

DANMARKS NATIONALBANK

2 JULY 2021 — NO. 16

Housing market robustness should be strengthened

- The pandemic has increased Danes' preference for housing. This has led to increased trading activity and house price increases that have been larger than what e.g. incomes and interest rates would suggest.
- Increased preferences for housing lead to extraordinary uncertainty about the future course of the housing market. However, a dampening of price increases is expected. By the end of 2023, house prices are expected to have risen significantly above the level expected before the pandemic.
- Measures are needed now that can strengthen the robustness of the housing market, such as amortisation requirements for the most indebted homeowners and lower interest deductions. This will reduce the vulnerability of the housing market and strengthen the robustness of the Danish economy today and in the future.

Developments on the housing market have been unusual since the outbreak of the pandemic in March 2020. Prices have increased markedly despite lockdowns that have resulted in large, temporary economic downturns. Price increases have been larger than what the development in incomes and interest rates would suggest. However, lockdowns and restrictions have meant that households have spent significantly more time in their own home, which has increased their preference for housing.

There is substantial uncertainty about how house prices will develop in the coming years as a similar event with a pandemic and lockdowns has not occurred in recent times. By the end of 2023, house prices are expected to have risen markedly above what was expected before the pandemic.

In the projections for house prices in the Outlook for the Danish Economy, June 2021, it is assumed that the price increases will decline gradually as they match demand and the pandemic loosens its grip. Specifically, the projection scenario assumes a price increase for single-family houses of 14 per cent in 2021, 6 per cent in 2022 and 1 per cent in 2023. The development should be seen in light of the Danish economy moving towards a mild boom with a further improvement in household finances.

Meanwhile, there is great uncertainty about developments over the coming years, and there is a substantial risk of even higher price increases, or developments where prices fall slightly. More pronounced

price increases may be set off by accumulated demand or even self-fulfilling expectations of future price increases. More moderate developments can be tied to a more temporary nature of the driving forces of the housing market under the pandemic.

Even with a more moderate price development in the near future, conditions for increased leveraging and increased consumption and housing investment, are in place. This would make the economy more vulnerable towards a larger correction of house prices at a later point in time. All in all, there are greater risks related to stronger price increases in the coming years than to a situation with moderately decreasing prices.

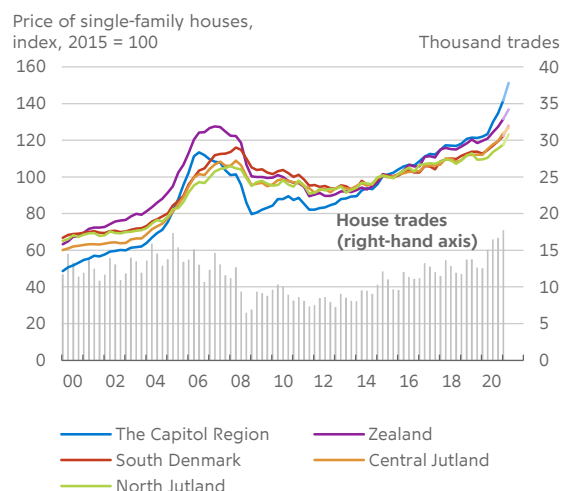
On parts of the housing market, the high pace has already led to signs of risk building. In Copenhagen and surroundings in particular, lending is increasing while at the same time prices have increased here the most. Build-up of risk following the developments in Copenhagen and surroundings and other larger cities may spread to the rest of Denmark. This gives rise to increased vigilance.¹

Some politically decided structures weigh on the robustness of the housing market and have stimulated price increases before and during the pandemic. The current housing taxation does not reduce price volatility, and broadly accessible interest-only mortgages and high interest deductibility incentivise households to take on debt. An amortisation requirement for the most indebted homeowners will generally reduce the vulnerability of the Danish economy towards large housing market fluctuations. Furthermore, a reduction of interest deductions will lower incentives to take on debt. This reduces the risk of building up large imbalances and increases the robustness to housing market fluctuations.

It is a good time to implement actions that make the housing market and the Danish economy more resilient today and in the future, as interest rates are low and the economy is heading towards a mild boom. At the same time, it will reduce the risk that the current developments in the housing market are amplified by more permanent shifts in the prefer-

Continued high pace on the housing market

Chart 1



Note: Nominal prices for single-family houses. The faded lines in the last quarter represent a projection of house prices from Statistics Denmark based on the most recent figures from Boligsiden.

Source: Statistics Denmark, Boligsiden and own calculations.

ence for housing or self-fulfilling expectations about house price increases.

High paced housing market despite temporary downturns in economic activity

The rapid developments on the housing market since summer 2020 have continued into 2021. There have been large price increases and many housing transactions across Denmark, see Chart 1. This has reduced the amount of homes for sale, and time on the market has been reduced markedly. Traditionally, there is a high correlation between the development on the housing market and economic activity, and house prices fell during the first lockdown of Danish society. However, following this, prices have increased substantially despite another large, tem-

¹ See Danmarks Nationalbank, Build-up of risks in credit institutions, *Danmarks Nationalbank Analysis (Financial Stability — 1st Half 2021)*, No. 12, May 2021.

porary economic downturn and heightened uncertainty about the future.

In aggregate, prices have already increased 15 per cent and 14 per cent for single-family houses and owner-occupied apartments, respectively, from the 2nd quarter of 2020 to the 2nd quarter of 2021.² The pace is highest in and around the capital, where prices of houses and apartments have increased by 21 per cent and 16 per cent, respectively, over the same period. The high pace is seen across housing markets in Europe and the USA, see Chart 2. However, in these economies, prices have increased the most in suburbs and rural districts, which stands out somewhat from developments in Denmark.

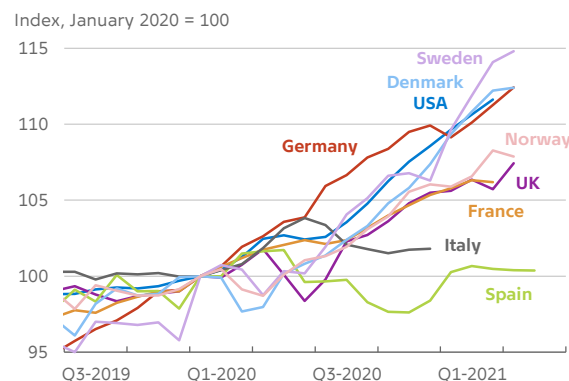
House prices are increasing faster than incomes and interest rates would suggest

The economic downturn in Denmark and abroad during the pandemic is expected to put downward pressure on house prices on its own. However, a range of circumstances has temporarily underpinned price increases since the outbreak of the pandemic, see Chart 3. Interest rates have been low and falling leading up to and during the pandemic. This stimulated house prices throughout 2020. Long interest rates are today slightly higher than before the pandemic, but there is typically a time lag in the pass-through of mortgage rates to house prices, and changes in interest rates in recent years are still expected to stimulate house prices. Furthermore, household incomes have been supported through the pandemic by different relief packages.

