Sustainable lending in Realkredit Danmark

Society

May 2020

REALKREDIT Danmark

Contents

Why this report

As a mortgage bank, we play an important role in society. We provide mortgage finance needed for families to purchase a home, for residents to establish cooperative housing, for housing companies to invest in rental housing, and for companies and organisations to invest in property from where they can do their business. In doing so, we help society to grow and prosper.

It is our ambition to interact with society responsibly. We subscribe to the Danske Bank Group ambition to conduct our business in a responsible and transparent manner and support financial stability by being solid, balanced, and predictable.

We serve customers in all parts of society across all of Denmark. We offer mortgage finance to home-owners, cooperative housing, rental housing, public housing, farmers, and companies and organisa-tions, private sector as well as public sector. We reach out to customers in all of Denmark through the Danske Bank branch network as well as digital channels.

Homeowner	Cooperative housing	Rental housing	Public housing	Farmers	Companies and organisations
393,700	2,399	5,819	1,245	6,812	7,183

Number of customers end 2019
Source: Realkredit Danmark

We are rooted in the Danish mortgage banking tradition, which builds on transparency, fairness, scala-bility and stability. We set mortgage rates on the back of funding rates we obtain from covered bond markets and we set margins on the back of risk parameters on equal terms for all customers. This we believe is both fair and transparent.

Further, we scale our mortgage lending activities while maintaining focus on risk and long-termism. We strive to maintain a risk profile, which allows us to provide mortgage finance through the ups and downs of economic cycles. From end 2007 to end 2010 when the financial crisis endured, we grew lending by DKK 77bn.

For an outline of our impact on climate and environment we refer to the report sustainable lending in Realkredit Danmark, climate..

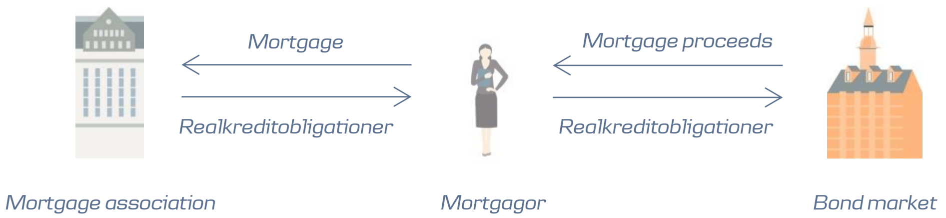
Mortgage finance made fair and transparent

Realkredit Danmark is rooted in Danish mortgage banking tradition. The tradition was established in 1797 when Danes were in need of financing for the rebuilding of Copenhagen following a great fire two years earlier. With a view to Prussian *Pfandbriefe*, Danes introduced *Realkreditobligationer* to be issued from a newly established mortgage association.

From the enactment of the first Mortgage Banking Act in 1850, mortgage associations were cooperative institutions. No shareholders were available to infuse capital or collect returns. Instead, mortgage associations were capitalised from withholding a percentage of mortgage proceeds as liable capital to be returned to the mortgagor upon maturity and profits, though limited, were retained to strengthen the capital base.

Specialist banks rooted in associations

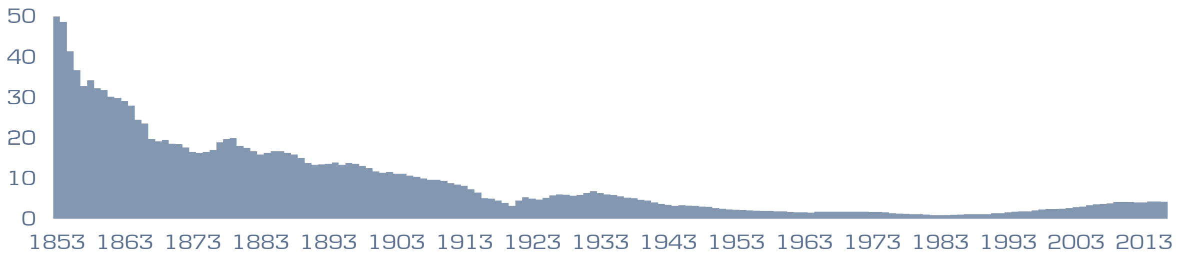
Mortgage associations operated a specialised business model based on mutuality. Each mortgage would form part of a mortgage pool for which all mortgagors were joint and several liable. From the mortgage pool the mortgage association would issue *Realkreditobligationer* to match the notional of the mortgage. The mortgagor would then sell the *Realkreditobligationer* issued in the bond market to obtain the mortgage proceeds. In addition to pay interest and notional on the *Realkreditobligationer* issued, the mortgagor would pay a margin to the mortgage association derived from price list reflecting the loan-to-value of the mortgage.



Source: Realkredit Danmark

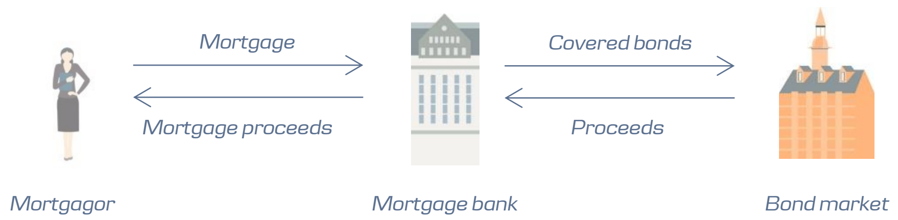
Operating this business model, mortgage associations mutualised risk and terms. The risk of mortgagor default was mutualised amongst the whole pool of mortgagors and, further, the terms of the mortgage were mutualised as all mortgagors, rich and poor, would be offered same terms, same mortgage rates, and same margins.

The mortgage association business model worked its part. Volumes grew rapidly and mortgage finance became available to everyone with a property to mortgage. Today, mortgage finance remains the preferred way of lending accounting for 69 percent of financial institutions' lending to the real economy.



Note: Average mortgage to per capita GDP (factor)
Source: Statistics Denmark and Central Bank Statistics

Mutualisation principles persists today, though mortgage associations have transferred into financial institutions and limited companies. Mortgages rates are set mark-to-market on same terms for all mortgagors and retail segment margins are derived from public price list to reflect loan-to-value and mortgage characteristics. Terms remain the same for rich and poor.



Source: Realkredit Danmark

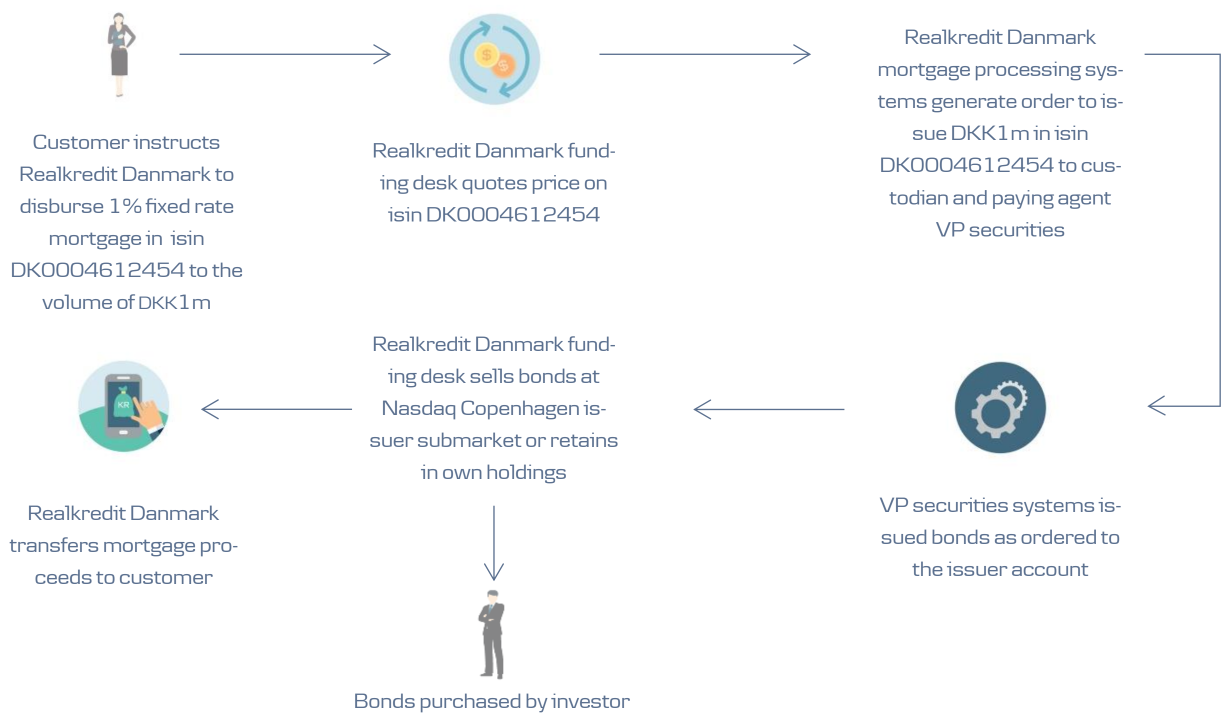
Further, mortgage banks remain specialist financial institutions. Applicable law confines activities of mortgage banks to mortgage lending funded by covered bond issuance. This safeguards mortgage banks from risk contagion from other banking activities.

