LAPSE OF TIME

SM/20/99

June 29, 2020

To: Members of the Executive Board

From: The Secretary

Subject: **Denmark—Financial System Stability Assessment**

Board Action:	Executive Directors' **consideration** on a lapse of time basis
Deadline to Request Board Meeting:	**Monday, July 13, 2020** **12:00 (noon)**
Proposed Decision Deemed Approved:	Wednesday, July 15, 2020
Provisional Board Meeting Date: (if requested)	Wednesday, July 15, 2020
Additional Information:	The FSSA for Denmark is being issued for discussion on a stand-alone basis because the mission work was concluded prior to the outbreak of the pandemic, so the FSSA has been completed, as envisaged in Extension of Consultation Cycles Due to Covid-19 Pandemic (SM/20/89).
Publication:	Yes*
Questions:	Mr. Elekdag, MCM (ext. 34835)
Document Transmittal in the Absence of an Objection and in accordance with Board policy:	Tuesday, June 30, 2020—European Central Bank, European Commission After Board Consideration—Food and Agriculture Organization, Organisation for Economic Cooperation and Development, World Food Programme, World Trade Organization

***Unless an objection from the authorities is received prior to the conclusion of the Board's consideration, the document will be published.**

INTERNATIONAL MONETARY FUND

DENMARK

FINANCIAL SYSTEM STABILITY ASSESSMENT

June 29, 2020

KEY ISSUES

COVID-19 pandemic: Much of the Financial Sector Assessment Program (FSAP) work was conducted prior to the COVID-19 pandemic. Given the FSAP's focus on vulnerabilities and policy frameworks, many of the FSAP's findings and recommendations remain pertinent. This report includes illustrative scenarios to quantify the possible implications of the COVID-19 shock on bank solvency.

Findings: Solvency stress tests indicate that while the COVID-19 shock would have a significant and differentiated impact on capitalization ratios, all SIFIs would meet their minimum capital requirements. Given the unprecedented nature of the ongoing pandemic, these findings are associated with a substantial degree of uncertainty and subject to downside risks: A further deterioration of macrofinancial conditions could bring about a situation where some SIFIs breach their minimum capital requirements. Mortgage credit institutions play a central role in the domestic interbank system and can generate significant contagion effects.

Policies: Danmarks Nationalbank (DN) promptly provided liquidity support in response to the intensification of the crisis and has launched liquidity facilities and has reactivated swap lines. Looking ahead, DN should continue to enhance its operational preparedness for nonstandard liquidity support, including by refining the framework for accepting credit claims as nonstandard collateral. Notwithstanding a significant strengthening of the crisis management framework in recent years, the autonomy of the resolution authority should be strengthened, resolution planning for systemic institutions should be accelerated, and strategies for liquidity assistance to institutions in resolution should be defined. The operational independence of the Danish Financial Supervisory Authority (DFSA) should be safeguarded and it would benefit from a further increase in resources. The DFSA must complement its strong credit risk skills in banking with equal rigor in other areas (such as governance, compensation practices, and risk culture). Denmark should continue strengthening AML/CFT supervision, including by intensifying on-site inspections of higher-risk financial institutions. Going forward, to reduce inaction bias, the institutional arrangements for macroprudential policy can be improved by streamlining the decision-making process.

Approved By
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This report is based on the work of the Financial Sector Assessment Program (FSAP) mission that visited Denmark in October 30–November 14, 2019 and February 25–March 18, 2020.

- The FSAP team was led by Selim Elekdag (Mission Chief) and Mario Catalán (Deputy Mission Chief) and included Mark Buessing-Loercks, Ibrahim Ergen, Ziya Gorpe, Jan Philipp Nolte, Umang Rawat, and Katharine Seal (all MCM), Olamide Harrison (EUR), Deeksha Kale (MCD), Jay Purcell (LEG), Timo Broszeit and Jane O'Doherty (experts). At headquarters, Elizabeth Mahoney provided research support and Kateryna Botsu provided administrative and editorial assistance.

- The mission met with senior Danish officials, including the Governor of the DN, the Director General of the DFSA, the Chief Executive Office of the Financial Stability Company (FSC), members of the Systemic Risk Council (SRC), as well as senior management and staff at the Ministry for Industry, Business, and Financial Affairs (MIBFA), DN, DFSA, and FSC. The mission also met with senior counterparts at banks and insurance companies as well as academics, think tanks, and industry representatives.

- FSAPs assess the stability of the financial system as a whole and not that of individual institutions. They are intended to help countries identify key sources of systemic risk in the financial sector and implement policies to enhance its resilience to shocks and contagion. Certain categories of risk affecting financial institutions, such as operational or legal risk, or risk related to fraud, are not covered in FSAPs.

- Denmark is deemed by the Fund to have a systemically important financial sector according to Mandatory Financial Stability Assessments Under the Financial Sector Assessment Program—Update (11/18/2013), and the stability assessment under this FSAP is part of bilateral surveillance under Article IV of the Fund's Articles of Agreement.

- This report was prepared by Selim Elekdag and Mario Catalán with contributions from the FSAP team.

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Glossary

AML/CFT	Anti-Money Laundering and Combating the Financing of Terrorism
BCP	Basel Core Principles
BU	Bottom-Up (stress test)
CAR	Capital Adequacy Ratio
CCB	Capital Conservation Buffer
CCyB	Countercyclical Capital Buffer
CET1	Common Equity Tier 1 Capital Ratio
CRE	Commercial Real Estate
DFSA	Danish Financial Supervisory Authority (Finanstilsynet)
DGS	Deposit Guarantee Scheme
DN	Danmarks Nationalbank
DSTI	Debt Service to Income Ratio
DTI	Debt-to-Income Ratio
EBA	European Banking Authority
ECB	European Central Bank
ELA	Emergency Liquidity Assistance
FSC	Financial Stability Company
GFC	Global Financial Crisis
ICPF	Insurance Companies and Pension Funds
LCR	Liquidity Coverage Ratio
LTV	Loan-to-Value Ratio
MCI	Mortgage Credit Institution
MIBFA	Ministry for Industry, Business, and Financial Affairs
ML	Money Laundering
MLF	Money Laundering Forum
MOF	Ministry of Finance
MoU	Memorandum of Understanding
NPL	Nonperforming Loan
OECD	Organisation for Economic Co-operation and Development
RWA	Risk-Weighted Asset
SCR	Solvency Capital Requirement
SIFI	Systemically Important Financial Institution
SRB	Systemic Risk Buffer
SRC	Systemic Risk Council
TD	Top-Down (stress test)
WEO	IMF World Economic Outlook

EXECUTIVE SUMMARY

Much of the work of the FSAP was conducted prior to the COVID-19 pandemic. Given the FSAP's focus on medium-term challenges and vulnerabilities, however, many of its findings and recommendations for strengthening policy and institutional frameworks remain pertinent. This report reflects key developments and policy changes since the FSAP mission work was completed, and includes illustrative scenarios to quantify the possible implications of the COVID-19 shock on the solvency of systemically important financial institutions (SIFIs).