The house price increases have, however, been substantially higher than what can be explained by traditional house price models, see e.g. Chart 3.³ This can be related to the downturn in economic activity largely having affected employment among households that are less likely to acquire homes, however, this cannot explain developments on its own.⁴ Possi-

House price increases are also found abroad

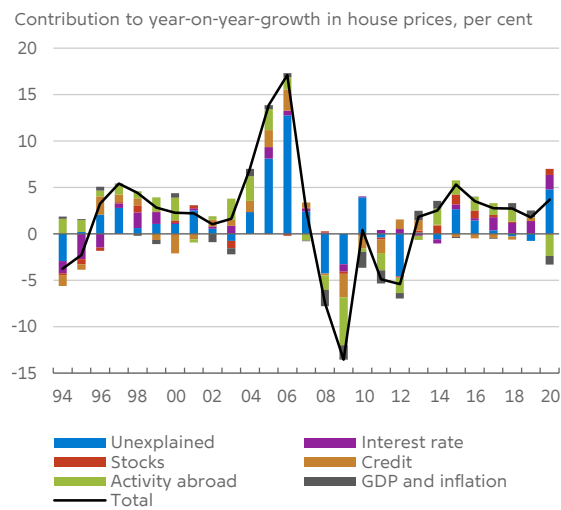
Chart 2



Note: Real house prices.
Source: Macrobond, Boligsiden and own calculations.

Large parts of house price developments cannot be explained by fundamental factors

Chart 3



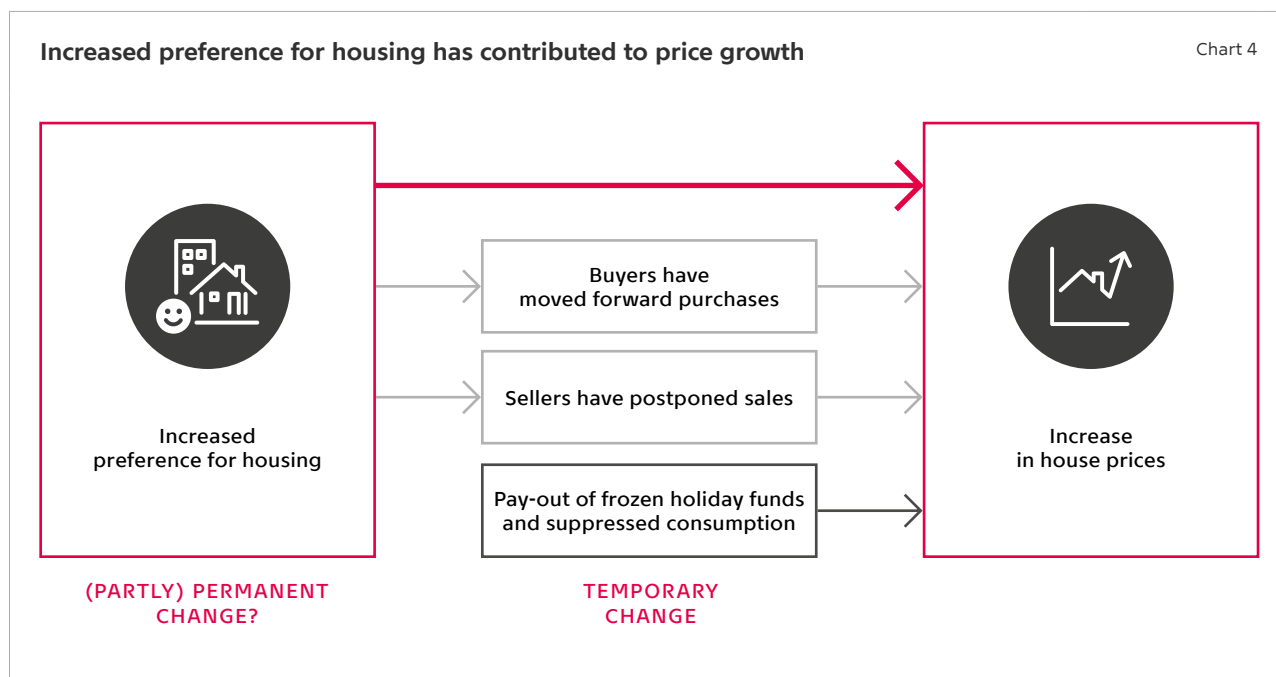
Note: The chart shows contributions to annual growth in house prices. The unexplained part (blue bars) reflects the part of house price developments that has taken place beyond developments in interest rates, credit, stocks, GDP, inflation in Denmark, activity abroad and export market prices and oil prices. Calculations are based on a macroeconomic model, see Jensen and Pedersen, Macro-financial linkages in an SVAR-model with applications to Denmark, *Danmarks Nationalbank Working Paper*, No. 134, January 2019.

Source: Danmarks Nationalbank.

² The figures for the 1st quarter of 2021 from Statistics Denmark have been projected for the 2nd quarter of 2021 based on the developments in house price from Boligsiden in April and May.

³ The unexplained part of house price developments in Chart 3 is only slightly lower if the SVAR-model is estimated with household disposable income instead of GDP.

⁴ See Svend Greniman Andersen, Simon Juul Hviid and Agnete Gad Knudsen, Moderate setback on the housing market, *Danmarks Nationalbank Economic Memo*, No. 5, June 2020.



ble explanations could be a change in preferences or behaviour driven by expectations.⁵

The pandemic has increased housing demand

Lockdowns and restrictions during the past 16 months have meant that Danes have spent markedly more time in their homes. This increases the value that households associate with housing. As supply of housing cannot react to increased demand in the short term, this increase in demand will lead to increasing prices. At the same time, side effects and temporary circumstances have underpinned developments. These effects are illustrated in Chart 4 and are described in the following.

An increased value associated with housing is not directly measurable. However, a range of factors point towards an increased preference for housing under the pandemic. First of all, house prices have increased substantially. Furthermore, households have had a relatively large consumption of housing-related goods and services. An American study

further shows that working from home in itself increased homeowners' preference for their homes, and that the effect is largest around the biggest cities.⁶

The increased preference for housing is expected to have affected potential home buyers across the life cycle. That is the graduate, who would like more space than a rented room can offer, the family, who could use an extra office space, and the older household that is thinking about moving to a smaller space or even to leave the housing market but which has preferred to keep their garden space a little longer under the pandemic.