Mark-to-market mortgage terms

Today, the mortgage bank typically sells the covered bonds issued for the funding of the mortgage in the bond market and transfer the proceeds to the mortgagor. Yet, the link between the mortgage and the covered bonds issued remains a distinct feature of mortgage banking in Denmark.

Covered bond are issued in series and each mortgage is funded by a specific series. Which series is fully transparent to the mortgagor. The terms of the mortgage mirror the terms of the covered bond series funding the mortgage e.g. a thirty year fixed rate amortising mortgage if funded by the issuance of fixed rate amortising covered bonds maturing thirty years from now in 2050 and so forth. This we refer to as a pass-through funding structure.

The mirroring terms extends to the fixing of the mortgage rate. The mortgage rate is set to equal the funding rate of the covered bond series plus a fixed margin mark-up funding the mortgage at the exact time of the transaction. This we refer to as mark-to-market pricing.



Source: Realkredit Danmark

The mirroring terms further extends to prepayment costs. Mortgages are prepayable at any time at the market value of the outstanding covered bonds issued for the funding of the mortgage. If callable, which applies to all fixed rate mortgages, prepayment costs are capped at notional value. This allows the mortgagor to prepay at fair value free of prepayment penalties.

Pass-throughs and mark-to-market mortgage terms not only ensure fairness and transparency. They further extends the principle of mutualisation and equal terms for all. In essence, pass-throughs and mark-to-market pricing allow retail mortgagors to finance their property at capital market rates at par with large-scale corporates.

Retail margins are standard and transparent

Margins are collected on top of mortgage rates, separately and transparently. Month for month and cent for cent, the mortgagor is informed of the amount paid to the investor and the amount paid to the mortgage bank.

In retail, margins are standard and available to the public. For each loan-to-value bracket and for each type of mortgage, a standard margin applies. This allows the mortgagor to compare margins across mortgage banks easily.

	Loan to value range		
	- 40%	40% - 60%	60% -
Fixed rate to maturity	0.2785	0.8248	1.3500
Floating rate	0.4500	1.0000	1.5252
Interest reset every year	0.7000	1.2500	1.7752
Interest reset every three years	0.6500	1.2000	1.7252
Interest reset every five years	0.4500	1.0000	1.5252

50% LTV:

$$\frac{40\%}{50\%} * 0.2785 + \frac{10\%}{50\%} * 0.8285 = 0.3848$$

Note: Extract from price list available at https://www.rd.dk/PDF/Privat/Prisblad-privat.pdf
Source: Realkredit Danmark

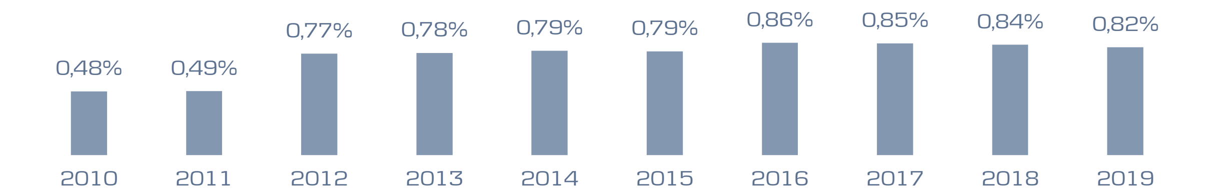
The standard margins are non-negotiable and, consequently, are offered to all mortgagors, be they rich or poor. Risk is considered by standard margins depending on the loan-to-value ratio.

Margins apply to the entire duration of the mortgage. Mortgage banks reserve the right to adjust the margin. In doing so, the mortgage bank is required to give six months' notice, waive all prepayment costs, and explain in detail the reasons for the adjustments. Further, the mortgage bank is required to inform the Financial Supervisory Authority and seek pre-approval of the margin adjustment.

Coming out of the Financial crisis, mortgage banks raised margins on interest only mortgages and floating rate mortgages, in particular, whereas margins on fixed rate amortising mortgage remained close to pre-crisis levels. Margins were adjusted for reasons specific to mortgage banks, however, a common denominator was the need to price risk. In general, interest only and interest reset and floating rate loans are perceived riskier than fixed rate and amortising and are now priced accordingly.

Note: Margins against inherent risk profile
Source: Realkredit Danmark

Realkredit Danmark raised margins along with the market. From an average retail margin at 0.48 percent per annum Realkredit Danmark raised margins to an average at 0.86 percent in annum in 2016. Since then average margins have contracted from stronger demand for low risk low price mortgages bringing the average retail margin to the level of 0.82 percent per annum and we expect this trend to continue for the near future.



Note: Average retail margin

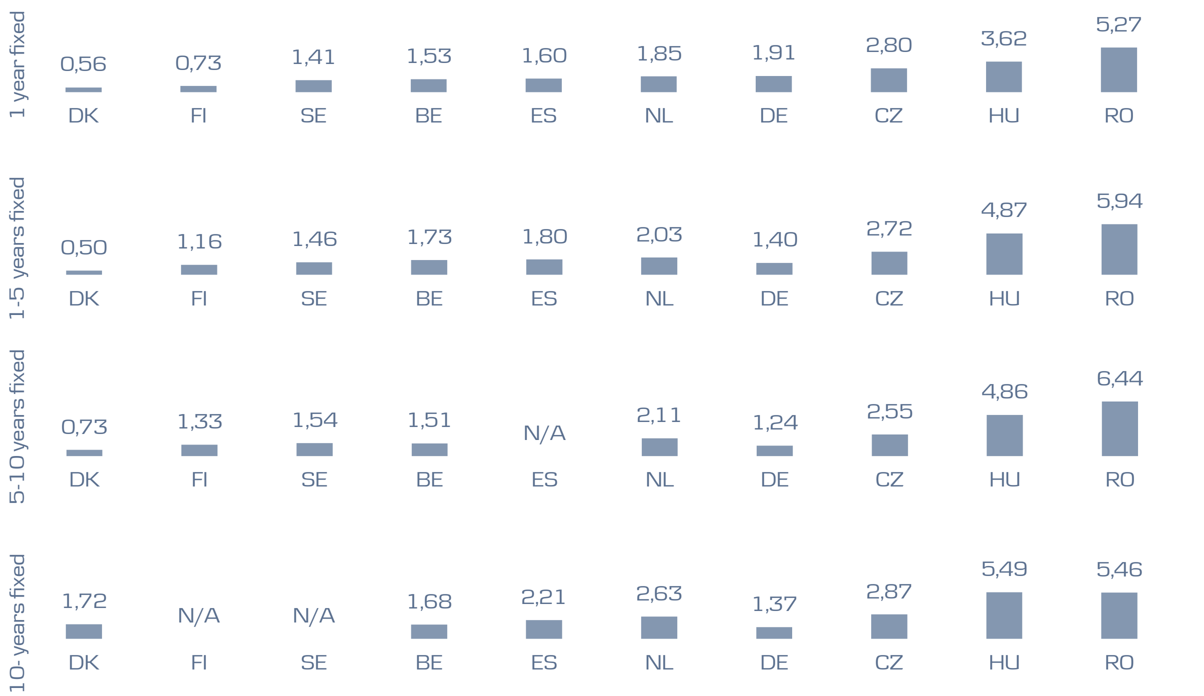
Source: Realkredit Danmark

Danish mortgages still the cheapest in the EU

Despite raised margins, mortgages in Denmark remain the cheapest in the EU.

