and expectations of future rises have also increased (Investment Property Forum (2016) and Investment Property Forum (2018)). Higher rents may make investment in new construction more attractive. However, in spite of solid developments in the rental market, building activity in Oslo has been moderate (Chart 2c). The fairly moderate level of building activity of recent years has likely pushed up rent expectations.

Risk can also increase when yields in different office segments converge. In the years prior to the financial crisis, the yield gap across different European cities compressed (Hagen and Hansen (2018)). Investors' search for yield probably pushed down yields in less attractive cities closer to yields in more attractive cities. In Oslo, prime yields have flattened out in recent years, while non-prime yields have continued to fall (DNB Næringsmegling (2018b)). The yield gap is, however, still considerably wider than in the pre-crisis years. According to DNB Næringsmeglings investor sentiment survey, high prices for office property in Oslo have now prompted a number of investors to consider investing in office properties in Trondheim, Bergen and Stavanger in search of higher yields (DNB Næringsmegling (2018a)).

Periods of rapidly rising prices and high rents incentivise developers to increase building activity. In Norway, the rules for the calculation of VAT give developers a strong incentive to delay building starts until lease agreements have been signed.⁴ This contributes to stabilising the supply of new commercial buildings by ensuring that the occupancy ratios for new buildings are high. But it can also motivate developers to concentrate building activity to coincide with periods when many lease

⁴In Norway, businesses are entitled under certain circumstances to claim a deduction for input VAT if lease agreements are signed within six months after the building was completed. If the building remains unoccupied and lease agreements are signed at a later date, up to 1/10 of input VAT can be deducted annually for up to ten years.

agreements expire, with the risk that older office premises remain empty. Lease expiration for large lease agreements varies somewhat in Oslo (Chart 2d), with somewhat higher volumes in 2019 and 2020 than in 2021 and 2022, but the distribution of agreements appears on the whole to be fairly balanced. Market participants expect the volume of completed office buildings to be relatively low in 2019, then rise somewhat in 2020 (Entra (2018)). Overall, the risk of a substantial oversupply in the short and medium term is assessed to be moderate.

The risk of price falls may be lower for commercial premises that are attractive for conversion into residential property. There is a correlation between commercial and residential property prices even though they are two different products, as conversion over time contributes to some degree of price convergence. The risk of price falls will normally be lower for commercial premises that are attractive for conversion to residential property, primarily in areas where house prices are high. Many office buildings in relatively central locations in Oslo have been converted into housing in recent years, reflecting rapid house price inflation.

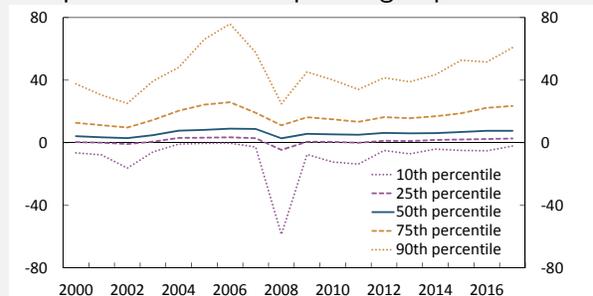
Valuation requirements in financial statements can amplify cyclical fluctuations in reported earnings

Earnings in the CRE sector, measured as ordinary profit before tax, have historically been cyclically sensitive. The share of CRE debt that was in CRE corporate groups with negative earnings was high between 2001 and 2003, and between 2008 and 2009 (Chart 1b). In 2008, companies with negative earnings accounted for more than 70 percent of CRE sector debt, while the share was only between 10 and 15 percent in the preceding years. An important reason for this is the substantial impact on profits of large changes in investment properties' market values. For example, a write-down following a price fall of 10 percent can amount to twice the rental income for the period. According to Norwegian accounting legislation, non-current assets cannot be written up, but non-current assets must be written down to fair value when a fall in value is not expected to be transient. Rising property prices will not normally affect profit unless the value of the property has previously been written down.

Listed companies have been required to use International Financial Reporting Standards (IFRS) in their consolidated financial statements since 2005. Listed CRE companies are few in number, but account for a substantial share of market value in the CRE sector. Under IFRS, listed CRE companies can recognise investment properties at fair value, ie record changes in the value of properties as income or expenses, as appropriate. Higher property market values result in higher recorded earnings. As properties can be written up in good times, price falls in subsequent bad times result in larger write-downs than is the case under Norwegian accounting legislation.

The chart below shows net profit ratios for corporate groups in the CRE sector. During the upturn prior to the financial crisis, a number of the large CRE companies using IFRS were among those with the highest net profit ratio, typically within the 90th percentile. In 2008, these same companies had a net profit ratio in the lower 10th percentile. Weighted, these companies account for a large share of the CRE sector and as a result generate relatively substantial accounting volatility through the period.