An increased value associated with housing is consistent with the pace on the housing market having been highest in the capital region. This is where the extent of working from home has been largest due to the employment composition, and because the risk of infection in larger cities is higher as the population density is higher. This may have stimulated

⁵ See Yunhui Zhao, US Housing Market during COVID-19: Aggregate and Distributional Evidence, *IMF Working Paper*, No 2020/212, September 2020.

⁶ See Morris A. Davis and Andra C. Ghent, The Work-from-Home Technology Boon and its Consequences, *NBER Working paper*, April 2021.

housing demand in and around the capital region more than in the rest of Denmark.⁷

That house prices increase as a consequence of the pandemic is further underlined by corresponding house price developments in countries with coronavirus restrictions similar to those adopted in Denmark.

The future development of house prices depends greatly on how permanent and large the preference for housing is. The change in preferences may be more temporary if it is closely related to lockdowns and restrictions, and the same will then be the case for price increases. This could e.g. apply to the school teacher who has been teaching from home during the pandemic but who will return to classroom teaching after the pandemic. If, however, the pandemic has caused structural changes to the way we live our lives, the change in preferences could be more permanent. This could e.g. be among parts of the population that are employed in offices where working from home is expected to play a larger part in working life. This may imply an upward pressure on prices which is reduced gradually as the housing stock adapts.

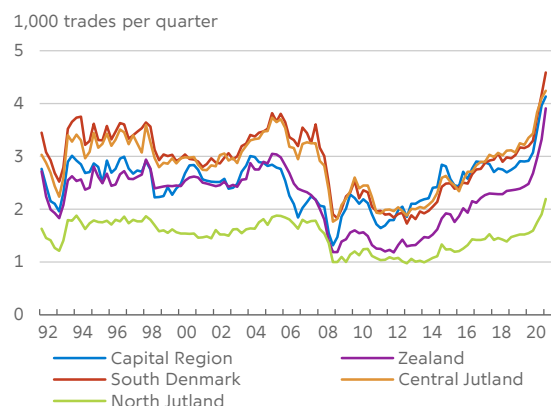
Home purchases and sales are among the most important financial decisions that many homeowners face in life. Decisions are often associated with large costs – both financial and non-financial such as time, energy and uncertainty. For this reason, home purchase/sale is often a rare occurrence for a household where expectations of future needs and financial capabilities play a large part. A greater preference for housing in general increases the possibility that the gains of buying a home exceed the costs.

Potential home buyers are expected to move forward home purchases

The increased preference for housing will in itself lead to a higher trading activity. However, this effect may be amplified by a group of households that had thoughts of buying prior to the pandemic. Even if

Marked increase in trading activity

Chart 5



Note: Trades with single-family houses.
Source: Statistics Denmark.

these potential buyers do not expect to spend more time at home after the pandemic, they can choose to bring forward their home purchases as a consequence of temporary circumstances during the pandemic, such as lockdowns and restrictions. Costs associated with searching for housing can even have been reduced, as restrictions have hampered other activities. This side effect from an increased preference for housing is expected to have amplified trading activity and price increases.

This may contribute to explaining that trading activity has increased substantially during the pandemic and is at its highest level since the 1980s, see Chart 5. The increase in trading activity also shows among first-time buyers, with an increase of 17 per cent in 2020.⁸ Moving patterns further underpin that bringing forward of decisions is taking place. Home buyers that moved from Copenhagen in 2020 moved to proportionally the same municipalities as in 2019 – but more people moved.⁹ As such there are not signs that home owners demand a fundamentally different type of home when it comes to the geographical location.

⁷ A similar pattern is found in large American cities where, however, activity has been lower in the most central parts. See Nick Bloom and Arjun Ramani, The donut effect: How COVID-19 shapes real estate, *Policy Brief*, Stanford Institute for Economic Policy Research, May 2021, and Christopher T. Stanton and Pratyush Tiwari, Housing Consumption and the Cost of Remote Work, *NBER Working Paper*, February 2021.

⁸ See Maria Hohnen, Antallet af førstegangskøbere steg med 17 pct., Danmarks statistik, Bag Tallene, 2021.

⁹ See Statistics Denmark's figures for moves.

Home sales may have been postponed

A homeowner may wish to sell for many reasons. It could be e.g. adapting to new needs, health issues, divorce or unemployment. One group of sellers is relevant to consider here: households that prior to the pandemic were thinking about moving either to a smaller place or to rented accommodation. As the value associated with housing has increased during the pandemic, these potential sellers may have been more hesitant to sell at a given price. This may help explain why the volume of homes for sale has not increased to the same extent as housing transactions, despite increasing prices, see Chart 6, and that time on the market has decreased substantially.

The increased value associated with housing and the intertemporal shift in relation to purchases and sales are expected to be central explanations for the unusual house price growth during the pandemic. The value associated with housing has increased, attracting more buyers to the market who must compete for increasingly fewer houses for sale.

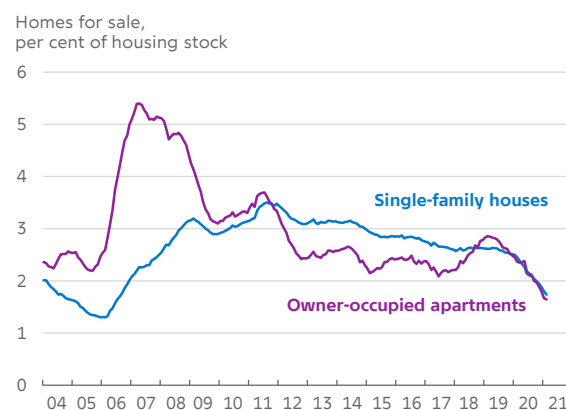
The change in preferences for housing may be temporary or permanent. However, the temporary effects from the intertemporal shift in trading patterns cannot. This implies that there will be a tendency for movements in the opposite direction on the other side of the pandemic, all things being equal, where more homes are put on the market while the number of buyers is reduced following the currently high trading activity.

Other temporary factors amplify price growth during the pandemic

A number of other circumstances have further contributed to amplify the house price increases seen over the past year. Restrictions have made a range of services unaccessible. Consumption has thus been suppressed.¹⁰ This may have directed consumption to other goods and assets, such as housing.¹¹ The pay-out of frozen holiday funds has further increased household liquidity. This has left more

Limited amount of homes for sale over the past year

Chart 6



Note: It is noted that, during the pandemic, there has been a larger number of sales not listed, which are not included in the chart.

Source: Statistics Denmark and own calculations.

room in household budgets and enabled home purchases.