European Mortgage Federation conducts quarterly reviews on mortgage rates inclusive of margins offered for the purchase of a new home across the EU. The review sorts mortgage rates in four brackets by the length of period for which the mortgage rate is fixed; one year, one to year years, five to ten years, and ten years onwards.

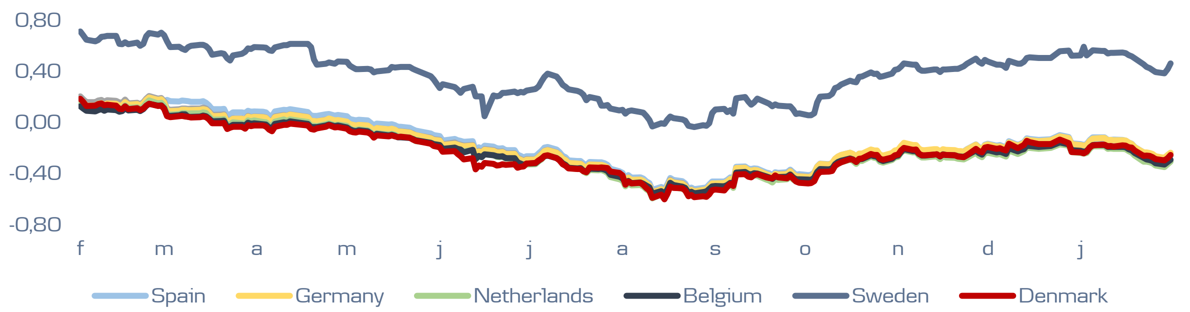
Denmark stands out as the EU member states in which mortgage rates inclusive of margins are the lowest for interest rates fixed for up to ten years.



Note: Mortgage rates inclusive of margins in percent, end third quarter 2019

Source: European Mortgage Federation Quarterly Reviews

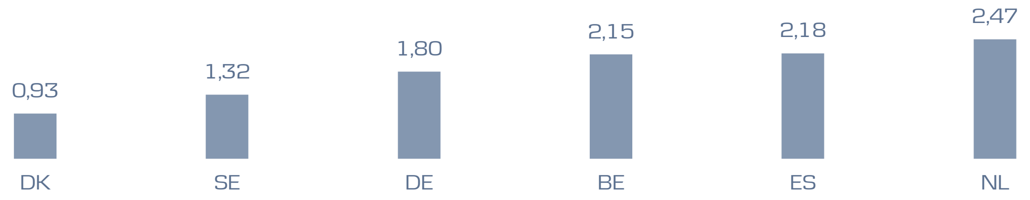
Low funding rates explain their part. Mortgage banks have been successful in attracting a stable investor base keeping funding rates in check. The main reason for investors to invest in Danish covered bonds is the markets long track record of low losses, thus safeguarding investors. To this end, prudent underwriting and efficient collateral enforcement have proven key, see next section of this report.



Note: Covered bond funding rates at terms to maturity of five years, February 2019 to February 2020
Source: Danske Markets

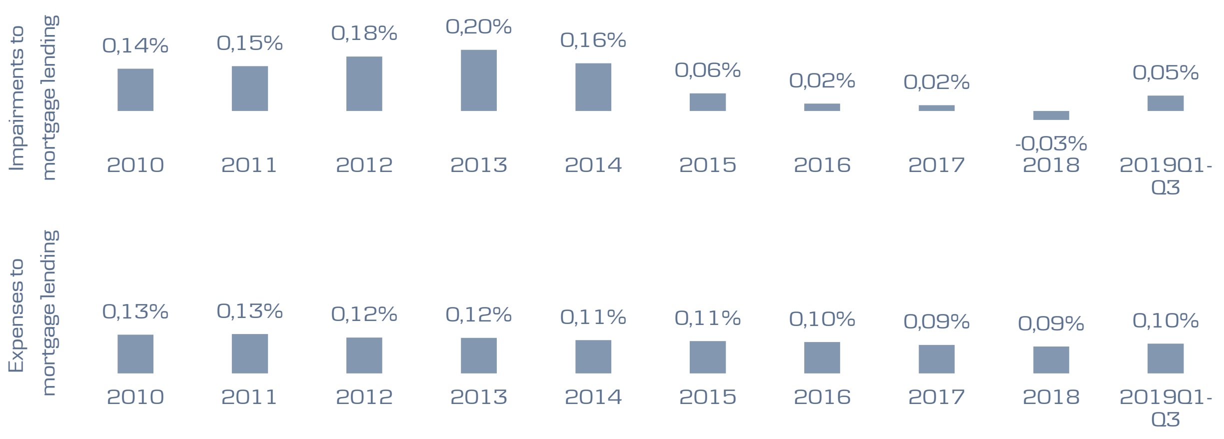
At the time of writing, funding rates are sub-zero for maturities of up to five years. Following the Danish tradition, the sub-zero funding rates are passed on to the mortgagor in full. If the margin is low from a low loan-to-value ratio, cash flows are reversed and mortgagors are actually paid to hold a mortgage.

Low margins provide a significant contribution as well. We do not know of other markets where administrative margins are separated from the mortgage interest rate to providing a unique level of transparency. Consequently, numbers available do not allow for a direct comparison. When subtracting funding rates from mortgage rates we arrive at an implied margin.



Note: % year fixed rate, the implied margin rest on the assumption that all mortgages are covered bond funded
Source: Danske Markets and Realkredit Danmark

Margins are low from the combination of low risk and low cost of operations. For Realkredit Danmark, impairments to mortgage lending remained below 0.20 percent throughout the financial crisis and have now stabilised at less than 0.05 percent per annum whereas expenses to mortgage lending has declined to 0.10 percent.



Source: Realkredit Danmark

Expenses are kept in check by the scalability of mortgage banking. Mortgages and services are standard across segments and markets, and customisation kept at a minimum.

Reverting to international comparisons, Denmark is surpassed by Germany and Belgium in terms of delivering cheap housing finance for fixing periods of ten years or more.

The standard mortgage product in Denmark is the 30-year fixed rate to maturity, callable at par value mortgage, by the mortgagor end each quarter. In an EU comparison, this mortgage product is unique. On the one hand, the fixed rate to maturity safeguards the mortgagor from any increase in market rates for the next thirty years. On the other hand, the call-ability of the mortgage allows the mortgagor to refinance into lower a mortgage rate, should market rates decline.

Callable mortgages are financed by pass-through callable covered bonds. Consequently, the call risk is absorbed by the investor. For this, the investor demands a premium typically at 0.50 percent. This explains, why the combined mortgage rate is higher for Denmark than peers for this particular bracket.

Mortgagors make use of the opportunity to refinance into lower mortgage rates at great scale. During 2019, 400 000 mortgages worth DKK 155bn, were refinanced with Realkredit Danmark into lower mortgage rates with implied savings of DKK 1bn per annum.

Underwriting responsibly

Underwriting responsibly is essential in being fair. Underwriting irresponsibly, whether in declining applicants who can afford the mortgage or in approving applicants who cannot, come at a cost to the applicant, to the bank, and to society at large. Just think of the US subprime crisis as the prime example of what harm can come from underwriting failure.

At Realkredit Danmark, underwriting responsibly is the core of what we do. To this end, we operate detailed underwriting procedures to ensure informed and fair decisions can be made.

Retail underwriting is based on stressed affordability. We test affordability against income reported to tax authorities, fixed expenses including housing costs, transportation costs, costs of day care, unemployment insurance and so forth and variable expenses depending on the size of the household.

