

# DANMARKS NATIONALBANK

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## The riskiness of corporate credit allocation is increasing



### **New indicator of the riskiness of credit allocation**

This analysis introduces a new indicator of the riskiness of corporate credit allocation based on firms' financial statements.

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### **Riskiness tends to increase in an upswing**

The indicator shows an increase in the riskiness of credit allocation in the most recent upswings. Overall, riskiness was lower in 2017 than in the pre-crisis period, however.

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### **Similar development across industries**

Unlike in the pre-crisis period, no particular industries stand out. Before the financial crisis, the real estate and rental industry in particular contributed to risky credit allocation.

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## Riskiness may build up if credit is allocated to the riskiest firms

In the current economic upswing, growth in lending to non-financial corporations has been moderate, cf. Chart 1. Lending by mortgage credit institutions has been the main driver of growth in recent years, while lending by banks was the main driver in the pre-crisis years.

Even moderate lending growth entails new lending. As the existing volume of loans is redeemed, new lending activity is needed simply to maintain a constant lending volume. If credit standards are eased and new loans are allocated to the riskiest firms to an excessive extent, riskiness may build up.

The analysis examines whether the quintile of firms with the highest debt increases is riskier than the quintile with the lowest debt increases. This enables identification of any build-up of riskiness in credit allocation that is not captured by lending growth. The calculated indicator shows the development in the riskiness of credit allocation.

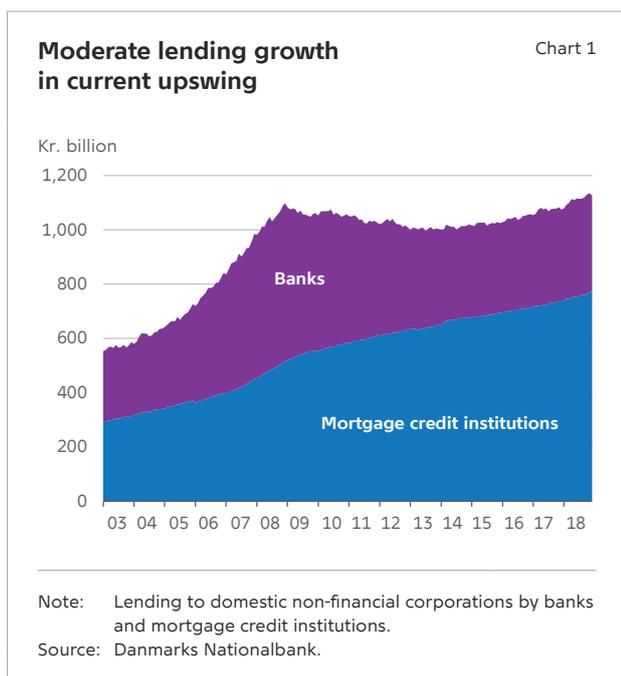
The analysis uses corporate leverage<sup>1</sup> as a measure of riskiness. Highly leveraged firms have a low share of equity funding. Equity is the funding type most capable of absorbing losses. With a small share of equity funding, a firm's finances will be less robust and its debt riskier.

## The riskiness of credit allocation has been increasing since 2013

On the basis of financial data for Danish firms, the indicator shows that the riskiness of credit allocation has been increasing since 2013, cf. Chart 2.

A higher indicator value means that, on average, the firms with the highest debt increases have become more leveraged than those with the lowest debt increases.<sup>2</sup> Box 1 describes how the indicator is calculated. The relative difference in leverage between firms with the highest and lowest debt increases reached a trough in 2012 and has risen continually since then. This development accelerated in 2016 and a further rise was seen in 2017.

The indicator points to a strong increase in the riskiness of credit allocation in the pre-crisis years. Before the financial crisis, credit standards were eased, and the period was also characterised by an optimistic outlook for asset prices. This contributed to an overheating of the economy. A questionnaire survey disclosed that virtually all loan applications were accepted, irrespective of the firm's financial ratios.<sup>3</sup> The very low percentage of rejected loan applications and the considerable credit demand contributed to a strong increase in corporate debt.