Net profit ratio¹ for corporate groups in the CRE sector. Percent. 2000 - 2017



1) Ordinary profit before tax as a share of operating revenue.

Source: Norges Bank

Risk associated with financing

The way commercial real estate is financed is also associated with risk. Although CRE loans share some similarities with residential loans, with relatively long repayment periods and emphasis on the loan-to-value (LTV) ratio, there are two important differences:

- The terms of CRE loans are normally considerably shorter than the amortisation period. Normally, the loan term of a CRE bank loan is around three to five years, while bonds have a somewhat longer maturity (Due (2018) and Investing in Norway (2018)). Principal payments are not usually made in the bond market, while bank loans may include principal payment requirements. When the loan term ends, the remaining balance on the loan must be repaid in one payment.
- Banks' LTV limits are normally more restrictive than for residential mortgages and will vary considerably from mortgage to mortgage. For standard office buildings in central Oslo, LTV limits have hovered around 60 percent in recent years (UNION (2018a)).

The mismatch between the length of the loan term and the amortisation period entails refinancing risk. If the bank is not willing to renew the loan, the CRE company will have to apply to another credit institution to refinance the loan or obtain bond financing. If the company is unsuccessful, the bank will have to assess whether it will extend the loan, or the CRE company will have to sell property to repay the debt. If the selling price does not cover outstanding debt, the bank will have to post a loss. Given an LTV limit of 60 percent and an interest-only mortgage, the bank will incur losses if CRE prices fall by more than 40 percent. It can be difficult to refinance or finance property purchases when banks have incurred or risk incurring losses on commercial real estate.

There are reports that banks are now offering more shorter-term mortgages than previously, but there is insufficient data to draw definitive conclusions about the extent of this change (Estate (2015)). Under liquidity risk regulation, holding liquid assets is an advantage, and shorter loan terms can therefore lower the cost of financing. The capital adequacy framework may also provide IRB banks with an incentive to keep loan terms low. This is because capital ratio requirements under the advanced IRB approach increase with the term of the loan.⁵

3 Losses on loans for commercial real estate management and possible systemic risk

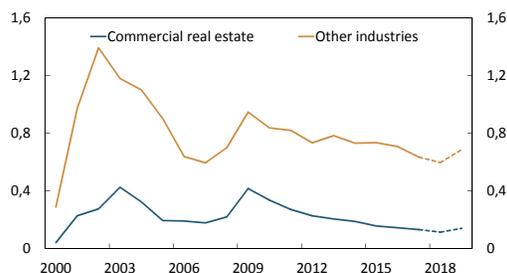
The past 20 years have been characterised by rising property prices, and CRE loan credit risk has been low (Chart 3a). In the past 10 years, losses on CRE loans in Norway have on average accounted for less than 20 percent of total loan losses to non-financial enterprises (Chart 3b), which is substantially lower than the CRE sector's share of total lending. The loss ratio for the CRE sector is lower than in most of the other sectors to which banks' have substantial exposures.

⁵Note that this is not relevant for actual capital ratios today, as the Basel I floor is binding for most Norwegian IRB banks. Nonetheless, banks could start to adjust now in the expectation that the floor will be eliminated.

However, commercial real estate has historically been a main source of problems for banks during financial crises. During the banking crisis in Norway in the early 1990s, losses on CRE loans (and expected impairment losses) were an important factor behind the problems for large Norwegian banks. We know that this also applies to other countries. In the US, non-performing loans in the CRE sector were significantly higher than in non-CRE sectors both during the banking crisis at the beginning of the 1990s and during the financial crisis of 2008-2009 (Chart 3c).

Chart 3

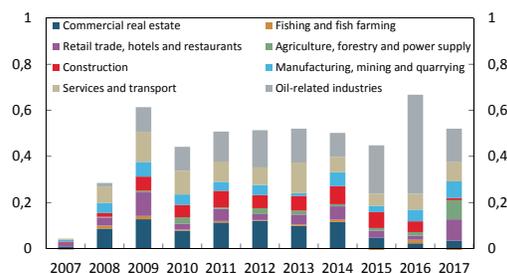
(a) Estimated credit risk¹ by sector. Percent. 2000 - 2019²



- 1) Estimated bankruptcy-exposed bank debt by sector as a share of total bank debt in that sector.
- 2) Model projections for 2018 and 2019.