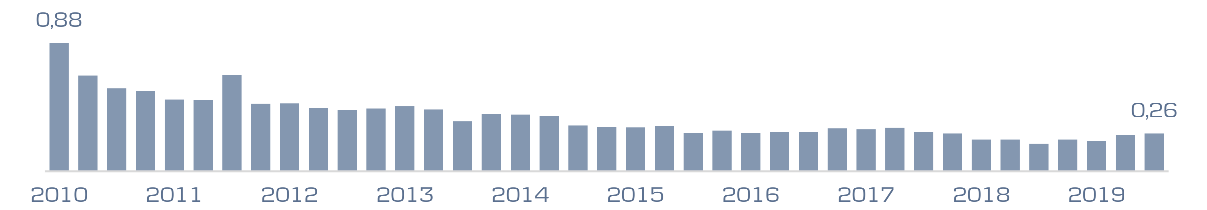
We establish affordability based on current payments on a thirty-year, amortising, fixed rate to maturity mortgage. If the mortgage rate is floating or reset, we stress mortgage payments to the level of a thirty year amortising mortgage at a minimum rate of four percent, which compares to a current fixed rate of just one percent. If the mortgage is interest only, we stress payments to the level of an amortising mortgage. Consequently, the riskier the mortgage, the more we stress.

We restrict the choice of mortgage if debt-to-income and loan-to-value are both high. If so, the mortgage we underwrite is either a thirty-year and amortising interest reset every five years or a fixed rate mortgage, amortising or interest only.

Underwriting, other than retail customers, is based on cash flow available to service the mortgage, assuming stressed mortgage rates, stressed rental income, and stressed occupancy.

Underwriting results in a credit commitment for the entire duration of the mortgage. Realkredit Danmark cannot call the mortgage unless the mortgagor fails servicing the mortgage or fails maintaining of the property pledged, causing the property to depreciate significantly in value. Underwriting is binding, also if the mortgagor suffers a loss of income.

In spite of these precautions, mortgagors do fail at servicing their mortgage in due time. One way to measure the quality of underwriting is by the volume of mortgage payments past due.



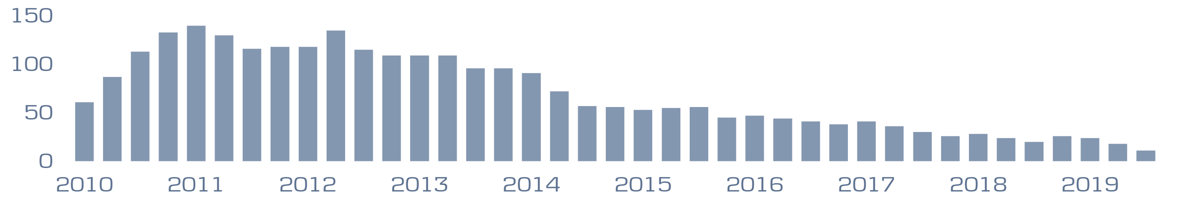
Note: 90 days past due in percent of payments due for retail
Source: Realkredit Danmark

Coming out of the financial crisis, payments past due has declined to the level of 0.25 percent for retail. We think this level confirms underwriting is responsible.

When mortgagors fail to service the mortgage in due time, we send reminders after two weeks and again after four weeks if the mortgagor fails to respond. From then on, we will initiate work-out procedures which may involve a payment moratorium and a voluntary sale of the property.

More than 80 percent of mortgages ninety days past due are cured without foreclosure.

If work-out fails, the next step is foreclosure and repossession of the property. Repossessions are rare and by end third quarter 2019, we had eleven retail properties in repossession only. During the financial crises, the number of properties in repossession peaked at 140. This compares to a total stock of retail properties mortgaged of nearly 384,000.



Note: Stock of retail segment properties in repossession end each quarter
Source: Realkredit Danmark

When we foreclose and repossess a property, the mortgagor loses all rights to occupy. In this scenario, local authorities hold the obligations to provide new housing. No mortgagor will be left in the street with no place to live.

Work-out and foreclosure procedures are not enduring. We may complete the entire process from sending reminders, seeking work-out solutions to foreclosure and repossession within six months.

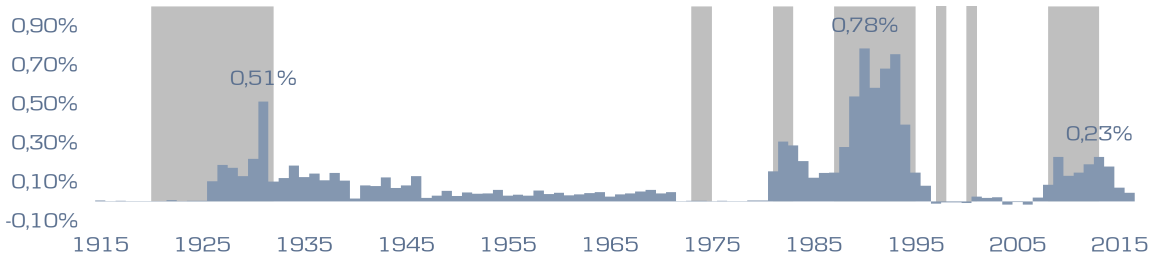
Efficiency in work-out and foreclosure procedures keeps impairments low. Knowing implications of failing to service the mortgage are immediate, mortgagors have a strong incentive to meet their payment obligations and, if unable to do so, seek a work-out solution often involving a voluntary sale of the property pledged as collateral.

Low impairments keep funding costs in check. Investors demand a risk premium reflecting the inherent risk of their investments. When investing in covered bonds issued from Danish mortgage banks investors demand only minor risk premia, reflecting the inherent low risk nature of the system.

Low funding costs keep mortgage rates in check. Low funding costs are pass-through to mortgagors who stand to get the full benefit. Further, investor confidence implies funding markets remain open during periods of market stress and crises. The Danish mortgage market has grown its outstanding amount of bonds and thereby debt every year since 1815.

Source: Realkredit Danmark

Low impairments are not new to Danish mortgage banking. Since 1915, impairments have averaged 0.11 percent of the mortgage book per annum with peaks during financial crises and troughs immediately thereafter. Under normal operating conditions, impairments have been only 0.04 to 0.05 percent.



Note: Impairments to mortgages, in percent. Grey areas mark financial crises
Source: Source: Statistics Denmark and Central Bank Statistics

The worst crisis on record to hit Danish mortgage banking dates back to the late 1980s and early 1990s. Impairment levels reached 0.78 percent in 1990 from a combination of a structural financial reform leading to a sharp increase in the cost of borrowing, consequently contraction in economic activity and lax underwriting in the years up to the crisis.

From Until the mid-1980s Denmark had a current account deficit and deficit in the government budget, forcing the currency to depreciate against its European peers. The outcome was inflation rates exceeding 10 percent per annum and interest rates reaching as high as 22 percent in 1986. The impact of high interest rates were partly offset by full tax deductibility. With marginal tax rates as high as76 percent, real interest rates after tax were sub-zero spurring credit demand. Mortgage associations, controlled by mortgagors, catered for this demand with no hesitation.

In 1986, the economic policy regime changed to balance public sector spending and external balances. Restrictions on credits were introduced increasing mandatory amortisation. Tax deductibility was lowered to end at 36 percent. Interest rates remained high from the currency now pegged to the German Mark. As a result, house prices fell by more than 20 percent and unemployment grew to more than 10 percent.

For mortgage banks, the new operating conditions resulted in the highest impairments on record. Under the period with high inflation risks were credit risk was reduced thanks to high inflation rates and sub-zero real interest rates. In the new regime, irresponsible underwriting was immediately visible.

The enactment of the Banking Act of 1990 introduced structural reform in the Danish Banking industry. Most importantly, it ended the regulation preventing banks from owning and operating mortgage banks, which triggered in-market consolidation across the sector.

The reform of the Danish banking market was to a large degree a result of the introduction of the Bank For International Settlement (BIS) rules on capital adequacy. These rules were the central banking response to the breakdown of the Bretton Woods agreement in 1971 and were first presented in 1988.

In the aftermath of the crisis, mortgage associations converted into limited companies and sought partnerships with universal banks. Underwriting standards were improved and supervision strengthened, as before 1990 mortgage banking was not under the supervision of Finanstilsynet, the Danish supervisory authority.