Prior to the COVID-19 pandemic, the Danish authorities had taken important steps to improve financial system resilience. The authorities had actively used macroprudential tools to bolster the robustness of the financial system. The supervision of the banking and insurance sectors had improved. Likewise, recent legislation enables enhanced anti-money laundering and combating the financing of terrorism (AML/CFT) supervision, including by strengthening monitoring and enforcement powers and stiffening certain non-compliance penalties. Major reforms such as a new bank resolution framework had also considerably improved Denmark's financial safety net and crisis management frameworks.

Stress tests indicate that the COVID-19 shock is expected to have a large impact on SIFIs' capitalization ratios, though all would continue to meet minimum capital requirements. Stress tests were conducted using illustrative scenarios that attempt to capture the adverse growth and unemployment implications of the COVID-19 shock on the solvency of SIFIs. Although the adverse macroeconomic conditions associated with the COVID-19 pandemic have a significant impact on capitalization ratios, all SIFIs would meet their minimum capital requirements. However, the impact is differentiated across SIFIs, and, in some cases, a few SIFIs would need to partially use their capital conservation and/or SIFI buffers. Importantly, given the unprecedented nature of the ongoing pandemic, these scenarios, and their implications for SIFIs, are subject to considerable uncertainty and downside risks: A further deterioration of economic prospects relative to those assumed under the scenarios, or tighter financial conditions, could bring about a situation where some SIFIs breach their minimum capital requirements. The financial stability risks stemming from the insurance sector appear contained for now; in the stress tests, life insurers would be significantly hit by market shocks but most remain well above the regulatory solvency thresholds, while occupational pension funds and non-life firms are more resilient. At present, bank liquidity appears adequate and tests suggest that banks can withstand more significant funding pressures than those observed in March 2020. MCIs play a central role in the domestic interbank system and can generate significant contagion effects across a financial system which is densely linked by covered bond exposures.

Danmarks Nationalbank (DN) promptly provided liquidity support in response to the intensification of the crisis. In particular, DN has launched extraordinary liquidity facilities and reactivated bilateral swap lines with the ECB and the Federal Reserve. Looking ahead, DN should continue to refine its operational preparedness for nonstandard liquidity support. Specifically, domestic interagency collaboration should be improved and the framework for accepting credit claims as nonstandard collateral should be further automated.

The financial safety net and crisis management framework has been considerably enhanced, yet operational readiness is an area where further improvements are warranted. Notwithstanding ongoing efforts, the resolution planning process for systemically important financial institutions (SIFIs) should be expedited. The authorities still need to define strategies for liquidity assistance to institutions in resolution. To strengthen the autonomy of the resolution authority, the government should be involved in resolution decisions only when fiscal support is needed. A national crisis management plan, including a crisis communication strategy, should be developed and tested.

Prudential supervision is generally sound, but there is scope for further improvement. The DFSA's risk-based supervisory approach focuses on traditional financial risks; in particular credit risk in banking and market risks and asset-liability management in insurance. However, its strong traditional focus needs to be complemented with equal rigor in other areas such as governance and risk culture as risks arising in these fields have the capacity to undermine banking soundness rapidly. Insurance supervision should be further strengthened by increasing on-site inspection frequency, completing a solid risk assessment framework, and enhancing the oversight of cross-border business. The DFSA's operational independence should be safeguarded and it would benefit from a further increase in resources.

Denmark should build upon its recent reforms so as to maintain its momentum in strengthening AML/CFT supervision in the banking sector. The DFSA should finalize its new institutional risk assessment model and incorporate the results into its on-site inspection schedule. Moreover, the DFSA should intensify (that is, significantly lengthen and deepen) its on-site inspections of higher-risk financial institutions as a matter of priority and demonstrate the effective use of its new monitoring and enforcement powers when appropriate. The Government should consider next-stage options for the integration/consolidation of AML/CFT supervision at the sub-regional or EU levels and pursue the selected option(s).

It is important to continue to strengthen the macroprudential policy framework going forward. In particular, the institutional arrangements can be improved by streamlining the decision-making process to reduce inaction bias and further enhancing accountability on macroprudential policy. If elevated vulnerabilities in the housing sector remain after the COVID-19 pandemic, additional macroprudential actions could be warranted over the medium term, in form of tighter loan-to-value limits and binding income-based measures on borrowers. Coordinated policies are also needed to reduce debt bias, simplify rental regulations, and relax supply constraints on housing. Data gaps in the CRE sector limit the assessment of vulnerabilities and should be closed, especially given the rising risks in this sector. Systemic risk monitoring should more actively cover the nonbank sector.

Danish banks are more exposed to physical risk from climate change, especially flood-related disasters, than to transition risk. Although 1½ percent of mortgage assets serving as collateral are currently at risk of flooding, this share could increase to 13 percent. Banks have limited exposure to the high carbon-emitting industries. Non-life insurers are mainly exposed to windstorms and cloudbursts, but these risks are largely transferred to reinsurers.

Table 1. Denmark: Key Recommendations	
Recommendations and Authority Responsible for Implementation	**Time[1/]**
Systemic Risk Oversight and Macroprudential Policy	
Give the chair of the SRC the ability, enshrined in law, to make proposals for a recommendation after due consultation with other SRC members without the need to strive for consensus (MIBFA).	MT
Introduce national legislation to include borrower-based tools (limits on LTVs, DTIs, and DSTIs) in the policy toolkit (MIBFA).	MT
Introduce a stricter LTV limits to safeguard against large house price shocks (MIBFA).	MT
Introduce a binding income-based macroprudential measure that limits lending to households above a certain DTI (MIBFA).	MT
Issue recommendations to responsible authorities to reduce debt bias, simplify rental regulations, and relax supply constraints on housing (SRC).	MT
Close data gaps, including by enhancing the coverage and quality of commercial real estate data (DN).	MT
Develop macroprudential stress tests that take feedback loops between financial system and real economy more fully into account while incorporating contagion effects across financial institutions (DN).	MT
Banking and Insurance Supervision	
Enhance the operational independence of the DFSA including by, for example, clearly stating in law the reasons for the dismissal of a DFSA Director General (MIBFA).	MT
Expand the budget envelop for the DFSA to recruit and retain quality staff across a full range of skills and experience and with a focus on non-financial risks (MIBFA).	ST
Develop more detailed guidance on risk assessments to support supervisory judgement and ensure consistent outcomes (DFSA).	ST
Enhance approaches to confirm explicitly the veracity of supervisory data and information received (DFSA).	MT
Increase the number of insurance on-site inspections guided by a finalized risk assessment framework and strengthen the supervision of cross-border business (DFSA).	ST
Anti-Money Laundering and Combating the Financing of Terrorism (AML/CFT)	
Test, finalize, and implement the DFSA's new institutional risk assessment model (DFSA).	ST
Intensify AML/CFT on-site inspections of higher-risk financial institutions (DFSA).	ST
Consider, select, and pursue next-stage options for the regional consolidation of AML/CFT supervision (MIBFA).	MT
Systemic Liquidity	
Complete the framework for accepting credit claims as non-standard collateral (DN).	ST
Seek greater domestic interagency information sharing and collaboration to enhance the operational preparedness for non-standard liquidity support (DN, DFSA).	ST
Financial Crisis Management and Safety Nets	
Strengthen the autonomy of FSC, including by limiting the decision power of the MIBFA in resolution to situations when fiscal support is needed (MIBFA)	ST
Expedite the resolvability of SIFIs, particularly by finalizing the priority areas for resolution planning (DFSA,FSC)	ST
Define strategies for liquidity assistance to institutions in resolution (DN,DFSA,FSC,MIBFA,MOF)	ST
Develop and test a system-wide contingency and crisis communication plan (DFSA,DN,FSC,MIBFA,MOF)	ST
[1/] ST: Short term (1-3 years); MT: Medium Term (3-5 years).	