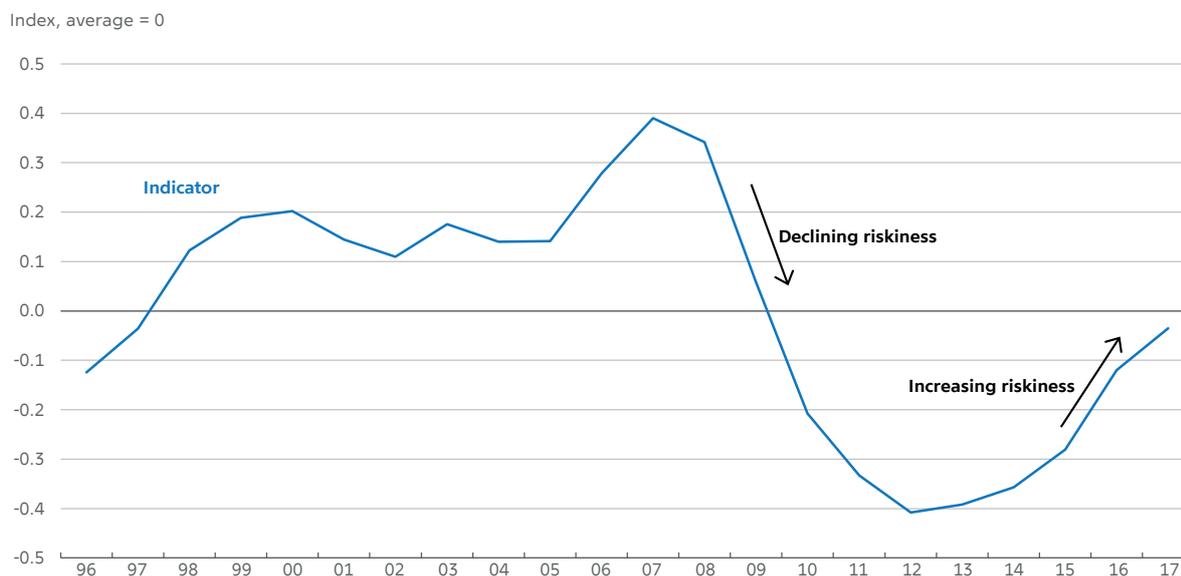
1 Leverage is defined as the debt-to-assets ratio.

2 What is considered is thus the difference in leverage between the two groups of firms, not the average leverage for all firms in a given year. Hence, the indicator is not affected by any average or structural changes in firms' leverage.

3 S.G. Andersen and A. Kuchler, Credit standards and capital allocation in a low interest-rate environment, *Danmarks Nationalbank Working Paper*, No. 107, June 2016.

The riskiness of credit allocation has been increasing since 2013

Chart 2



Note: 2-year moving average of the indicator of the riskiness of credit allocation. A positive (negative) value indicates that the riskiness of credit allocation is higher (lower) than its historical average. Firms in the "Financial and insurance, etc." industry have been excluded. See the calculation in Box 1.

Source: Bisnode and own calculations.

During the financial crisis, credit institutions tightened credit standards for corporate loans. This is also reflected in the indicator. The riskiness declined from the high pre-crisis level. The indicator suggests a lower riskiness of credit allocation than in the pre-crisis years.