The introduction of financial market regulation affected mortgage banks on several levels: underwriting, risk modelling, capital adequacy as well as reporting and disclosure. Mortgage banks also learnt from the management of non-performing loans during the crisis. This prepared the industry for the financial crisis in 2008, during which impairments never reached above 0.23 percent per annum.

Key factors explaining the better outcome of the 2008 crisis were, the strengthening of the institutional framework, the quality and efficiency of the regulatory response as well as the historically unique level of international regulatory cooperation, which provided critical liquidity support when needed. Against this backdrop, the Danish mortgage banking model proved its quality as investors continued supporting its bond issuance.

Housing made affordable to everyone

Housing is at the core of the Welfare State. For more than 150 years, housing policies have sought ways to provide Danes with affordable, quality housing.

Modern housing policy was born in the 1850s in Copenhagen. At the time Copenhagen was densely populated as construction outside city walls was prohibited for military reasons. When the demarcation of the city was finally abandoned, the Danish Medical Association took on the task of constructing new housing outside city walls to improve quality of housing and public health by escaping cholera flourishing within city walls. This marked the birth of cooperative housing persisting today.

In the later part of the 1800s Labour unions also began forming mutual housing organisations. Housing organisations were formed to provide housing for working class families outside city walls in parallel to cooperative housing[1]. Housing organisations were formed on the principle of profits be recycled to finance proper maintenance, improvements, and construction of new housing. This marked the birth of public housing.

Public housing attracted political support. In 1917, the first act was passed to introduce subsidies for public housing. The act defined public housing by non-profit housing for public purposes. The passing of the act reflected political consensus that market forces unregulated would not provide affordable, quality housing for all Danes.

Coming out of World War II, housing was in short supply. In the wake of the war, Denmark saw renewed urbanisation and in most cities, supply of housing fell short of demand. The public housing sector was tasked to fill the gap. Construction, taking in industrialised production methods, took off and the number of public housing apartments grew from 71,000 in 1950 to 496,000 in 1990.

The economic expansion of the 1960s made owner occupied housing affordable to more Danes. Working class Denmark left inner city apartments to settle down in their own house in suburban residential developments. In 1950 only 23 percent of Danes owned the home. By 1980 about 60 percent had become homeowners. For the first time, public housing saw challenges in attracting residents.

The construction boom that began in 1950 ended in 1973. The 1973 oil crisis significantly increased both heating costs and transportation costs for Danes to have settled down in suburbia. Unemployment followed in the industrial crisis of the 1970s and new construction slumped. Construction of new houses fell gradually from 1973 reaching a low point only in 1995. Banking deregulation during the 1980s, in combination with weak regulation contributed to financial fragility, but changing social patterns resulting

1 One such example appears on the front page of this report, the *Kartoffelrækkerne* row houses, now converted into single family owner occupied terrace housing

in lower birth rates meant that demand structurally weakened. As population growth turned positive again in the beginning of the 1990s so did construction activity.

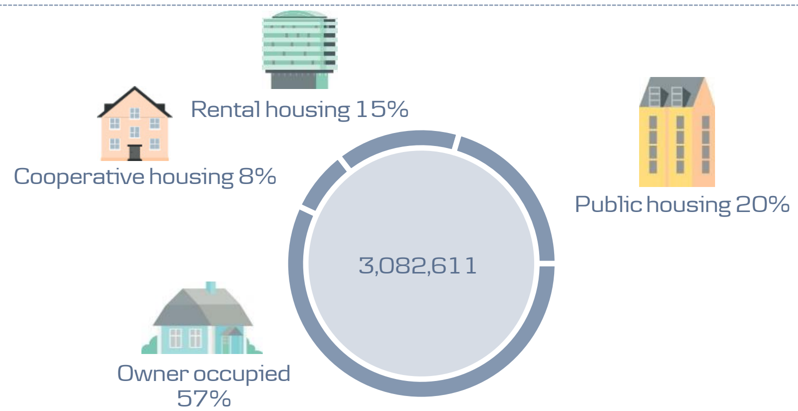
Since the turn of the millennium, Denmark has seen renewed urbanisation and city centre construction has flourished with the exception of the financial crisis years. Danes turning the back on rural areas have spurred political debate on what to do about abandoned housing in rural Denmark and how to better balance living conditions across the entire nation. This topic is by no means specific to Denmark.

Housing policy has not refrained from rent control as a means to provide Danes with affordable housing. Rent control was introduced in 1937 to protect tenants from being overcharged. While passed as a purely temporary mechanism, rent control persisted and rents departed more and more from market equilibria in the decades to follow.

Consequences went beyond keeping rents in check. With rent control, owners of rental housing saw little reason to invest in their properties, the end-result being rental housing of poor quality. In 1996, a law was passed allowing owners to raise rents for new tenants if investing in refurbishments. Since then, rental housing has grown in volume, particularly in inner city areas. It is a key policy concern for the current Government to modify owner's access to raising rents from investing in refurbishments.

Housing stock formed by history

Today's housing market is the result of decades of housing policies and market trends outlined in the above. Denmark's housing stock is multifaceted but structurally similar to the other Nordic countries, which all have a public housing sector of size, while at the same time home-ownership is comparatively high.



Source: Statistics Denmark

Owner occupied housing is at 57 percent of the total housing stock, not far from the EU average at 70 percent. Rental housing at 15 percent of the housing stock is low with public housing and cooperative housing filling the gap at 20 percent and 8 percent of the housing stock, respectively.

The different categories of housing are defined in applicable law.

Owner occupied housing is detached housing, terraced housing, and apartments owned by the resident. The owner is at liberty to sublet the property yet ownership by rental housing companies is prohibited. With few exceptions, owner occupied housing is owned by natural persons.

Most owner occupied housing is subject to a primary residence requirement. This prevents ownership for investment purposes only, unless sublet.

Cooperative housing resembles both owner occupied housing and rental housing. Residents are members of the housing cooperative which takes ownership of the property. With membership follows the right to occupy a specified part of the property and the obligation to pay rent to the housing cooperative. The price of membership, the *Andelskrone*, is set by the general assembly of the housing cooperative as the fair value share of equity with the property valued at par with a rental housing property of same size, quality, and location. For mature housing cooperatives with debts been paid off the price of membership may be at par with the price of owner occupied housing.

When rental housing property is put up for sale, tenants hold the right to form a housing cooperative, if not outbid by a third party buyer.

Cooperative housing is found in city areas primarily. In Copenhagen, cooperative housing provides 30 percent of all housing units.

Rental housing is operated by rental housing companies, primarily. Rental housing is for profit housing, yet rental housing remains tightly regulated. Applicable law stipulates rents cannot exceed the fair value rent of the housing provided under the contract. A rental housing board is mandated to decide on the fair value of the housing provided and if excessive the board is further mandated to order the rent be lowered.

Rental housing is inner city apartments primarily. Rental housing may be converted into cooperative housing, see the above section, however not owner occupied housing.

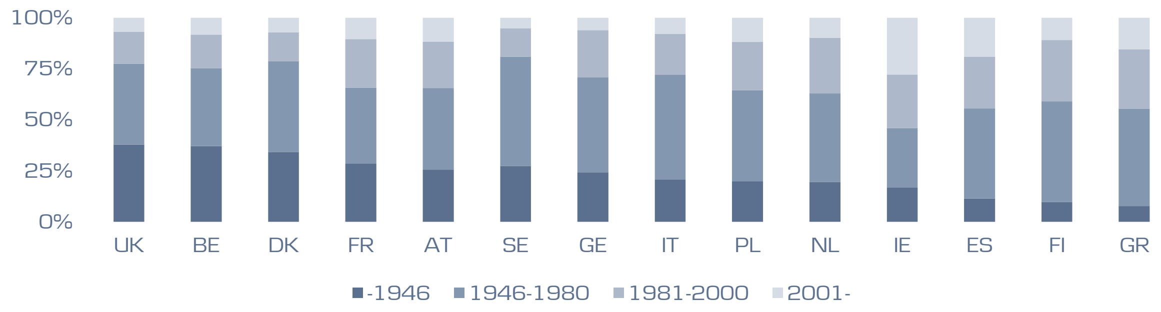
Public housing is operated by non-profit housing organisations. Each housing organisation is governed by a board of tenants mandated to take decisions on maintenance and development of the property whereas the financial management of the housing organisation is the responsibility of a public housing management company.