BACKGROUND

A. Macrofinancial Context

1. Steady growth in recent years was abruptly interrupted by the COVID-19 pandemic.

- During the 2008-2009 global financial crisis, the economy underwent a sharp downturn which was exacerbated by the burst of the domestic real estate bubble. The combination of the sharp fall in house prices and the high level of household debt dampened private consumption growth, resulting in a recovery which trailed that of regional peers. During the past few years however, in an environment characterized by negative policy rates, the unemployment rate was at a 10-year low, and despite a positive output gap, structural reforms and the krone's tight peg to the euro has kept inflation low and stable (Figure 1, Figure2, Table 2).

- The outbreak of the pandemic has led to a sudden stop in economic activity and a sharp deterioration of short-term economic prospects reflecting in part the necessary containment measures. Likewise, after a long period of accommodation, financial conditions tightened sharply in March 2020, before easing again more recently (Figure 3). The timing and the shape of a future recovery remain highly uncertain, and risks are to the downside. In particular, there is a concern that a further tightening of financial conditions or a second pandemic wave could expose financial vulnerabilities.

2. The past track record of sound macroeconomic management enabled a prompt and decisive response to the crisis. Prudent fiscal policies and government debt at 30 percent of GDP have underpinned the sovereign's triple-A rating. Past current account surpluses have resulted in a sizeable stock of foreign assets. With such buffers, the authorities were able to rapidly implement a range of measures to contain the spread of COVID-19 and to support the economy (Box 1). Specifically, in addition to the countercyclical support that is expected to come through Denmark's strong automatic stabilizers, the authorities have provided discretionary fiscal support of approximately DKK 126 billion (5½ percent of 2019 GDP). Moreover, Danmarks Nationalbank (DN) has introduced an extraordinary lending facility and has reestablished swap lines; the countercyclical capital buffer (CCyB) was released.

3. The 2014 FSAP found that financial stability risks were broadly contained, but called for additional measures to further enhance systemic resilience. Existing vulnerabilities, such as the financial system's large size and interconnectedness, have been compounded by newer threats including signs of greater risk taking following a long period of persistently low interest rates, particularly in the commercial real estate (CRE) sector. Although policy arrangements have evolved, several weaknesses identified in the previous FSAP have yet to be fully addressed (Table 3). Notably, the Danske Bank money laundering (ML) case drew attention to what had been longstanding supervisory deficiencies (Box 2).

4. Much of the work of the 2020 FSAP was conducted prior to the COVID-19 outbreak. Nevertheless, this report has been updated to reflect key developments and policy changes since the work on the FSAP was completed, and includes illustrative scenarios to quantify the possible implications of the COVID-19 shock on the solvency of systemically important financial institutions (SIFI)s. Note that these illustrative scenarios focus on the growth and unemployment implications of the COVID-19 shock. These COVID-19 scenarios do not entail an abrupt tightening of financial conditions or a real estate downturn, though these shocks are part of a third scenario with more severe market shocks but less severe economic shocks. The possible amplification of the COVID-19 shocks for banking liquidity or potential system-wide contagion risks have also not been assessed.

B. Structure of the Financial System

5. Denmark's financial system is large, with assets over 630 percent of GDP (Table 4). The banking sector—comprising 77 banks and mortgage credit institutions (MCIs)—accounts for 55 percent of financial sector assets and is large in comparison with other countries. The banking sector is dominated by seven domestic SIFIs; the largest is the Danske Bank Group (with assets of about 170 percent of GDP). Insurance companies and pension funds (ICPFs) are also large relative to European peers (190 percent of GDP) partly due to the fact that life insurers are major providers of occupational pension plans. ATP is the dominant provider of pension savings outside the insurance sector.

6. The large size of the financial system reflects in part the high level of interconnectedness between financial institutions, households, and corporates (Figure 4). Household assets (housing and pension savings) and liabilities (mortgages) as shares of GDP are among the highest in the world. MCIs fund household mortgages by issuing covered bonds which are held by banks, ICPFs, and, increasingly, foreign institutional investors. ICPFs hold covered bonds as assets against their insurance and pension liabilities to households. The covered bond market is about 130 percent of GDP (almost five times the size of the government debt market) and the world's largest in relative and absolute terms (Figure 5).

7. Major SIFI's group structures include a commercial bank and an MCI (Table 5). Within groups, commercial banks are financed with deposits, provide loans to non-financial firms, and serve as the point of contract for customers of the group. MCIs serve as (capitalized) vehicles that issue covered bonds to finance the mortgage portfolios originated by the commercial bank (Box 3). These differentiated business models within the groups are reflected in the composition of assets and liabilities across banks and MCIs (Figure 6).

8. The banking system has strong linkages with other Nordic countries (Figure 7). The operations and exposures of major Nordic banks are concentrated in the Nordic-Baltic region through complex cross-border business arrangements. In particular, banking groups conduct mortgage lending operations in foreign countries via MCIs, which are structured as subsidiaries to facilitate compliance with differing local covered bond regulations; in contrast, other foreign banking operations are conducted using branches. In Denmark, the Finland-headquartered Nordea operates a large branch while other Nordic banks have only a small domestic presence. Danske Bank

has significant operations across the Nordic region via its MCI subsidiaries and commercial banking branches. The exposure of Denmark's banking groups to the Baltic region is now negligible, following Danske's retrenchment from the region in the aftermath of the ML case.

9. Banking groups exhibited high capitalization and liquidity ratios before the COVID-19 shock (Table 6). The aggregate risk-weighted capital ratio stood at 22.5 percent at end-2019 and all SIFIs met the minimum leverage ratio requirement of three percent. Moreover, during the six months prior to the crisis, SIFI's aggregate common equity tier 1 (CET1) ratio increased by over a full percentage point to 18.3 percent in 2020 Q1. Most SIFIs have also recently announced plans to cancel dividend payments and cancel their share buyback programs which would help bolster their capital buffers. Due to relatively low risk-weighted (mortgage) asset (RWA) densities, however, the introduction of risk weighted assets floors (under the finalized Basel III) may have significant implications for the four Danish banks using IRB models by lowering their regulatory capitalization ratios (Figure 8). All banks exceeded the minimum required Liquidity Coverage Ratio (LCR) of 100 percent by a comfortable margin—as of April 2020, the median LCR across systemic banks was 198 percent. Although the nonperforming loan (NPL) ratio has trended downward to a value of 1.7 percent at end-2019, there is a risk that asset quality would deteriorate owing to the aftereffects of the COVID-19 outbreak.