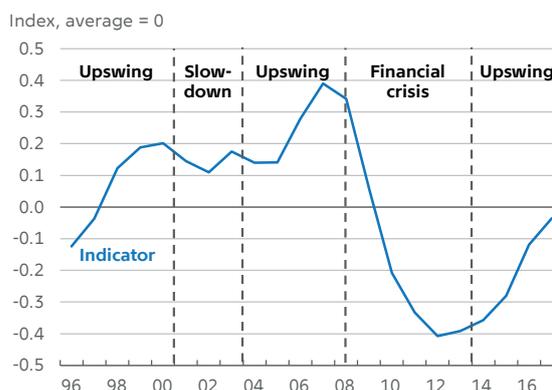
### Riskiness tends to increase in an upswing

The riskiness of credit allocation has generally mirrored the cyclical development, cf. Chart 3. The indicator rose during the upswing in the 1990s, peaking before the slowdown in the early 2000s. The indicator was then relatively stable before riskiness really took off in the pre-crisis years.

Risky and less robust firms often have easier access to credit in an upswing, when firms' investment and earnings opportunities tend to improve and their demand for loans grows. At the same time, asset prices tend to rise in an upswing, thereby

Riskiness tends to be cyclical

Chart 3



Note.: 2-year moving average of the indicator of the riskiness of credit allocation.

Source: Bisnode and Danmarks Nationalbank.

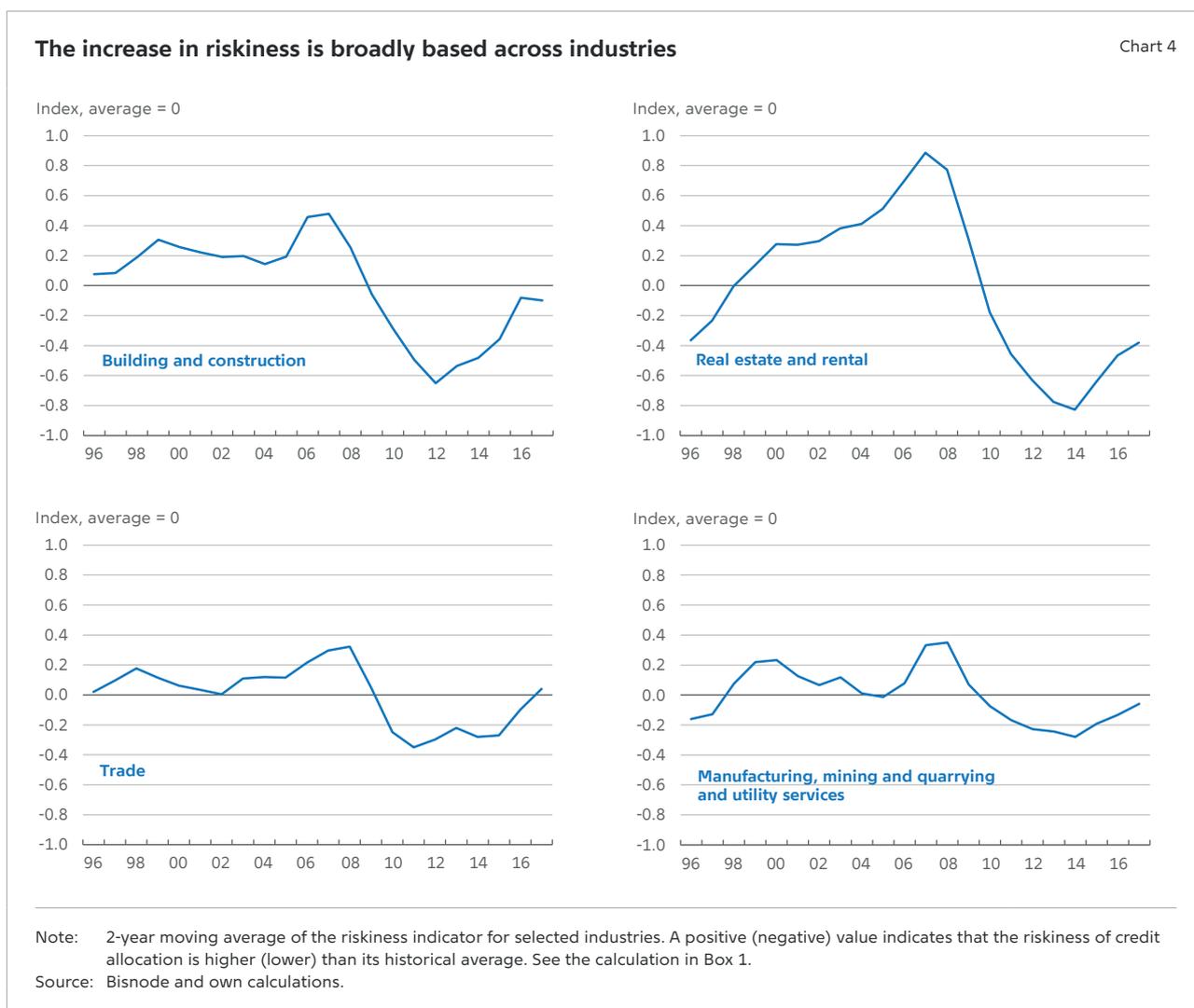
increasing firms' collateral capacity. That is a natural element of economic growth. Increased credit allocation to more highly leveraged firms may reflect prudent credit assessment and allocation of resources to the most productive firms. On the other hand, if lenders are too optimistic and willing to take risks, this may lead to too loose credit assessments and excessive risk-taking, which could pose risks to future financial and economic stability. The indicator can thus be used to illuminate the level of riskiness.