At the same time, further decrease in interest rates on household deposit accounts on average, and in particular negative interest rates on large deposits, may have contributed to home purchases being brought forward.¹² While the interest rate level is presumed to remain low for a long period of time, changes to the banks' thresholds for deposits that are subject to negative interest rates over the past six months may have amplified the reaction of households to the interest-rate level.

Self-fulfilling expectations may effect house prices

The unexplained house price increases is approaching the level of the years leading up to the housing bubble in the mid-00s, where price developments were clearly out of line with economic conditions, cf. Chart 3. That in itself gives rise to increased attention.

¹⁰ See Svend Greniman Andersen and Rasmus Mose Jensen, High savings during corona were driven by restrictions rather than precautionary consumers, *Danmarks Nationalbank Economic Memo*, No. 2, February 2021.

¹¹ See Danmarks Nationalbank, Danish economy is heading for a mild boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 15, June 2021.

¹² See Rasmus Kofoed Mandsbjerg, Alexander Meldgaard Otte and Morten Spange, The response of private customers to negative deposit rates, *Danmarks Nationalbank Analysis*, No. 9, April 2021.

There are clear signs under the housing bubble in the mid-00s that the development was driven by speculation about future price increases. This can e.g. be seen by Danmarks Nationalbank's bubble test, which indicates that house prices were driven by self-fulfilling expectations in the years leading up to the financial crisis, see Chart 7. The introduction of variable interest and interest-only mortgages in the preceding years contributed to this development. In the same period the housing burden increased substantially.

In general, it is difficult to measure the degree of speculation in the form of self-fulfilling price expectations on the housing market. Examples of this kind of speculation could be buyers that act out of fear of missing out as prices are increasing. This may be rational in the short run, but most often it is hard to know when developments change, until it is too late. Indicators for speculative behaviour, such as Danmarks Nationalbank's bubble test, do not show signs of speculation at the moment, and thus this does not seem to be the primary driver of developments under the pandemic.

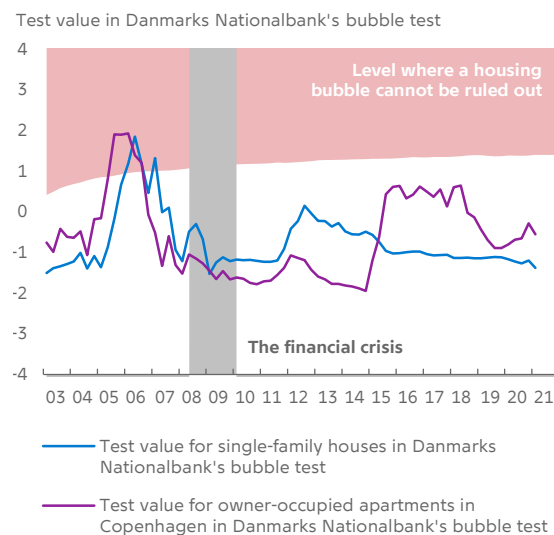
If everyone expects increasing prices, this may in itself give rise to price increases. An American study illustrates that such expectations about house price increases give rise to increased house prices but also increased indebtedness and consumption. This is consistent with developments leading up to the financial crisis. The study further finds that an increased preference for housing increases house prices, but does not lead to higher consumption.¹³ This also indicates that self-fulfilling expectations are not the most prominent driver behind developments on the housing market during the pandemic.

Increased uncertainty about house prices in the coming years

As the pandemic loosens its grip on Denmark and the rest of the world, the Danish economy

Self-fulfilling expectations drove house prices leading up to the financial crisis

Chart 7



Note: The bubble test is based on an index which corrects nominal house prices for developments in fundamental factors such as income, interest rates and housing stock. The index is applied to a test for rational, self-fulfilling speculative bubbles. See Simon Juul Hviid, A leading indicator of House-Price bubbles, *Danmarks Nationalbank Working Paper*, No. 114, April 2017.

Source: Danmarks Nationalbank.

is expected to head towards a mild boom. This will underpin house price developments over the coming years. In light of the unusual price increases of the past year, it is equally important how the pandemic is expected to affect housing demand in the years to come. There is significant uncertainty about this, especially because the increased preference for housing is not directly measurable. The price developments give a good indication, but there is not an adequate experience base from previous pandemics.

Uncertainty about the effects of the pandemic on future house price increases

For the assessment about future developments of house prices there are especially two unknown, but important, factors one must make assumptions

¹³ See Greg Kaplan, Kurt Mitman and Giovanni Violante, The Housing Boom and Bust: Model Meets Evidence, *Journal of Political Economy*, vol. 128, No. 9, September 2020.

about: how large and how permanent the increased preference for housing is and how much this has already been priced in.

How much of the increased preference for housing is priced in today is uncertain. It could be that there currently is a built-up demand pressure that has not yet led to trades because of the limited supply available. However, increasing house prices will gradually counter this pressure as the price level balances with demand.

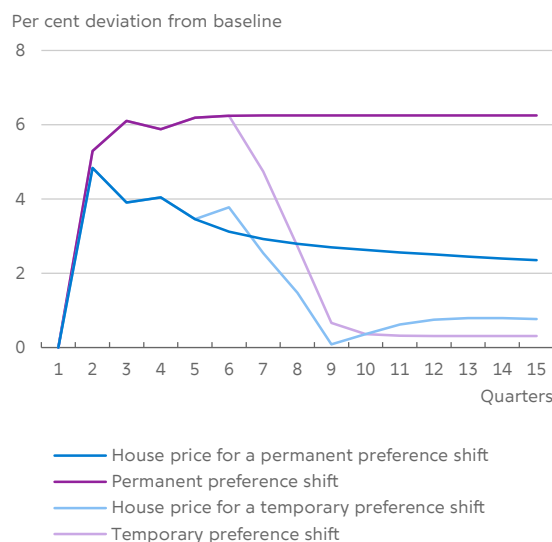
Price increases as a result of a preference shift – whether temporary or permanent – are followed by a correction, all else being equal. This is shown by e.g. simulations on Danmarks Nationalbank's DSGE model, see Chart 8. Here, the preference shift is calibrated to match the unexplained price development in 2020, see Chart 3. If the preference shift is temporary, house prices will fall back as preferences return to their initial state. If the preference shift is more permanent, prices are lifted until the housing stock adapts and dampens prices. The extent of house price increases, and the following correction, thus depends on how large and permanent the preference shift is.

Variations in assumptions about the size and duration of the preference shifts illustrate an interval for how house prices could evolve, see Chart 9. The shaded area is determined by two scenarios. The upper limit illustrates a permanent preference shift where the price level gradually balances with demand towards the summer of 2022. This implies that the increased preference for housing is not yet fully reflected in prices, as there are potential buyers that have not yet acted on their preference shift. The lower limit illustrates a scenario where demand patterns, including housing demand, return to normal as vaccines are rolled out and society reopens. The preference shift is thus solely temporary, and the extent of the preference shift is already priced in.