10. Bank profitability was adversely affected following the intensification of the COVID-19 pandemic. Despite the downtrend in net interest margins following a long period of low interest rates prior to the outbreak, the aggregate return on equity (ROE) of banks had been about 11½ percent on average over the last four years supported by low impairment charges not seen in over a decade and a wave of mortgage refinancing-related fee income (Figure 9). However, more recently, bank's ROE in 2020 Q1 fell to -2.7 percent, one of the lowest levels in recent years, owing to a sharp rise in loan impairment charges. Lending by banks and MCIs to the household and the nonfinancial corporate sectors has declined.

11. To mitigate the erosion of net interest income, banks are offering negative rates to depositors. The share of corporate deposits earning negative interest rates in systemic banks has risen from about 40 to 60 percent over 2017-19. Also, many SIFIs have begun passing on the negative policy rates to households with deposits over DKK 750,000 (€100,000) which is equivalent to the current level of deposit insurance. However, this strategy has its own limitations and risks: it cannot fully offset the decline in net interest income if interest rates remain persistently low and it could destabilize the funding base.

12. The prolonged period of low interest rates has been challenging for life insurance companies, and the first quarter of 2020 brought substantial investment losses. Even before the COVID-19 shock, the profitability in the life insurance sector was modest and was being dragged down by a relatively large (though declining) legacy portfolio of contracts with guaranteed rates of return of more than three percent which are notably above market interest rates (Figure 10). Low interest rates, longer life expectations, and the resulting change in product offering continue to be a key challenge for life companies, while market risks are increasingly borne by policyholders via unit-linked contracts. Covered bond exposures, which account for 60 percent of all fixed-income assets,

are almost entirely domestic. Non-life insurance has been characterized by favorable underwriting results and relatively low expense ratios. Solvency ratios have been broadly stable, hovering around 280 percent in both the life and non-life segments, well above the regulatory threshold of 100 percent.

13. As the role of investment funds grows, related vulnerabilities merit deeper analysis. Investments funds, which have been expanding appreciably owing to net inflows and rising valuations, account for about 91 percent of GDP and have sizeable linkages with ICPFs, banks, and nonfinancial firms. A more granular breakdown of the investment funds and their linkages with other sectors is becoming increasingly important for a comprehensive monitoring and appraisal of risks.

SYSTEMIC RISK ANALYSIS

A. Macrofinancial Vulnerabilities

14. On the eve of the COVID-19 pandemic, key financial vulnerabilities were associated with the housing market and mortgage financing:

- ***Household debt:*** Notwithstanding a gradual downtrend, Denmark's high level of household (gross) debt remains an important vulnerability (Figure 11). Household net wealth is relatively high, but a large share of households' assets is illiquid (housing and pension savings), limiting buffers to deal with shocks. This large stock of debt renders household consumption more susceptible to a confluence of adverse interest rate, asset price, and income shocks, which could reinforce macrofinancial feedback loops in a highly interconnected economy. Estimates suggest that although greater household leverage could stimulate near-term growth, it would also raise the chances of a slowdown over the medium term (Figure 12).

- ***Real estate prices:*** Nationwide house prices had stabilized in response to prudential measures and appeared to be broadly in line with fundamentals. By contrast, house prices in urban areas remained elevated through 2019. In fact, the downside risks to house prices associated with larger house price misalignments appear to be greater in Copenhagen relative to the national market (Figure 13).

- ***Mortgage loans:*** Despite improvements, the still high share of variable-rate mortgages (60 percent of the stock, of which 36 percent are non-amortizing) leave households sensitive to interest rate hikes (Figure 14).[1]

[1] Note that more than 50 percent of variable-rate mortgages have fixed-interest-rate periods that are greater than one year.

15. Indications of greater risk taking by financial intermediaries and nonfinancial firms, the changing risk profile of the commercial real estate and covered bond markets, and the incomplete implementation of risk-based AML/CFT supervision represent additional financial stability concerns:

- ***Risk taking:*** There was evidence of greater risk taking across segments of the banking and insurance sectors. Given persistently low interest rates and the attendant pressure on profitability, some medium-sized banks were aggressively extending credit to households with high loan-to-income ratios as they tried to further increase their market share in major urban areas (Copenhagen, Aarhus). Likewise, insurers had been searching for yield by increasingly investing in riskier assets, thereby increasingly exposing themselves to liquidity risks. The greater shift towards unit-linked products is supporting insurance companies' profitability, but transfers more risk to policyholders. This shift may reduce risk management incentives by insurers and would raise consumer protection concerns.

- ***Nonfinancial corporate (NFC) sector and CRE:*** Despite an overall decline before the COVID-19 shock, there was evidence of rising leverage in cyclically-oriented firms which were already indebted against a backdrop of loosening credit standards for the NFC sector (Figure 15). In particular, the CRE market was characterized by rising prices, a large share of foreign investors, and there were concerns regarding the income generating capacity of CRE (Figure 16). At the same time, CRE was among the most leveraged corporate sectors and where debt had grown the fastest in recent years. Firm-level analysis, conducted before the onset of the pandemic, indicated that the CRE sector, accounting for about 30 percent of the total corporate debt, was especially vulnerable. In particular, the analysis revealed a six-fold jump in debt-at-risk for the CRE sector in an adverse scenario—far greater than other sectors (Figure 17). Such fragilities, which are now more acute in light of the COVID-19 shock, are concerning because banks have sizeable exposures to the CRE market which in turn has significant interconnections with the rest of the financial system.[2]

- ***Covered bond market:*** Given the strong reliance on market-based funding, the increasing share of foreign investors confers diversification benefits, but at the same time increases the sensitivity of a regionally interconnected financial system to global investor sentiment. Although the Danish covered bond framework mitigates funding risks (Box 3), there are substantial holdings of covered bonds across domestic financial institutions.

- ***AML/CFT:*** Despite continuing, critical reforms to Denmark's AML/CFT regime, the recent money laundering case has affected both the reputation of, and confidence in, the financial system, such that financial stability could be impacted should foreign authorities issue significantly

[2] The pandemic has likely aggravated these financial vulnerabilities to varying degrees. For example, highly indebted and/or lower-income households are relatively more susceptible to shocks—a concern that could become more acute amid a protracted unemployment spell. Likewise, several nonfinancial corporate sectors, some of which were highly leveraged before the onset of the crisis, are being severely affected by the pandemic. At the same time, the credit quality of medium-sized banks' corporate customers is considerably lower relative to SIFIs. Notwithstanding the government support, a possible sharp rise in insolvencies would further add to banking strains.

larger-than-expected fines or other, similar cases come to light. Indeed, bond spreads and equity prices were adversely affected by the news of the Danske Bank case, elevating Danske's own funding costs and to a lesser extent those of other financial institutions for much of 2019.