The IMF has used a similar indicator to analyse the riskiness of credit allocation across many countries.<sup>4</sup> Their conclusion is also that riskiness is generally cyclical and that it peaked just before the financial

crisis. The IMF results show that an increase in the indicator heightens the risk of financial instability.

## Similar development across industries

Recent years' increase in the riskiness of credit allocation is broadly based across all industries, cf. Chart 4. The riskiness of credit allocation to cyclical industries, which account for the largest share of corporate lending, cf. Chart 5, has increased in recent years for all of the industries. However, the indicator points to unchanged riskiness for the construction industry in 2017.



4 International Monetary Fund, *Global Financial Stability Report: A bumpy road ahead*, April 2018.

In the current upswing, the cyclical industries' contributions to the riskiness of credit allocation seem to be relatively equal. In the pre-crisis period, credit allocation to especially real estate and rental contributed to risky credit allocation. From the mid-2000s there were elements of an actual bubble in parts of the commercial real estate market, where prices were to some extent driven by expectations of further price increases and resultant capital gains. Several of the banks which were unable to continue as independent institutions in the wake of the crisis had particularly strong lending growth and considerable exposure to the real estate sector. The indicator captures the riskiness related to this industry, showing that it reached a clear peak just before the crisis.

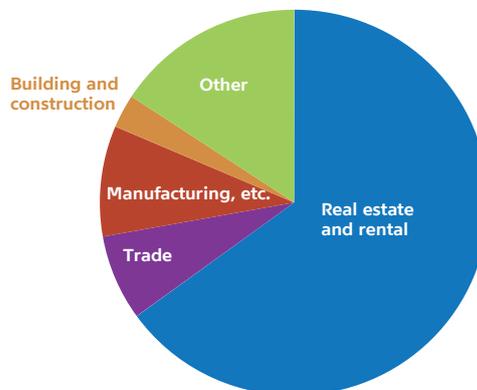
### Danmarks Nationalbank's lending survey also indicates easier credit standards

The development in the indicator is consistent with Danmarks Nationalbank's lending survey. With a few exceptions, the banks and mortgage credit institutions have reported easing of credit standards since 2013, cf. Chart 6, citing competitor pressure as motivation, cf. Chart 7. This may have contributed to the increased raising of debt among the riskiest firms that has been captured by the indicator.