In both the upper and lower limits, there are larger price increases during the pandemic as a result of an increased preference for housing and temporary factors such as suppressed consumption and increased liquidity among households. House price growth moderates as these temporary factors disappear and the price level gradually balances with demand.

Preference-driven house price increases are followed by corrections

Chart 8

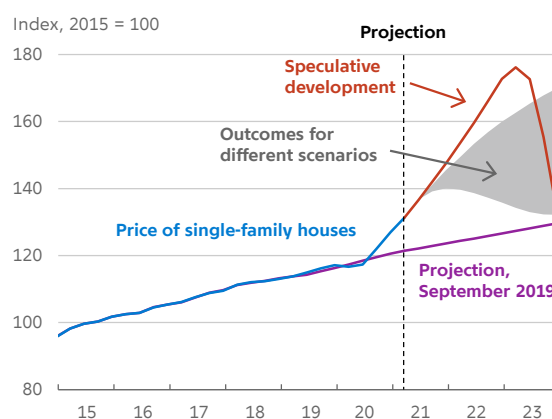


Note: Calculation based on Danmarks Nationalbank's DSGE model. Note that effects of the preference shift pass through faster than frictions on the housing market would suggest. See Jesper Pedersen, An estimated DSGE-model for Denmark with housing, banking, and financial frictions, *Nationalbank Working Paper*, No. 108, October 2016.

Source: Danmarks Nationalbank.

Uncertainty about the development of house prices

Chart 9



Source: Danmarks Nationalbank.

Working from home will continue to some extent after the pandemic

Box 1

The pandemic may have led to structural changes in the way we live, beyond the pandemic itself. In the future, working from home will potentially play a greater role than before the pandemic. This may increase the preference for housing permanently.¹ The magnitude and effect of such a change is not directly measurable. However, there are several studies that address the implications of the pandemic.

An American study shows, among other findings, that working from home in itself increases homeowners' appreciation of their home, and that this effect is greatest around large cities.^{2,3} Another study shows that 40 per cent of working from home during the pandemic is expected to continue after the pandemic.⁴ This corresponds to a quadrupling compared to the period before the pandemic. The studies also find that working from home is most prevalent among highly educated people, and that approximately 60 per cent of the respondents have worked from home during the pandemic. In Denmark, 28 per cent of those employed worked at home during the winter lockdown.⁵ There may be several reasons why working from home will continue to some extent after the pandemic has loosened its grip. Technological developments, increased human capital and declining stigma support this, as well as increased flexibility

for the employees and reduced time spent on commuting. However, there are also costs for both the employees and the companies associated with working from home, which can pull in the opposite direction. A study of an Asian company shows that working from home during the pandemic has led to a 30 per cent increase in hours worked - 18 per cent outside normal working hours - but that productivity has fallen by 20 per cent. This is due to a greater need for meetings and coordination at the same time as the amount of uninterrupted working hours has decreased.⁶

Before the pandemic, few had expected the world to be hit by a pandemic to the extent that it has unfolded. However, everyone knows today that outbreaks of pandemics may occur and that the consequences can be great. This could be in the form of new, more infectious mutations of covid-19, or other completely new viruses. To the extent that this is embedded in the expectation formation of households, it may mean that home buyers change their housing preferences more permanently for precautionary reasons. It is well known from other literatures that when a scenario that was previously expected to be improbable has unfolded once, it can influence households' decisions long into the future. An example is precautionary saving up due to income risk.

1. Yunhui Zhao, US Housing Market during COVID-19: Aggregate and Distributional Evidence, *IMF Working Paper*, No. 2020/212, September 2020.
2. Morris A. Davis and Andra C. Ghent, The Work-from-Home Technology Boon and its Consequences, *NBER Working paper*, February 2021.
3. Nick Bloom and Arjun Ramani, The donut effect: How COVID-19 shapes real estate, *Policy Brief*, Stanford Institute for Economic Policy Research, January 2021, and Christopher T. Stanton and Pratyush Tiwari, Housing Consumption and the Cost of Remote Work, *NBER Working Paper*, February 2021.
4. Barrero et al., Why Working from Home Will Stick *NBER Working Paper*, No. 28731, April 2021, and Bick et al., Work from Home Before and After the COVID-19 Outbreak, *Federal Reserve Bank of Dallas Working Paper*, No. 2017, February 2021.
5. Danmarks Statistik, Beskæftigelsen faldt i første kvartal, *Nyt fra Danmarks Statistik*, nr. 228, June 2021.
6. See Gibbs et al, Work from Home & Productivity: Evidence from Personnel & Analytics Data on IT Professionals, *IZA Discussion Paper Series*, No. 14336, May 2021.

Expectations of future price increases can become self-fulfilling

The interval in Chart 9 illustrates variations in assumption of the size and persistence of the preference shift. Another course, where house price developments are driven by self-fulfilling developments, is also a possible scenario. In such a scenario, house prices increase more than inter-

est rates, incomes and preference would suggest. Soaring prices may convince market participants that a large shift in demand is underway. This may result in home buyers rushing to buy in perception of continuously increasing prices. This situation may persist for some time, but, in the end, prices will correct, and often at a fast pace. Such a scenario is illustrated in Chart 9.¹⁴

14 In this scenario, it is assumed that prices continue to increase at the most recent growth rate until the end of 2022, after which a fast and sharp correction will occur. In this case this preference shift is temporary, and prices correct back to the level expected before the pandemic, see Chart 9.

House price growth assumed to ease off

In the projections in the Outlook for the Danish Economy, June 2021, house prices are assumed to follow an explicit scenario albeit uncertainty is high.

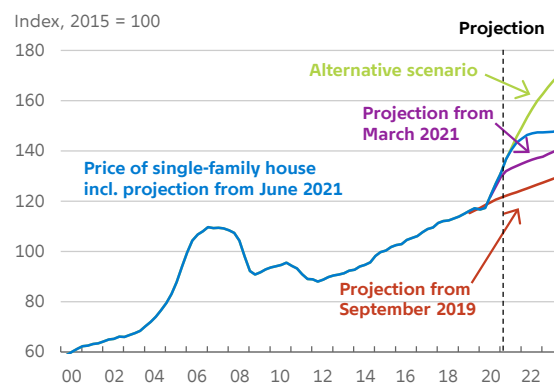
In the projected scenario, it is assumed that approximately half the price effects from the preference shift is permanent. This assumption is supported by American studies that indicate that 40 per cent of the total amount of working-from-home during the pandemic will continue after the pandemic, see Box 1. Other circumstances than working from home are also assumed to affect the preference for housing. This leads to the assumption that approximately 50 per cent of a preference shift is permanent. Likewise, it is assumed that prices will gradually balance demand pressure over the rest of the year.