B. Risks

16. These vulnerabilities and the macroeconomic situation define the main risks faced by the Danish financial system. These risks, which could be mutually reinforcing given the high degree of sectoral and cross-border interconnectedness and financial vulnerabilities, are presented in the Risk Assessment Matrix (RAM, Table 7) and summarized as follows:

- ***Prolonged Covid-19 outbreak***. Containment measures could remain in place (or in some places intensify or need to be re-introduced) through early 2021.

    - Longer containment and uncertainties about the intensity and the duration of the outbreak could reduce supply and domestic and external demand. A more protracted economic contraction in global growth would have a sustained negative impact on Danish exports, investment, and consumption. These risks could be exacerbated by pandemic-prompted protectionist actions as Denmark is a small open economy with many sectors—including shipping—deeply integrated in global value chains. Corporate-sector losses would be accompanied by further increases in unemployment, NPLs, and loan loss impairments weighing on bank profitability, possibly aggravated by tighter credit conditions, and adverse Nordic spillovers.

    - Deteriorating economic fundamentals and the associated decline in risk appetite could result in a second wave of financial tightening (amplified as latent fragilities are unmasked). A protracted and correlated decline in asset prices would adversely affect the internationally exposed portfolios of ICPFs, erode household wealth, and weigh on consumption growth. Second-round effects are likely to be significant given the high degree of Nordic financial integration and ensuing adverse macrofinancial feedback loops given the extent of domestic interlinkages and elevated household indebtedness.

- ***Sharp house price correction:*** The trigger could be associated with the global shocks discussed above or could be more regional or domestic in nature. Given close financial linkages, a Nordic real estate correction could quickly spark regional spillovers. Domestically, the shock could be triggered by a reassessment of fundamentals that sets a vicious cycle in motion, whereby tighter financial conditions and depressed economic activity amplify the impact of the initial shock.

C. Systemic Risk Assessment and Stress Testing

17. The impact of these risks on the financial system was assessed through stress tests of banks, MCIs, and insurance companies (Appendix I and II). The analysis covered all seven SIFIs (representing 77 percent of assets of credit institutions). The tests of banks and MCIs were performed at the (consolidated) group-level as well as on individual banks and MCIs, some of which

operate within the groups. Insurance stress tests covers five life insurers, six occupational pension funds, and five non-life insurers, accounting for more than 70 percent in each sector. ATP was also included.

18. The resilience of banks and MCIs was assessed under illustrative five-year scenarios. Importantly, these illustrative scenarios are not meant to be forecasts, and are associated with considerable uncertainty and downside risks (Figure 18):

- The first scenario, "COVID central," attempts to capture the abrupt deterioration of short-term economic prospects owing to the COVID-19 pandemic.[3] It envisages a sharp fall in GDP of 8 percent in 2020 (reflecting in part the containment measures), followed by a rebound of 6 percent in 2021. At the same time, the unemployment rate rises to 6.8 percent in 2020, before gradually declining. Note that this scenario focuses on the growth and unemployment implications of the COVID-19 shock, and does not entail an abrupt tightening of financial conditions (including a sharp rise in risk premia) or a real estate downturn (see Figure 18 for the scenario assumptions).

- To reflect the considerable downside risks associated with longer containment measures, a second scenario with a more prolonged recession is considered ("COVID prolonged"). In this scenario, growth declines by 8 percent in 2020, but, instead of a rebound in 2021, the economy continues to contract (by 2.1 percent in 2021) before the recovery ensues in 2022. The protracted economic contraction is accompanied by a large increase in the unemployment rate which rises to 11.8 percent in 2022 before steadily falling. This scenario also assumes that there is no sharp tightening in financial conditions or a decline in house prices.

- A third scenario, with more severe market shocks but less severe economic shocks, is also considered ("market shocks"). In particular, there is a sharp rise in asset risk premia (which adversely affects banks' funding costs) combined with a prolonged downturn in the domestic real estate market. These large market risk shocks occur amid a protracted recession (which is less severe in the short-term relative to the other two scenarios).[4]

Solvency Stress Tests

19. The solvency tests focused on SIFIs consolidated at the group-level. In particular, seven SIFIs (three financial groups, two banks, and two MCIs) are considered. For the three financial groups, the tests were performed on individual banks and MCIs and then consolidated by taking into account of intra-group holdings. Regarding banks, the economic downturns in the scenarios are expected to increase loan loss rates, but with significant variations across economic sectors and

[3] Note that these illustrative COVID scenarios differ from the April 2020 WEO baseline projections (Table 2).

[4] Although the three scenarios differ, including with respect to their assumptions on financial conditions and house prices, the same methodology is used across the scenarios to quantify their implications on bank solvency. Note that the "market shocks" scenario, designed before the onset of the COVID-19 pandemic, incorporates a combination of credit, market, and cost of funding shocks. The solvency stress tests use 2020 Q1 capital ratios, which are the latest available data.

therefore banks. In addition, cost of funding shocks, which can only be partially passed on to bank borrowers, would aggravate the erosion of net interest income. Regarding MCIs, the stress tests assessed their capacity to withstand the effects of adverse shocks that generate losses through three main channels: (i) credit losses triggered by mortgage defaults, (ii) losses from the downward repricing of securities held in capital centers, and (iii) the loss of net interest income from the issuance of higher-cost junior bonds needed to shore up the collateral of their capital centers. Importantly, note that the tests assume that within-group guarantees and those provided by banks outside of the stress testing perimeter are available to cushion the impact of loan defaults on MCIs' capitalization ratios.

20. The illustrative scenarios reveal a large impact on capital which varies across SIFIs:

- Under the COVID central scenario, the aggregate CET1 ratio declines from 18.3 percent in 2019 to a low point of 13.4 percent in 2020, while the aggregate leverage ratio declines to 3.6 percent (Figure 19). The materialization of credit risk, which is predominantly influenced by GDP growth and the unemployment rate, is the main driver of the losses. All SIFIs meet their minimum capital requirements (a 4.5 percent CET1 ratio) under this scenario, however, the impact on capital varies. Specifically, one out of the seven SIFIs must partially tap into its capital conservation buffer (CCB) to fully absorb the losses under stress. The leverage ratio (which is currently planned for implementation in mid-2021) for one SIFI falls below the three percent threshold.

- In the context of the COVID prolonged scenario, the aggregate CET1 ratio falls to a low point of 12.4 percent in 2022, reflecting the more protracted nature of the economic contraction. The aggregate leverage ratio would decline to 3.0 in 2024. Under this scenario, while all SIFIs still meet their minimum capital requirements, the impact on capital is more differentiated and subject to even greater uncertainty. While one SIFI makes partial use of its CCB, another SIFI needs to partially use its SIFI buffer. Likewise, the leverage ratios of a few SIFIs fall below three percent.