Danmarks Nationalbank's lending survey is a qualitative survey of credit standards. Credit managers of banks and mortgage credit institutions report whether credit standards have been eased or tightened relative to the preceding quarter. The lending survey relates to the change in credit standards, but not to the level. Hence, the qualitative measurement of credit standards in the lending survey can be combined with the quantitative measurement in this analysis to assess the level of and development in corporate credit standards and the riskiness of credit allocation.

The cyclical sectors account for the largest shares of corporate lending

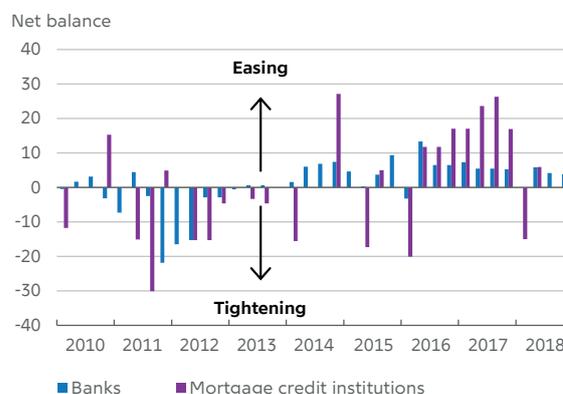
Chart 5



Note: Lending by banks and mortgage credit institutions to non-financial corporations, broken down by industry, percentage average for 2018.  
 Source: Danmarks Nationalbank.

Danmarks Nationalbank's lending survey also indicates easing of credit standards since 2013

Chart 6



Note: Lending survey for corporate customers. The net balance may lie within the interval -100 to 100. A positive (negative) net balance means that credit managers of the banks in question have, overall, i.e. lending-weighted, stated that they have eased (tightened) their standards relative to the preceding quarter. The most recent observation is from the 4th quarter of 2018.  
 Source: Danmarks Nationalbank.

### Calculation of indicator of the riskiness of credit allocation

Box 1

In the analysis, an indicator of the riskiness of credit allocation is calculated using the methodology in the IMF’s Global Financial Stability Report, April 2018.<sup>1</sup> The indicator is based on a measure of firms’ financial resilience. This analysis applies the measure of firms’ leverage. Leverage is calculated as the firm’s debt-to-assets ratio. The IMF also applies other measures of financial resilience than leverage.

The indicator is calculated by allocating a value from 1 to 10 to each firm according to its leverage for each year. The most highly leveraged firms are allocated a 10 (top decile) and the least leveraged firms are allocated a 1 (bottom decile). A higher decile means higher leverage. Firms are then divided into five groups of equal size, ranked according to debt accumulation. Debt accumulation is calculated as the change in debt relative to last year’s assets,  $\frac{Debt_t - Debt_{t-1}}{Assets_{t-1}}$ .

The average leverage decile is then calculated for the group of firms with the highest debt increases and for the group of firms with the lowest debt increases/highest debt reduction. The indicator is calculated as the difference in average leverage decile between firms with the highest and lowest debt increases, cf. the chart below. The historical average is then subtracted. A positive (negative) value indicates that the riskiness of credit allocation is higher (lower) than its historical average.

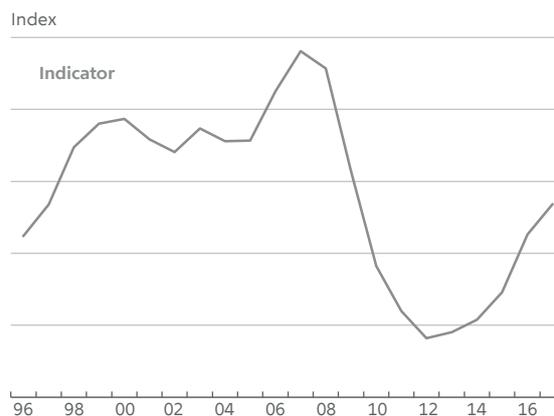
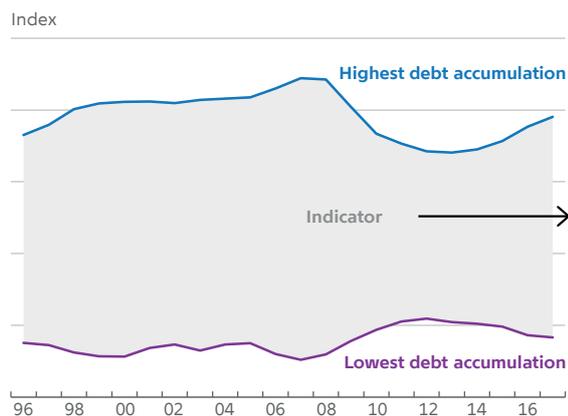
The indicator measures the development in risk (in terms of leverage) for firms with the highest debt increases rela-