On this background, house prices are assumed to increase by 14 per cent in 2021, see Chart 10. In 2022, the temporary effects will disappear and put downward pressure on price increases, and house prices are assumed to increase by 6 per cent in 2022 and 1 per cent in 2023. This should be seen together with other fundamental drivers of house prices such as interest rates, housing stock and incomes. Especially incomes are supported by the Danish economy moving towards a mild boom. Overall the assumptions imply that, at the end of the projection period in 2023, house prices will be almost 27 per cent higher than before the pandemic, and 14 per higher than expected without a pandemic, corresponding to the expectations in the projection from September 2019.

Time on market and price deductions are currently low, and there is a risk that this reflects further demand pressure from the preference shift than assumed in the projection scenario. As described above, a larger and more permanent preference shift will lead to markedly higher price increases in the coming years. This is illustrated in Chart 10 as an alternative scenario reflecting the assumption of the upper limit in Chart 9. With these assumptions, house prices will increase by 12 per cent in 2022 and 8 per cent in 2023. This implies that prices will be almost 30 per cent higher by the end of 2023 than expected without a pandemic.

Price growth will dampen as the economy reopens

Chart 10



Note: See Danmarks Nationalbank, Danish economy is heading for a mild boom, *Danmarks Nationalbank Analysis (Outlook for the Danish economy)*, No. 15, June 2021.

Source: Danmarks Nationalbank.

Current housing market pace may contribute to build-up of risks

There are currently no signs of imbalances on the housing market on aggregate. The cost of owning a home, the housing burden, is low in a historical context, as is the consumption ratio. The development in house prices has not, on average, been followed by increased borrowing by households, and home equity has increased on average. Substantial consolidation needs do thus not seem apparent at the macro level in the projection scenario.

On parts of the housing market, warning lights have already started to flash though. This is the case for Copenhagen and surroundings and other large cities. The housing burden for e.g. owner-occupied apartments in Copenhagen is relatively high and has been increasing in recent years. At the same time, lending in Copenhagen has been growing faster than incomes since 2015.¹⁵ This has implied that the aggregate housing debt relative to disposable

15 It should be taken into consideration that the nation-wide disposable income is not necessarily representative for home buyers in Copenhagen.

income is nearing the same levels as before the financial crisis.

The developments in aggregated borrowing may also mask great differences across households. Increased borrowing among buyers and already indebted households may be masked by other households that have reduced their debt during the pandemic, e.g. as a result of increased liquidity, negative deposit rates etc.

The fast pace on the housing market over the past 14 months is expected to continue a little while longer. However, the projection scenario is subject to greater uncertainty than usual. This should be seen in the light of developments not only being driven by fundamental factors such as incomes and interest rates.

Regardless of the assumptions made about price developments at the present time, there are large societal risks related to a scenario in which house prices increase markedly or even run riot. Such a scenario may have an accelerating nature, and may quickly give rise to a self-fulfilling housing bubble with resulting larger price falls.

The larger and longer house prices increase, the greater the risk that the price developments may contribute to building up imbalances in the Danish

economy. Continued price increases create a platform for increased borrowing among households to finance greater than expected consumption and housing investment boom. It has been seen before that it can take time for increased home equity to translate into debt, consumption and housing investment.¹⁶

The economy is more vulnerable when house prices are driven by credit

House price increases driven by increased borrowing adds to the probability of a negative spiral where even minor falls in house prices have a negative impact on the real economy. This may happen if consumption is held back following falling house prices. This reduces activity in the economy, which, in turn, reduces incomes and puts downwards pressure on house prices. This is the case even if the imbalance does not result in the incurrence of large losses by the financial sector. Such a spiral may, for example, occur when consumers are credit constrained and there is a possibility of drawing on home equity by borrowing when prices increase. Put differently, the housing market may amplify fluctuations in activity both in and outside a financial crisis.¹⁷

An imbalance on the housing market and the interaction between credit growth, house prices, consumption and housing investment, can explain why falling asset prices may dampen economic activity for a

¹⁶ See Grinderslev et al., Financial cycles: What are they and what do they look like in Denmark?, *Danmarks Nationalbank Working Paper*, No. 115, June 2017.

¹⁷ Consumption can follow higher house prices through at least two channels: A wealth channel and a collateral channel. Under the first channel, households feel richer, which induces them to increase their consumption. Under the collateral channel, house price increases allow credit constrained households to draw on their home equity to increase consumption. The two channels cannot fully be separated, but, under both channels, the housing market acts as a significant amplifier of fluctuations in economic activity. The literature points towards the collateral channel being the most important factor for the effect of house price changes on consumption in Denmark, see Henrik Yde Andersen and Søren Leth-Petersen, Housing wealth or collateral: How home value shocks drive home equity extraction and spending, *Journal of European Economic Association*, February 2021, or Simon Juul Hviid and Alessia De Stefani, Housing collateral and home-equity extraction, *Danmarks Nationalbank Working Paper*, No. 135, February 2019.

longer time than would otherwise be the case.¹⁸ At the same time, the imbalance may be asymmetrical: Booms driven by house price growth may be shorter and less pronounced than the following downturn.

It is an anomaly that borrowing on average has not increased substantially in tune with increasing house prices. There may be many reasons, but suppressed consumption possibilities and resulting increased liquidity among households may be an important factor during the pandemic. But this shows that there is a risk for a greater and faster increase in debt, consumption and housing investment based on increased home equity when the economy normalises.

For this reason, it is desirable to implement stabilising mechanisms on the housing market that, in particular, inhibit credit-driven house prices, consumption and housing investment increases. A more robust framework for the housing market can reduce fluctuations in the Danish economy. These points are illustrated by simulations in Danmarks Nationalbank's DSGE model, see Box 2.

A good time for structural improvements of the housing market

The recent developments on the housing market show that prices may increase quickly and even very substantially. Fluctuations on the housing market may spill over to the real economy and, in some cases, impact financial stability. This applies to both the current and future housing market.

The property value tax freeze, broadly accessible interest-only mortgages and large deductability of interest rates have stimulated house price increases rather than stabilized developments over many years. It is desirable to improve these structures, and

now is a good time, as interest rates are low and the economy is heading for a mild boom.

Both today and in the longer term, structural improvements will contribute to reducing the probability of large fluctuations in house prices and the associated societal costs – so-called tail risks. The implementation of the new tax reform in 2024 is an important part of this.