- Under the market shocks scenario, the capitalization ratios reach their respective troughs at the end of the stress testing horizon: the aggregate CET1 ratio decreases to 13.4 percent in 2024; the aggregate leverage decreases to 3.4 percent. Although this scenario assumes significantly more severe market shocks and a lasting domestic real estate downturn, the results are primarily driven by the protracted nature of the envisaged downturn. In this case, a few SIFIs make partial use of their CCBs and a few SIFIs' leverage ratios dip slightly below three percent.

21. These stress testing results should be interpreted with caution. In addition to the large uncertainty associated with these scenarios, several limitations need to be recognized. In the analysis, the relationship between growth and capitalization is non-linear, implying that deeper recessions have potentially disproportionate impacts on capital. Some second-round and non-linear effects, which are not fully captured in the analysis, could imply an underestimation of losses.[5]

[5] The analysis also presumes that pre-crisis relationships between macroeconomic and financial variables remain unchanged. The possible amplification of the COVID shocks for banking liquidity or potential system-wide contagion

(continued)

Importantly, the analysis suggests that a further deterioration of economic prospects and tighter financial conditions, relative to those assumed under the scenarios, could bring about a situation where SIFIs breach their minimum capital requirements.

Liquidity Stress Tests

22. The analysis suggests that the banking system could withstand significant withdrawals of short-term funding.[6] The cash-flow based tests assessed the resilience of individual banks to severe shocks to their cash inflows and outflows combined with asset liquidations subject to valuation haircuts. The assumed shocks in the liquidity stress tests were significantly larger than those that have materialized in 2020 Q1. Banks can counterbalance negative funding gaps by using their cash and by liquidating securities both in the markets and at the central bank (via standard monetary operations). The tests reveal that all five banks would be able to survive extreme liquidity pressures without external support for longer than three months.[7] Tighter financial conditions relative to those assumed in the tests could affect bank's access to liquidity and funding costs unevenly and may result in acute liquidity strains for some banks.

Insurance Stress Tests

23. The resilience of insurance companies was assessed through a top-down (TD) and bottom-up (BU) solvency stress tests implemented before the onset of the COVID-19 pandemic. These tests build on the narrative and severity of the market shocks adverse scenario and are also subject to uncertainty and downside risks. Note that these tests encompassed several market shocks which resulted in a combined stress scenario that was considerably more severe than what was observed in 2020 Q1 (Appendix II). Importantly, in contrast to banks where credit risk is critical, market shocks are the main risk factor relevant for the insurance sector, especially for the life insurance segment.

24. Under the adverse scenario, although regulatory solvency requirements are met in aggregate, the life insurance sector is significantly impacted. The BU tests indicated that although the industry is able to withstand severe asset price shocks, most of the solvency impact would be attributed to the increase in domestic sovereign and covered bond yields. After stress, the median solvency capital requirement (SCR) ratio in the life sector dropped from 188 to 127 percent, while in the non-life sector the ratio declined from 233 to 207 percent (Figure 20). One life company drops below a solvency ratio of 100 percent, and the capital needed to restore a full coverage of solvency capital requirements amounts to around DKK 4 billion, equal to less than 3 percent of the sample's aggregate capital. The TD tests broadly confirmed these results. Resurgent financial market

risks have not been assessed, underscoring the uncertainty surrounding the solvency stress test results, including their implications for individual SIFIs.

[6] The liquidity stress tests were conducted before the onset of the COVID-19 pandemic.

[7] According to the May 2020 DN Financial Stability Report (FSR), systemic banks, in aggregate, could cover their liquidity needs under a severe liquidity stress scenario. The FSR notes that the overall liquidity situation for systemic banks has not been materially affected by the COVID-19 pandemic as of mid-March. Moreover, the median LCR across systemic banks increased to 198 percent in April 2020 from 174 percent at end-2019.

turbulence associated with even more severe shocks relative to those assumed under the adverse scenario could impair insurers' solvency positions and profitability to a greater extent.

25. Over the medium-term, insurers will face declining investment returns as their higher-coupon bond holdings expire. In aggregate, the Danish life insurance sector still records positive spreads of investment returns over guaranteed interest rates, and is also expected to regain profitability after the materialization of the adverse scenario, but significant differences exist across companies. While insurers which are more active in non-life and unit-linked life business are less affected by the current low-yield environment, companies with a high legacy stock of guarantees on their policies are likely to experience a drain on their profitability.

26. The insurance sector appeared capable to withstand the losses simulated under the adverse scenario without materially amplifying market risks. In response to the stress conditions, life insurers would consider gradually divesting riskier holdings (equities, non-investment grade bonds) and increase their investments in sovereign and covered bonds. Likewise, non-life companies would also rebalance their portfolios and may even expand their investments in equities and real estate. In sum, the surveys from the BU test suggested that insurers reactions under the adverse scenario may mitigate the impact of the shocks on financial markets as they try to shore up their capital buffers.

27. Sensitivity tests point to longevity risks and the resilience of non-life companies to climate-related catastrophic events:[8]

- A strong increase in life expectancy would reduce the median SCR of life insurers and occupational pension funds to 210 percent. Higher mortality rates however, including temporarily stemming from a severe epidemic, would decrease annuity payments, while coverage for sickness pay and hospitalization are only moderate.

- In terms of climate-related risks, non-life insurers are mainly exposed to windstorms and cloudbursts, of which the latter occur more frequently, but remain local events with moderate losses per event. A repetition of windstorm Anatol, which hit Denmark in 1999 would result in a reduction of non-life insurers' own funds of only one percent as risks are largely ceded to reinsurers (see also Box 4).

28. ATP displays a considerable degree of resilience in the stress test.[9] Its individual reserve requirement remains covered by a significant margin. The stress reduces ATP's profits, which would turn negative in the first year of the projection horizon, and remain flat in the following two years assuming that asset prices would not recover. At the same time, wider spreads and a sharper decline in asset prices relative to those assumed under the market shocks adverse scenario could reduce ATP's bonus potential (free reserves) to a larger degree.

[8] These sensitivity tests were also conducted prior to the COVID-19 pandemic.

[9] The stress test of ATP was implemented before the COVID-19 outbreak.

Interconnectedness and Contagion Analysis

29. MCIs play a central role in the domestic interbank system. The interconnectedness analysis, which is more structural in nature, was conducted with a novel multi-layer contagion model that can distinguish the transmission of shocks across eight different exposure types based on the newly released credit registry database. Focusing initially on the domestic banking system illustrates that MCIs take center stage in the network linking systemic and non-systemic banks through a dense network of covered bond exposures (Figure 21). The full network highlights the strong connections between the Danish banking system and the domestic corporate (in particular, CRE) and household sectors (via loans) and domestic institutional investors, which include ICPFs and investment funds, (via securities). Cross-border exposures are especially strong with the Nordic region and the euro area financial system.