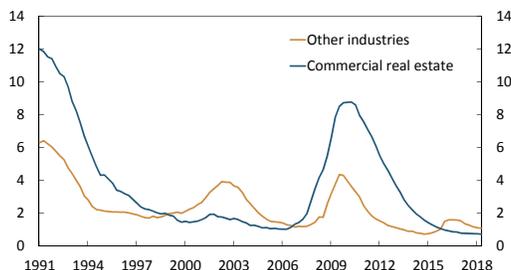
Source: Norges Bank

(b) Banks' corporate loan losses¹ as a share of total corporate lending. Contribution from each sector². Percent. 2007 - 2017



- 1) All banks in Norway excluding foreign branches. Nordea is included in all the years.
 - 2) Industries have been reclassified in order to present oil-related industries as a separate category.
- Source: Norges Bank

(c) Non-performing loans in the US commercial real estate sector as a share of total loans to the sector. Quarterly. Seasonally adjusted. Percent. 1991 Q1 -2018 Q2



Sources: FRED database and Federal Reserve St. Louis

A characteristic of financial crises is pronounced price corrections in the real estate market. As pointed out in the box on page 11, sharp declines in property prices will affect CRE companies in that impairment losses result in negative results. At worst, lower asset values can result in negative equity. During the financial crisis in the US, price corrections in the CRE market and the increase in losses for CRE companies were very closely correlated.

This is amplified because an average price fall will not adequately reflect the risk in such a

situation. When prices fall by 30 percent, as was the case in the US in the period between 2008 and 2010, the fall in prices is likely to vary considerably from property to property. Many properties will be written down by considerably more than 30 percent. Even companies with a relatively low debt ratio prior to the price fall could therefore potentially run into difficulties in a severe downturn.

Even though banks know that losses on commercial real estate loans have been high in bad times, it can be difficult to take this into account when pricing CRE loans in normal times because the probability of a crisis within the term of the loan is low. As a result, for an individual credit institution, the "crisis risk" associated with a given loan agreement will be low. Owing to competition between lenders, the price of a given loan may not sufficiently take account of the cost in the event of a financial crisis. Over time, however, loan contracts must be rolled over, and some banks will be saddled with these loan contracts when a crisis occurs, potentially incurring large losses. The problem is amplified because a sizeable share of the banking sector is exposed to commercial real estate and because problems in this sector are triggered by a fall in property prices, which affects a broad range of economic agents simultaneously.

Such systematic mispricing of CRE loans is an example of market failure. Lenders take into account the risk associated with their own loan contracts, but not the risk over the lifetime of a project and not the contagion risk for other economic agents. Even though the pricing of each individual contract may be appropriate from the microeconomic point of view of the individual bank, risk associated with CRE loans may at the same time be mispriced from a macroeconomic perspective. For example, this may mean that the price of commercial real estate debt is too low relative to equity. As a result, debt ratios are too high and banks' relative exposure too large. Risk is amplified as the risk trigger is property prices, which are typically correlated across segments and regions. Substantial falls in property prices could therefore affect a large share of the banking sector at the same time, with potentially self-reinforcing effects.

4 Summary

Commercial real estate has historically been a main source of problems for banks during financial crises. Exposure to the CRE sector is high across the Norwegian banking sector. As the CRE sector is vulnerable to pronounced changes in property prices, the banking sector is exposed to a common risk factor. Even though commercial real estate is a heterogeneous sector, there are strong common drivers. Thus, in a severe downturn, many Norwegian banks could face a negative shock at the same time. The challenge of CRE loans is amplified because there is often a mismatch between a project's lifetime and the term of the loan contract. This can contribute to market failure and loan mispricing over the business cycle, with underpricing in good times (and possible overpricing in bad times), which can amplify the systemic risk element.

Prices for commercial real estate in central Oslo have risen markedly in recent years. High commercial real estate price inflation has historically been followed by problems in the CRE sector. A low supply of land in Oslo may, however, have a stabilising effect on the current situation. We find that the leasing of office space in particular should be regarded as a financial risk. Other large leasing classes, such as retail and hotels, are more industrial in character, with a longer-term perspective

on management and ownership, which will likely dampen systemic risk associated with divestment in periods of sharp falls in property prices. On the other hand, hotels and shopping centres are characterised by a small number of large owners, and concentration risk is therefore high. There is also a risk that rising online retailing will create challenges for retail property in the long term.

The combination of vulnerability to common shocks and possible market failure emphasises the need for effective regulation. Regulation must ensure that risk is taken into account over a project's entire lifetime, for example by giving weight to the lessons learned from the financial crisis when calculating risk weights and capital requirements. In addition, efforts should be made to avoid regulation which has the effect of rewarding short-term loan contracts in the CRE sector.

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