Public housing is subsidised. Rents are set at 2.8 percent of construction costs per annum. State subsidies cover the gap to actual costs. At present, state subsidies are near zero or even sub-zero from low interest rates keeping financial costs in check.

Rents are adjusted annually by inflation rates. Over time, rents will surpass costs to generate a profit. One third of profits is retained with the housing organisation and two thirds are transferred to the National Building Fund which finances new construction and refurbishments of public housing across Denmark. Further, the National Building Fund supports public housing organisations facing financial difficulties.

Public housing provides accommodation for youth, working families, and the elderly within a broad spectrum of socio economic standing. In general, public housing is more affordable and tenants in public housing qualify for housing subsidies if low income.

The Denmark housing stock is one of the most mature in the EU. The share of housing constructed before 1946 is at 34.1 percent whereas the share of housing constructed since the turn of the millennium is at only 7.2 percent. Copenhagen is even more mature than the national average.

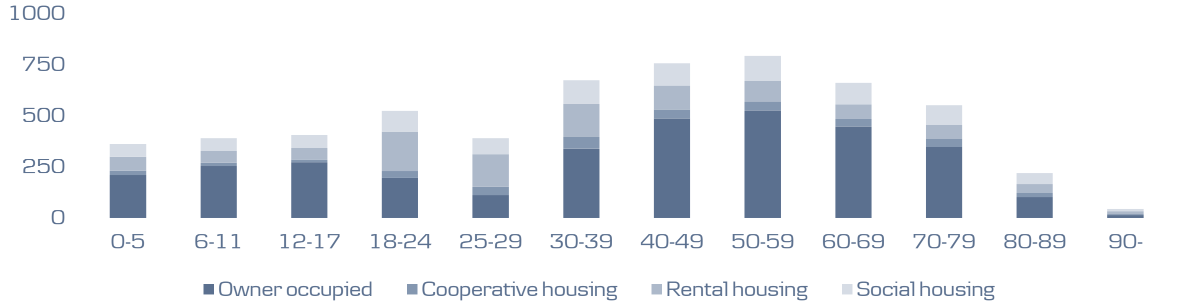


Note: Housing by construction year
Source: Eurostat

While mature, housing in Denmark is also spacious. On average, housing in Denmark is 118.1m² which compares to 96.4m² for EU. Differences in size across the landscape are notable. In rural areas, average size is 135.4m² which compares to 94.8m² in city areas. The same pattern applies to most nations, however not to the same extent.

Note: Average housing size by location, in m²
Source: Eurostat

The diversity of housing offers Danes more opportunities to find a place to live to fit their way of living and their financial situation.

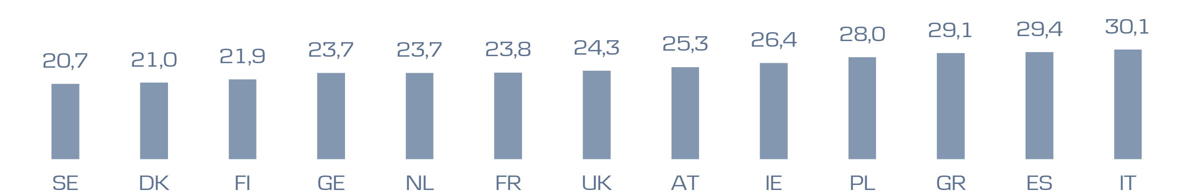


Note: Danes living in owner occupied housing, cooperative housing, rental housing, and public housing by age, in thousands
Source: Statistics Denmark

The majority of Danes live in owner occupied housing. This applies to most age groups except the 18 to 30 year old.

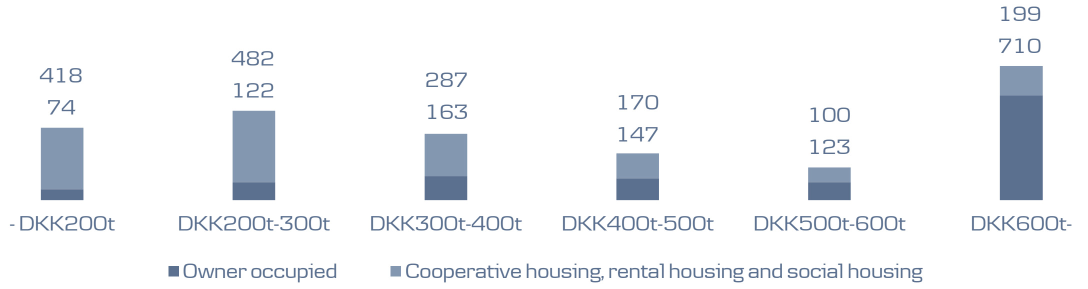
To the age of 21, Danes live with their parents. At 21, the average Dane leave the parents to live in rental housing or public housing which include student dorms. At 30 to 35, the average Dane is likely to invest in owner occupied housing for the first time. From then on, the average Dane is likely to »climb the property ladder« and move to more spacious housing as the family size grows. Late in retirement, the average Dane leaves owner occupied housing to occupy rental housing or public housing which includes senior housing and nursing homes.

One measure of housing accessibility is the age at which young people leave their parent home. Of course tradition, family structure and employment also have a saying, yet leaving early as a firm indication that affordable housing is available.



Note: Age in years at which young people leave their parent home
Source: Eurostat and Finance Denmark

Residents in owner occupied housing is predominantly high income. Whereas low income families tend to occupy cooperative housing, rental housing, or public housing, high income families are in demand for owner occupied housing. For the highest income group considered nearly 80 percent reside in owner occupied housing.



Note: Families living in owner occupied housing and non-owner occupied housing by family income, in thousands
Source: Statistics Denmark

Public housing provide accommodation for the income poor, however, this is only part of the story. Also mid-income families reside in public housing. Please note, the below chart groups income by personal income and not family income. Further, one in three residents in public housing in the age group 18 to 64 years live on social welfare whereas for Danes in general, it is one in ten.

Note: Persons living in public housing by personal income, in thousands

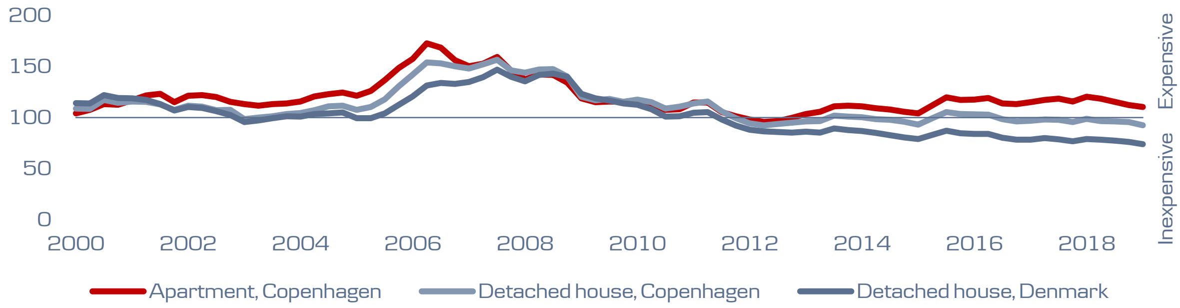
Source: National Building Fund, 2018

What say the Danes on affordability

Danes spend more on housing than previously. Whereas 9 percent of total consumption were for housing purposes in 1966, today's share is close to 25 percent. In an EU comparison this is high, though comparable numbers are not at hand across the EU.

The greater share of consumption spend on housing reflects house price inflation, yet it also reflects housing is perceived a luxury good. The more we earn, the more we are inclined to spend on housing as other needs are satisfied.