30. The analysis revealed that Danish credit institutions are mostly exposed to shocks from within the banking system:

- MCIs are a key source of outward spillovers and induce the highest levels of contagion losses through unlisted shares (reflecting complex group structures) and covered bond exposures (Figure 22). Contagion is transmitted predominantly through credit losses.
- Systemic banks, on average, are more vulnerable to inward spillovers owing to their covered bond holdings. More generally, the domestic banking system is susceptible to cross-border financial spillovers from the Nordic region and the euro area (including via interbank loans and deposits). Taken together, given their high contagion and vulnerability scores, the analysis identifies four financial institutions with the ability to amplify spillovers across the financial system.
- Overall, while losses from unlisted shares occur mostly within group structures, potential contagion from covered bond exposures can be more widespread.

FINANCIAL SECTOR OVERSIGHT

A. Macroprudential Policy

31. Denmark's atypical institutional set up for macroprudential policy remains unchanged since the last FSAP. The macroprudential authority is the Systemic Risk Council (SRC) which is chaired by the chairman of the Board of Governors of the DN. The SRC only has an advisory role and can issue observations, warning, and recommendations with an explicit "comply-or-explain" mechanism. The ultimate decision-making power however lies with the minister of industry, business and financial affairs, which is rare in international comparison. In practice, the minister will need the

support of the economic committee to make a decision and hence implicitly the hard powers for macroprudential authority lies with the government.[10]

32. DN plays an important role in systemic risk monitoring with the SRC providing an enabling environment for coordination on risk assessment and policy formulation. The SRC secretariat, housed in the DN, is responsible for preparing the materials for the SRC's quarterly discussions.[11] While the secretariat has worked on several thematic issues these are seldom published, notably due to resource constraints. The SRC would benefit from more frequent publications on selected issues to enhance communication and create awareness about macroprudential policies and the role of SRC in Denmark. This may require increasing resources devoted to systemic risk monitoring within the DN.

33. The Danish authorities have undertaken several measures to address household vulnerabilities since the 2014 FSAP. These include a mandatory down-payment requirement and other demand side measures (targeting loan origination and amortization) to bolster the resilience of borrowers in the mortgage market including by limiting lending via interest-only and floating rate mortgages to highly indebted households. The active implementation of such policies, in combination with other measures (such as property tax reforms and easing supply constraints), seem to have helped arrest the rapid increase in property prices.

34. After increasing the countercyclical capital buffer (CCyB) to two percent (effective December 2020), the authorities fully released it following the onset of the COVID-19 pandemic. It is important that the credit institutions use the provided flexibility to extend their lending capacity and not to pay additional dividends or conduct share buybacks.

35. Notwithstanding these policy initiatives, some elements of the framework render the system vulnerable to inaction bias. In particular:

- The legal framework for the SRC prescribes that it should strive for consensus in decision-making. Procedurally, the SRC secretariat is responsible for drafting macroprudential policy proposals that are then discussed in the SRC. However, the secretariat starts working on draft recommendations only after receiving a mandate from the SRC, which often follows a phase of consensus building within SRC meetings.[12] While there are merits to consensus building, in its extreme form implies that each member has an implicit veto power. The institutional arrangement should foster consensus building without letting it hold up decision-making. Delayed activation of CCyB and household sector tools despite signs of building vulnerabilities are two examples where consensus building may have limited action.

[10] Economic committee is the formal body where all economic ministries participate.

[11] Representatives from the DFSA and economic ministries participate in the secretariat.

[12] Since not all members of the SRC have an explicit mandate financial stability, their other, sometimes conflicting, priorities could delay the process and further entrench the inherent inaction bias associated with macroprudential policy whereby the cost of policy actions is sooner and more easily observable than their potential benefits.

- Another reason for inaction bias is the limited powers of the SRC. The SRC does not have hard powers over macroprudential tools. In fact, the MIBFA did not comply with SRC's recommendation regarding risks related to deferred amortization loans in 2014 and only partially complied with the recommendation targeting similar risks in 2017. This limited ability to act has resulted in inaction bias wherein (i) macroprudential action is either not taken or delayed, and (ii) when action is taken, second-best policy options are chosen in some cases, which internalize political feasibility.

36. Over time, a further tightening of borrower-based measures may be warranted to help address residual risks related to household vulnerabilities (Figure 15). Micro data suggests that households' NPLs respond non-linearly with LTVs. Relatedly, the mandatory down-payment requirement of five percent (an effective LTV limit of 95 percent) in Denmark is loose when compared to other countries. Further, the macroprudential toolkit to address household sector risk is incomplete because there is no legal basis to introduce binding borrower-based macroprudential measures. Therefore, several demand side measures have been introduced as guidelines under the consumer protection legislation rather than binding macroprudential measures, which may affect both the transparency and the impact of these measure. While the rules implemented in 2018 to limit lending via interest-only and floating-rate mortgages to highly indebted households is a move in the right direction, pockets of vulnerability remain. Further tightening measures should however be data dependent and take into consideration the uncertainty associated with the recovery from the COVID-19 shock.

37. Structural factors creating distortions in the housing market should be addressed. These include: (i) favorable tax treatment of owner occupied housing compared to other saving vehicles; (ii) high mortgage interest deductibility (causing debt bias) alongside tax exemption on capital gains in owner occupied housing; and (iii) complex rental market regulations with rent caps across a significant share of apartment buildings in the major cities, which creates a lack of housing supply. The ministries participation in the SRC should assist in the complementary use of fiscal measures for both fiscal and macroprudential policy.

38. The SRC should closely monitor risks in CRE market and stand ready to act if vulnerabilities intensify. The coverage and quality of data in the CRE sector should be enhanced, including by a centralized collection of market data and more granular information on CRE financing to assess vulnerabilities in the CRE market. Further, if risks in the CRE sector continue to rise in coming years, the authorities should consider taking macroprudential measures, for example, increasing risk weights on CRE exposures or introducing a sectoral systemic risk buffer.

39. SRC's systemic risk monitoring framework is largely focused on banks and MCIs and can be further enhanced. The SRC member institutions, in particular DN and DFSA, have strong analytical frameworks for systemic risk monitoring. The recent availability of credit registry database and interconnectedness analysis project which has been initiated (jointly with the FSAP team) would help in filling knowledge gaps. However, the monitoring framework can be further enhanced by: (i) more actively covering the nonbank sectors; (ii) developing truly macroprudential stress tests that

take into account of macro-financial feedback loops; and (iii) building on the interconnectedness work, particularly given centrality of covered bonds in the system.