tive to firms with the lowest debt increases. For example, assume that all firms increase their leverage by 5 percentage points and that debt accumulation rises proportionally. The average leverage will increase by 5 percentage points for all firms, but the value of the indicator remains unchanged. Conversely, in the event of a 5 percentage point increase in leverage for the firms with the highest debt increases and a 5 percentage point fall in leverage for the firms with the lowest debt increases, the average leverage for all firms will remain unchanged, but the indicator will rise.

Hence, the indicator is not affected by any average or structural changes in firms’ leverage. The average leverage will typically fall in an upswing as earnings opportunities improve. This does not affect the indicator, as it is based only on the ranking of firms’ leverage in a given year. The decile approach thus makes it meaningful to compare the value of the indicator over time and across other measures of firms’ resilience than leverage. The IMF also demonstrates that the average leverage for all firms captures build-up of riskiness in credit allocation only to a minor extent.

The indicator is based on financial data from Bisnode and covers Danish public and private limited liability companies.<sup>2</sup> Firms in the “Financial and insurance, etc.” industry have been excluded. Firms’ total debt is used in the indicator, meaning that it includes other funding sources besides credit from banks and mortgage credit institutions.

### Illustration of calculation



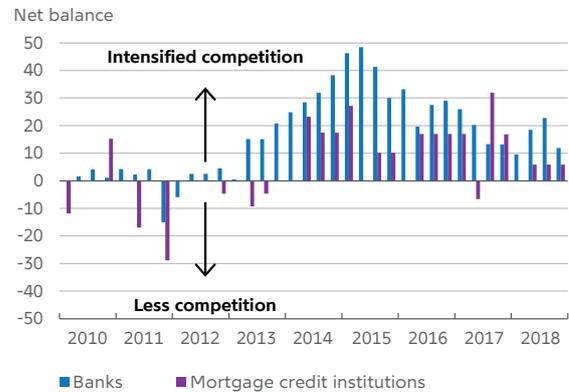
Note: *Left:* 2-year moving average of leverage index for firms with the highest and lowest debt increases, respectively.  
*Right:* Difference between the two indices in the left-hand chart.

Source: Bisnode and own calculations.

1. International Monetary Fund, *Global Financial Stability Report: A bumpy road ahead*, Chapter 2, The riskiness of credit allocation: A source of financial vulnerability?, April 2018.  
 2. The vast majority of firms in the “Agriculture, forestry, fishing” industry are neither public nor private limited liability companies, meaning that the data covers only a small share of the agricultural industry.

### Institutions cite competition as the motivation for easing

Chart 7



Note: Lending survey for corporate customers. The net balance lies within the interval -100 to 100. A positive (negative) net balance means that credit managers of the institutions in question have, overall, i.e. lending-weighted, stated that competitor behaviour has contributed to easing (tightening) of credit standards. The most recent observation is from the 4th quarter of 2018.

Source: Danmarks Nationalbank.

## ABOUT ANALYSIS



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

The analysis consists of a Danish and an English version. In case of doubt regarding the correctness of the translation the Danish version is considered to be binding.

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