Restricted interest-only mortgages and lower deductability for interest rates decrease vulnerability

Actions that may increase the robustness of households – and thereby the housing market and the Danish economy as a whole – may, for example, be amortisation requirements for the most indebted homeowners.¹⁹ An implementation of an amortization requirement for borrowers that owe more than 60 per cent of the value of their home is expected to put slightly downward pressure on house prices in the coming years, other things being equal. Such an effect can be evaluated in Danmarks Nationalbank's macroeconomic model, MONA. Here, an amortization requirement implies that the minimum first-year housing burden increases for some home buyers. Seen in isolation, an amortization requirement for home buyers with a loan-to-value ratio of more than 60 per cent will decrease house prices by 6 per cent over 10 years. This should be compared with house prices already having increased by 15 per cent during the pandemic.

A reduction of interest rate deductability may reduce the incentive to take on debt and thus increase the robustness of households. In a low interest-rate environment, this improvement can be achieved without resulting in substantial short-term costs to homeowners. In the longer term, the reduction of interest rate deductability may contribute to lower borrowing. A gradual reduction of deductability over the coming years is expected to have a limited effect on house prices. As an example, a 10 percentage point reduction of deductability is expected to reduce house prices by 2 per cent over a 10-year period. It is

¹⁸ Previous analyses by Danmarks Nationalbank have shown that economic crises on the back of credit growth and large increases in house prices are longer than other types of crisis, other things being equal, see Kramp and Pedersen, Expansions do not necessarily end because of old age, *Danmarks Nationalbank Analysis*, No. 10, June 2020. This result is supported by international literature.

¹⁹ See e.g. The Systemic Risk Council Press Release of the 33rd Meeting ([link](#)).

appropriate with a long-term plan for the reduction of interest rate deductability such that home buyers can make plans on an informed basis.²⁰

House prices have increased markedly during the pandemic, and there is a substantial risk that this trend will continue. This increases the risk of building up imbalances in the Danish economic with a number of resulting societal costs. The recommended actions will reduce house price growth, but only to a very limited extent compared to the increases in the past year. Household borrowing has only increased a little on aggregate, and even a minor correction of house prices is thus not expected to give rise to consolidation needs that can effect the macro economy. At the same time, interest rates are low and the economy is heading towards a mild boom. For these reasons, it is currently a good time to implement actions that can underpin the robustness of the Danish economy and support financial stability.

20 Interest rate deductability should be seen in relation to the general capital taxation scheme. Pension return taxation is e.g. markedly lower than the interest rate deductability which incentivizes to save in pension rather than amortize on debt. For a more comprehensive run-through of Danish capital taxation, see Det Økonomiske Råd, Kapitel II, Kapitalindkomstbeskatning, Dansk økonomi, Spring 2019.

Developments in the housing market can spill-over to the broader economy: The effects of changed housing preferences in a macroeconomic model

Box 2

Soaring house prices can affect the economy more broadly if more equity among homeowners is translated into consumption and housing investment through increased debt levels. Such a development can amplify cyclical fluctuations in the economy.¹ These points can be illustrated using Danmarks Nationalbank's DSGE model.² In the DSGE model, price increases can be directly linked to an increased housing preference, which for given prices, interest rates, income and housing stock increases house prices. Two cases are considered for the preference shift. In the first case, it is assumed that the preference shift is temporary. The consequences for the housing market and the broader economy are illustrated in the left panel of figure A. In the second case, a temporary preference change is assumed, which first increases the house price, after which the preference shifts falls and pushes the house price below the initial level. This is illustrated in the right panel of figure A. The size of the preference shift in both cases corresponds to the unexplained part of the price development in 2020, see figure 3.

In the first case, the preference shift means that house prices initially rise as the preference shift materializes. Rising house prices are stimulating household consumption. This effect should be understood in relation to the two types of

households that appear in the model. One type of household is credit constrained and can only borrow with security in housing. The increase in house prices increases the equity, and thus gives the credit constrained households the opportunity to increase borrowing and increase consumption. The second type of household is not credit constrained. They will instead lower their other consumption to make room for increased housing consumption for the same income and wealth.

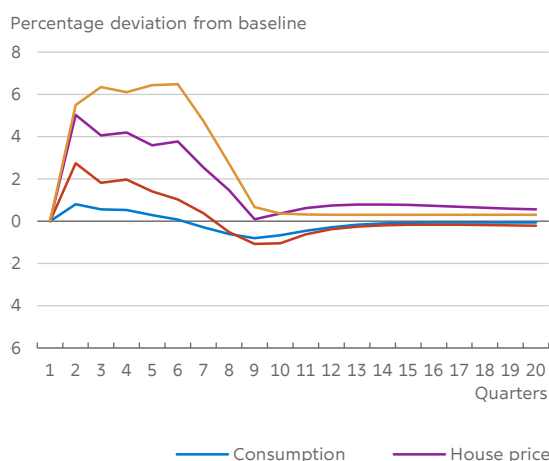
The initial rise in house prices is followed by a fall as the temporary preference shift disappears. Housing prices thus find their way back to the same level as in the absence of the preference change. The development means that household consumption and debt also fall, but to a level below the starting point. Housing price developments thus amplify fluctuations in the economy. Consumption and debt only return to their original level later in the process, and the economy thus undergoes a period of decline in consumption and debt, even though house prices are unchanged. The developments must be seen in the light of the equity for credit-constrained households that decreases, and their op-

Continues...

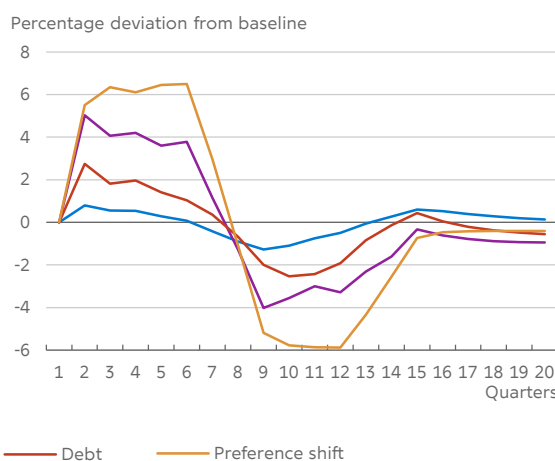
Effects on debt, consumption and house price of housing preference

Chart A

Effects of a temporary housing preference shift



Effects if housing preference shifts below initial level – a house price cycle



Note: The figure shows the development in house prices, consumption, debt as a consequence of shifted preferences for housing.
Source: Own calculations on Danmarks Nationalbank's DSGE model, see Pedersen (2016).