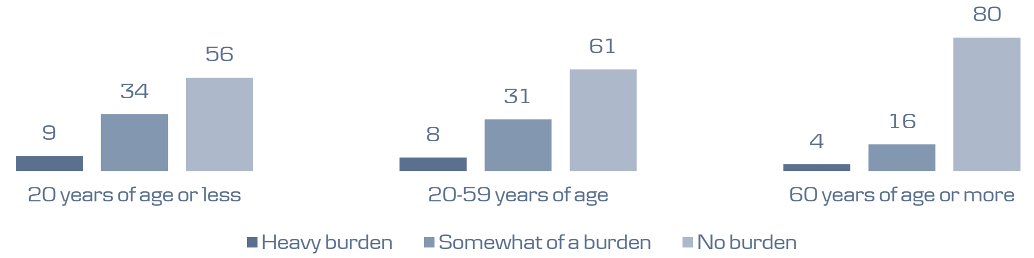
Housing affordability fluctuates with house prices and interest rates. Affordability was severely stressed when the financial crisis broke combining high house prices with high interest rates. Since then, lower interest rates have eased the burden of living.



Note: Homeowner affordability, index, 30 year average equals 100

Source: Realkredit Danmark

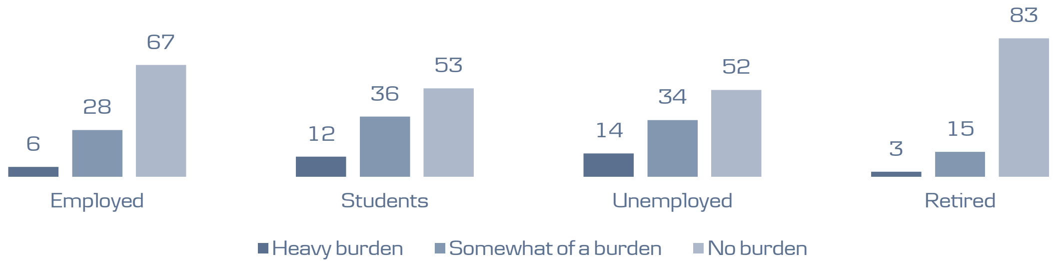
Welfare surveys suggest Danes assess their current housing at reasonably affordable. Further, housing affordability improves with age. Whereas 9 percent of Danes aged 20 or less think housing costs are a heavy burden to bear only 4 percent of Danes aged 60 or higher thinks the same. Four in five aged 60 or more think housing costs are no burden at all.



Note: Share of households by response, in percent

Source: Statistics Denmark

Affordability is stressed for students and unemployed at the most. 12 percent of students think housing costs are a heavy burden whereas 53 percent think housing costs are no burden at all. For unemployed the equivalent numbers are 14 percent and 52 percent, respectively.



Note: Share of households by response, in percent

Source: Statistics Denmark

Financing owner-occupied housing, cooperative housing, rental housing and public housing

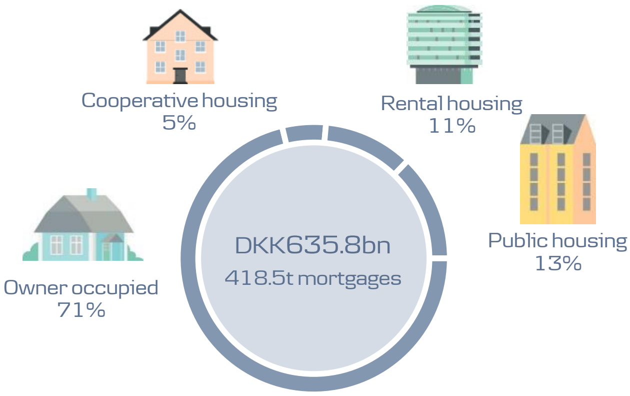
Realkredit Danmark provides mortgage finance to all categories of housing across Denmark. At nearly 80 percent of the mortgage book, housing is our primary segment.

We mortgage owner occupied housing to a maximum of 80 percent of the property market value for primary residence and 75 percent for leisure homes. We offer our services to customers with Danske Bank and to Realkredit Danmark only customers and we service our customers through branches, online and via real estate agency home.

We mortgage housing cooperatives to a maximum of 80 percent of the property market value. We provide mortgage finance to the housing cooperative rather than the individual members which may resort to universal banks for financing their membership.

We mortgage rental housing to a maximum of 80 percent of the property market value. We mortgage rental housing provided a high rate of occupancy.

We mortgage public housing against State guarantees. State guarantees were introduced in 2017. Until then, local authorities provided a guarantee for the part of the mortgage extending beyond 60 percent of the market value of the property. The State introduced a full guarantee scheme to lower the combined funding costs. Bear in mind, the State carries the marginal financing costs. Further, the State took over the funding market operations as the State purchases covered bonds issued for the funding of public housing for the purpose of back-to-back funding by public debt issuance. In effect, mortgage banks became operators rather than lenders of public housing debt.



Source: Realkredit Denmark

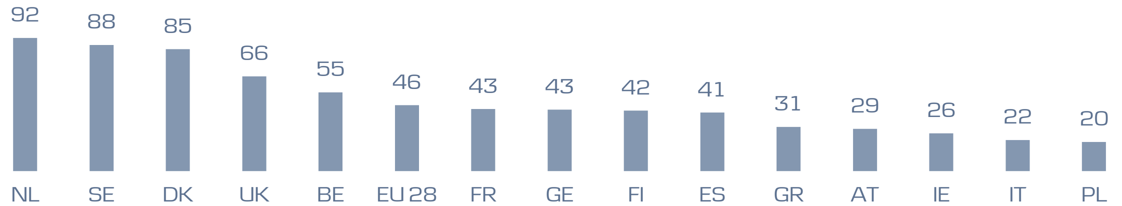
We offer the same range of mortgages to all housing segments. Mortgages come with a maximum term-to-maturity of 30 years, amortising or interest only, and with interest fixed for three months up until maturity. In doing so, we maximise the liquidity of covered bonds outstanding at the benefit of mortgagors.

Denmark leveraged

Mortgage debt is substantial. Ongoing discussions pivots on whether Danes are over indebted.

Denmark stands out in more than one way. A larger share of total debt is mortgage debt in Denmark. One reason may be the accessibility and low-cost of mortgage financing compared to other financing in Denmark. Further, more Danes live in urban areas where house prices are high. Home ownership therefore requires more debt.

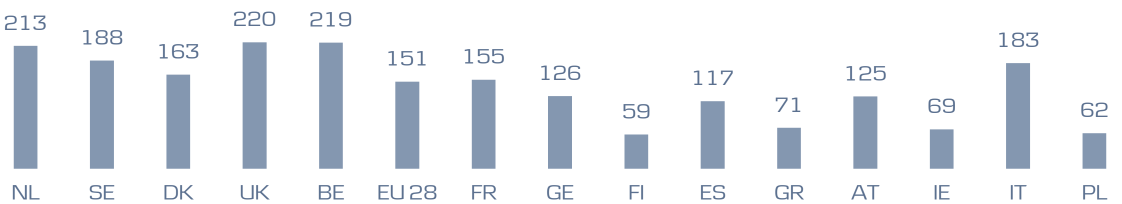
Discussions often mention total mortgage debt to GDP at 133 percent of GDP, end 2018. In doing so, mortgage debt financing housing cooperative, rental housing, public housing, agriculture, and companies and organisation is included which, in peer nations, often tend to be financed by non-mortgage debt. Adjusting for this, the mortgage debt burden falls significantly.



Note: Outstanding residential debt to GDP, in percent
Source: European Mortgage Federation and European Central Bank

European Mortgage Federation Statics measures outstanding residential debt, of which the vast part is mortgage debt, at 84.6 percent of GDP which brings Denmark in line with the Netherlands and Sweden. EU average is measured at 45.7 percent.

Debt is one side of the coin. Adjusting for financial assets such as deposits, securities holdings, and pension fund savings, we arrive at net financial wealth. By this measure, Danish households do not come out as over indebted but rather leveraged with net financial assets at 163.2 percent of GDP.



Note: Net financial assets, in percent
Source: Eurostat

A fair point often raised is that pension savings are difficult to monetise to service mortgage payments in the event of financial stress. A fair share of financial assets therefore needs to be held in liquid format when leveraged.