1. See also Grinderslev mfl., Financial cycles: What are they and what do they look like in Denmark?, *Danmarks Nationalbank Working Paper*, No. 115, June 2017.
2. Jesper Pedersen, An estimated DSGE-model for Denmark with housing, banking, and financial frictions, *Danmarks Nationalbank Working Paper*, nr. 108, October 2016.
3. See Javier Andrés, Oscar Arce and Carlos Thomas, Structural reforms in a debt overhang, *Journal of Monetary Economics*, 88, June 2017.

Developments in the housing market can spill-over to the broader economy: The effects of changed housing preferences in a macroeconomic model

Box 2

...continued

tion for debt and consumption decreases. The consolidation phase of these households has negative consequences for the rest of the economy because their lower consumption leads to declining economic activity. This in turn affects demand in the housing market. Only when the debt is back at the initial level, corresponding to the credit limit of the credit-constrained households, can their consumption be normalized.⁵

If the increased housing preference is counteracted by a corresponding reduction in the housing preference, then the spillover from the housing market to the economy will be greater, as illustrated in the second case shown in the figure A to the right. Here, the preference shift drives down the house price below its starting point. Fluctuations in house prices could also be considered in other contexts, such as during financial crises or burst house price bubbles. The case illustrates that the greater the fluctuations in house prices, the greater the spillover on the broader economy. The case also shows that the spillover on the rest of the economy is not symmetrical, even though the preference shift is. In other words, a sudden rise in house prices followed by a completely corresponding fall can drive up economic activity, but the subsequent fall in economic activity is greater and longer lasting than the initial rise.

The general structures in the housing market can have an impact on the rest of the economy. Analyzing this issue can be a challenge. Both the value of the interest deduction and the nominal freeze of housing taxation have affected households' balance sheets over a number of years, which can be difficult to capture in one model. The same can be expected to be the case for the availability of interest-only mortgages. In this part of the box, however, an attempt is made to illustrate how the structures in the Danish housing market can affect the spillover on the broader economy. However, a welfare analysis is not performed. It is disregarded, for example, that interest-only mortgages can ease inhibiting credit constraints for some households, just as the model used, for example, does not contain actual systemic risk and bankruptcies.

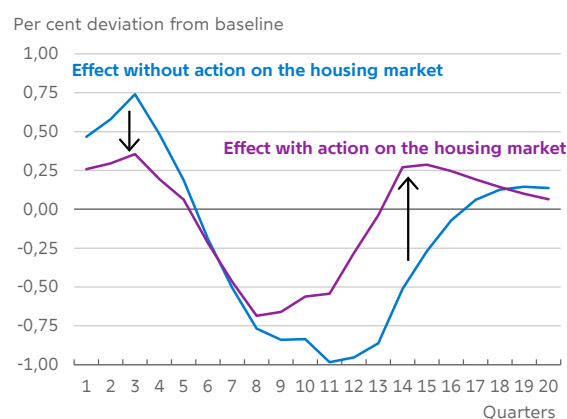
Based on the second case, shown in Figure A to the right, the mechanisms are illustrated. The preference shift is incorporated both under the current structures in the Danish housing market, but also under a set of alternative assumptions: (1) Lower interest deductability: The interest deduction is reduced by 10 percentage points. (2) Reintroduce the link between housing taxes and house prices. (3) Lower degree of amortization corresponding to 1 percentage point higher repayment on mortgages. (4) 5 percentage points higher down-payment requirements. All measures are assumed to be fully phased-in in the simulation. It is emphasized that these changed assumptions are not actual recommendations for economic policy, just as the size of

the changes is set arbitrarily. The alternative structures have only been introduced in the model to illustrate how changed structures in the housing market can change the spillover to the broader economy.

Figure B shows the impact on consumption under the two assumptions described above: With current structures, and with the mentioned alternative structures. Consumption increases less in a process with implemented measures, because housing prices rise less. Similarly, consumption also decreases less when the preference shift is reversed. Consumption thus also returns earlier to its starting point in a situation under the alternative structures. The simulations indicate that if all four imaginary measures were implemented, then consumption would increase by approximately 0.5 percentage points less, but also decrease by approximately 0.5 percentage points less. Consumption would return to its starting point about 3 quarters earlier, compared to a situation with the current structures in the housing market. The process reflects the same mechanisms as presented first in this box: That increased credit, either in the form of low down-payment requirements or a high extent of interest-only mortgages, increases the spiral between debt, consumption and the housing market. At the same time, the decoupling between the taxation of housing and the price of housing means that this spiral is becoming stronger. The simulations illustrate that measures can reduce fluctuations in house prices, and thus the overall economic activity. It makes the economy less vulnerable.

Effects on consumption from a house-price cycle

Chart B



Note: The figure illustrates the development in consumption as a consequence of housing preference shifts.

Source: Own calculations on Danmarks Nationalbank's DSGE model, see Pedersen (2016).

PUBLICATIONS



NEWS

News offers quick and accessible insight into an Analysis, an Economic Memo, a Working Paper or a Report from Danmarks Nationalbank. News is published continuously.



ANALYSIS

Analyses from Danmarks Nationalbank focus on economic and financial matters. Some Analyses are published at regular intervals, e.g. *Outlook for the Danish economy* and *Financial stability*. Other Analyses are published continuously.



REPORT

Reports comprise recurring reports and reviews of the functioning of Danmarks Nationalbank and include, for instance, the *Annual report* and the annual publication *Danish government borrowing and debt*.



ECONOMIC MEMO

An Economic Memo is a cross between an Analysis and a Working Paper and often shows the ongoing study of the authors. The publication series is primarily aimed at professionals. Economic Memos are published continuously.



WORKING PAPER

Working Papers present research projects by economists in Danmarks Nationalbank and their associates. The series is primarily targeted at professionals and people with an interest in academia. Working Papers are published continuously.

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.

DANMARKS NATIONALBANK
LANGELINIE ALLÉ 47
DK-2100 COPENHAGEN Ø
WWW.NATIONALBANKEN.DK

This edition closed for
contributions on 21 June 2021



**DANMARKS
NATIONALBANK**

Simon Thinggaard Hetland
Economist
sthe@nationalbanken.dk

Simon Juul Hviid
Principal Economist
sjh@nationalbanken.dk

Jesper Pedersen
Advisor
jpe@nationalbanken.dk

Adrian Michael Bay Schmith
Economist
ambs@nationalbanken.dk

ECONOMICS AND
MONETARY POLICY

CONTACT

Ole Mikkelsen
Communications
and Press Officer

omi@nationalbanken.dk
+45 3363 6027

SECRETARIAT
AND COMMUNICATIONS