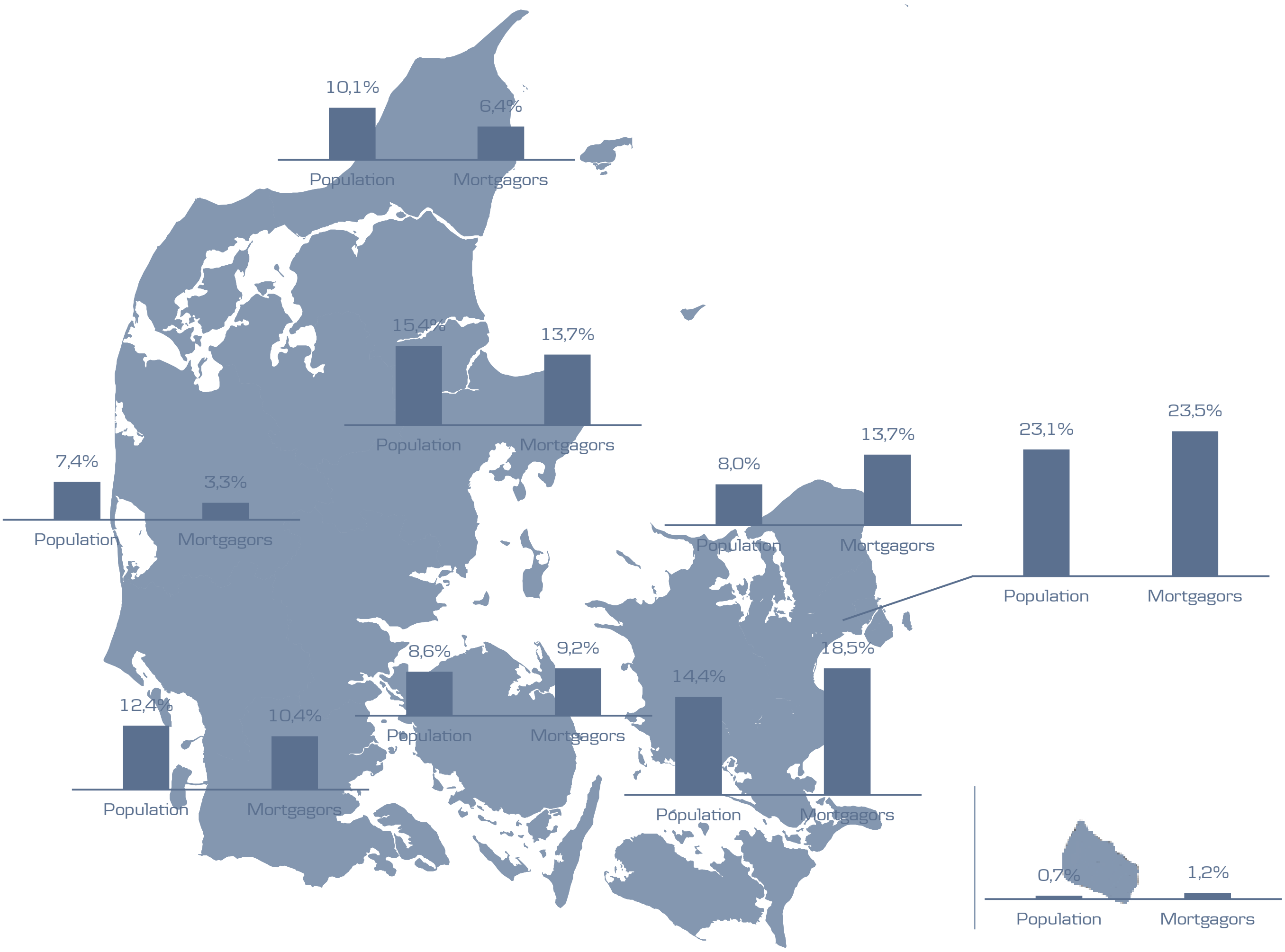
Financing all of Denmark

Though geographically small, Denmark sees greater dispersion between urban and rural areas.

At Realkredit Danmark, we have an ambition to be present in all parts of Denmark in both rural and urban areas. We do not operate any kind of »red line« credit policy whereby properties in some areas are out of scope for mortgage finance. We offer mortgage finance on par terms to customers in rural and urban areas.

Mapping our customers relations across Denmark, we find a moderate overweight of customer relations in Eastern Denmark and a moderate underweight in Western Denmark. To this end, we note both Eastern and Western Denmark be partly urban, partly rural.

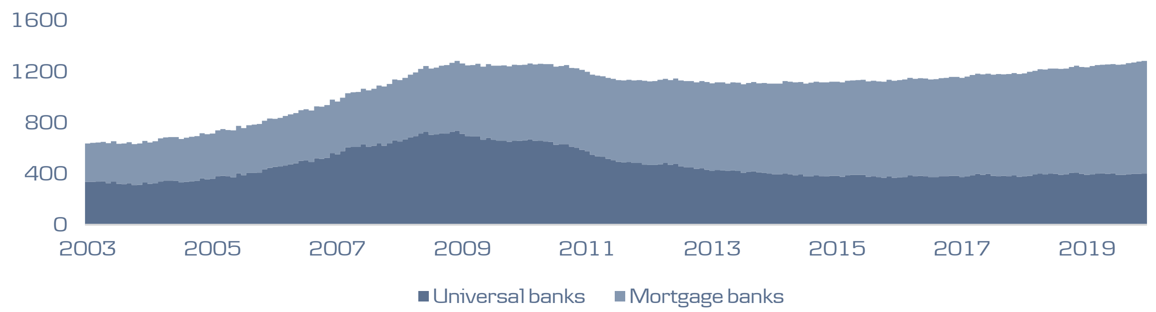
In the below chart, we split both population and Realkredit Danmark mortgagors across the different parts of Denmark. We split by number of mortgagors rather than by mortgage volumes. Housing tends to be more affordable in rural areas and, consequently, it would come as no surprise that mortgage lending by volume is more urban.



Source: Statistics Denmark and Realkredit Danmark

Financing growth and prosperity

Mortgage is not only the preferred source of financing for homeowners. More than two thirds of lending to non-financial companies and organisations[2] is mortgage lending.



Note: Lending to non-financial companies and organisations, in DKKbn
Source: Central Bank Statistics

Before the financial crisis broke, universal banks were the primary lenders to non-financial companies. With the financial crisis, universal bank funding dried out and lending volumes contracted. Covered bond markets, on the other hand, remained open to mortgage banks and they continued to provide mortgage finance to non-financial companies filling the supply gap.

In providing mortgage finance to non-financial companies and organisations, mortgage banks finance growth and prosperity. Non-financial companies and organisations depend on access to financing to invest and to grow their operations.

Mortgage finance offers long-term credit commitments. This allows non-financial companies and organisation to plan and invest long-term which further supports growth and prosperity.

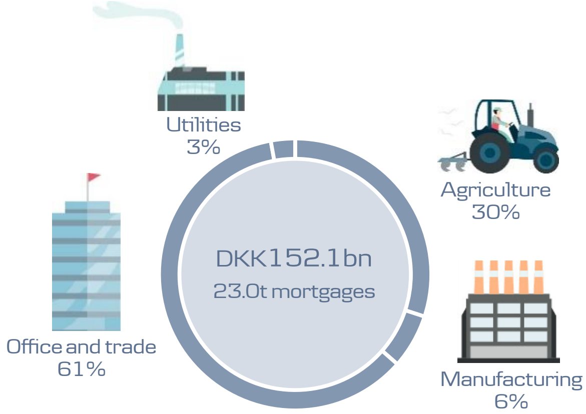
At Realkredit Danmark, we provide mortgage finance to agriculture, manufacturing, utilities, and office and trade which further includes hotels, shopping centres etc.

We mortgage agriculture to a maximum of 60 percent of the market value of the property and farming land. We distinguish between agriculture and housing at land size of 10 acres.

We mortgage manufacturing and office and trade to a maximum of 60 percent of the market value of the property.

2 This includes housing companies

We mortgage utilities to a maximum of 60 percent of market value. One fourth of utilities mortgaged is renewable energy, one fourth is mixed energy which may include fossil fuels, and two fourths are distribution and trading of energy.



Source: Realkredit Danmark

We offer the full range of mortgages to all non-financial company customers. Customers within these segments are more often in demand for floating rate mortgages. Further, we offer mortgages with currency denominations in SEK and NOK to Swedish and Norwegian customers, respectively.