40. The macroprudential policy formulation in Denmark would benefit from a more streamlined decision-making process and an expansion of the policy toolkit. In particular:

- Give the SRC chair the ability, enshrined in law, to make proposals for a recommendation—after due consultation with other SRC members—without the need to strive for consensus. This would limit the consensus building phase before the secretariat starts working on draft proposals. Over time, if inaction bias persists, the SRC could be given hard powers over capital tools under CRD/CRR legislation, that is, it is made the designated authority for macroprudential policy. Borrower-based tools, which have clear distributional implications, can remain with the MIBFA with the SRC having recommendation powers over them with a comply-or-explain mechanism.
- Introduce national legislation to include borrower-based tools (limits on LTV, DTI, and DSTI) in the policy toolkit. This is essential to enhance legitimacy of macroprudential policy.
- Over the medium term, introduce a stricter LTV limit (at least 90 percent) to safeguard against large house price shocks.
- If the uptrend in house prices continues, consider introducing binding income-based limits, such as DTI restrictions for all loans, irrespective of their LTV ratios.

B. Banking and Insurance Regulation and Supervision

Prudential Setting

41. The Danish Financial Supervisory Authority (DFSA) has improved standards in its oversight of banking and insurance since the last FSAP. The DFSA's supervisory approach focuses on traditional financial risks; in particular credit risk in banking and market risks and asset-liability management in insurance. The DFSA benefits from and uses a suite of corrective and enforcement powers, which were further augmented through AML/CFT legislation (that entered into force in January 2020).

42. The DFSA's operational independence is compromised, both through governance arrangements and through resource constraints. Risks to the industry, including with respect to money laundering, are better understood than they had been previously, though the supervisory skills and resources to mitigate those risks are still being built up as newly hired AML/CFT and insurance inspectors are still being trained. The funding structure, which levies fees on the industry but where the budget is set by the MIBFA (which has a non-voting representative on the Board), does not isolate the DFSA from the potential influence of government or industry. The MIBFA representative should be removed from the DFSA Board and the reasons for the dismissal of a Director General of the DFSA should be clearly stated in law and publicly disclosed.

43. The DFSA would benefit from a further increase in resources. There are concerns that the requirement that the DFSA operate on a "least cost" basis undermines the quality and needed further development of policy, processes, as well as the scope and execution of its tasks, notwithstanding its cadre of dedicated staff.

Banking Supervision

44. The DFSA has made a number of enhancements to its risk based supervisory approach since the last FSAP, acting on recommendations made. For example, the interval of the inspection cycle for sound and well-capitalized medium and smaller banks has been shortened from once every six to four years. A major project has recently been completed to document the DFSA's business processes and needs to be complemented by a similar project to support consistency of analytical approaches and risk interpretations. Also, enhanced approaches to confirm explicitly the veracity of supervisory data received, as part of standardized reporting schemes, are needed.

45. Nonfinancial risks warrant greater prominence in the DFSA's supervisory approach. The DFSA must complement its strong credit risk skills with equal rigor in other areas. Sharpening supervision of nonfinancial risks, including entities' compliance, governance, conduct, compensation practices, and risk culture is necessary.

Insurance Supervision

46. Implementation of the Solvency II Directive—which harmonizes EU insurance regulation—has enhanced insurance supervision and improved the risk culture across the sector. Adoption of the Directive addresses many of the 2014 FSAP recommendations and has raised the level of observance with the Insurance Core Principles.

47. Insurance supervision should be further strengthened by increasing on-site inspection frequency and completing a solid risk assessment framework. Following a 2014 FSAP recommendation, the number of on-site inspections in the life sector has slightly increased, while those in the non-life sector remain too infrequent. The nascent risk assessment for individual companies needs to include non-financial risks, in particular governance-related risks. Two smaller non-life insurers, heavily engaged in cross-border business, failed in 2018 because of issues related to an insufficient level of reserves and an incorrect assessment of assets. Therefore, although a new supervisory standard is being developed which addresses previous gaps in licensing and supervisory monitoring, the supervision of cross-border business should be strengthened.

Financial Integrity

48. Following the 2019 Article IV Consultation, the authorities have completed or initiated a number of reforms, including with respect to AML/CFT supervision. That Consultation included a targeted analysis to evaluate the ability of Denmark's AML/CFT supervisory framework to mitigate cross-border ML risks. Motivated in part by the Danske Bank case, recent legislation has significantly strengthened the AML/CFT monitoring and enforcement powers of the DFSA—most notably by allowing it to levy administrative fine notices and stiffening the existing penalties for

non-compliance with certain AML/CFT obligations. Since June 2019, the DFSA's AML Division has expanded considerably, thereby enabling it to conduct an increasing number of on-site inspections. In support of its on-site inspection program, the DFSA's AML Division has developed, but not yet finalized, a new institutional risk assessment model. The authorities comprising the MLF have adopted a new MOU to guide the coordination of domestic AML/CFT activities.

49. The process of reform must proceed apace to ensure the full implementation of the risk-based approach and make effective use of the DFSA's expanded powers. Ensuring the full implementation of the risk-based approach will require completing the testing and refining of the DFSA's new AML/CFT risk model, issuing the associated final questionnaires, and using the results to set the annual on-site inspection schedule. In addition, and as a matter of priority, the DFSA should intensify its on-site inspections of higher-risk financial institutions and demonstrate effective use of its new monitoring and enforcement powers, as and when appropriate, in response to violations of AML/CFT requirements.

50. Denmark should continue to strengthen AML/CFT international and domestic cooperation arrangements. Further strengthening international cooperation arrangements will require the Government to consider next-stage options for the integration/consolidation of AML/CFT supervision at the sub-regional or EU levels and pursue the selected option(s). Further strengthening domestic cooperation arrangements, including as between the public and private sectors, will require the MLF to review the recommendations released by Finance Denmark's AML Task Force that would imply action by the authorities, and advance agreed initiatives.

SYSTEMIC LIQUIDITY

51. Covered bond markets—which are key to bank funding—continued to facilitate mortgage financing despite the tightening of financial conditions, though there are important tail risks. Covered bond markets have demonstrated resilience during past episodes of financial turbulence. More recently, after a brief period of more subdued primary market activity in March 2020, Danish covered bond issuers were able to resume new issuances and facilitate the financing of mortgages. In the secondary market, covered bond spreads spiked during March and early April, but recovered quickly thereafter. The high degree of interconnectedness of the financial system—through covered bond holdings—means that ensuring the health of this market under stressed conditions is crucial for financial stability.

52. DN's standard operational framework is credible and effective. DN has been able to keep the exchange rate stable through adjustments to its policy rate and FX interventions. Money market rates have moved in tandem with the policy rates and the introduction of daily market operations in 2017 has improved further the functioning of the interbank market by reducing the volatility of short-term interest rates.

53. DN promptly provided liquidity support in response to the intensification of the crisis. In particular, DN has launched extraordinary liquidity facilities and reactivated bilateral swap lines

with the ECB and the Federal Reserve thereby ensuring counterparties' access to liquidity in the needed currencies. Although it is too early for a comprehensive assessment, the measures taken by the DN have been accompanied by a stabilization in money markets and an easing of liquidity and financial conditions. DN has continued to further strengthen its capacity to manage liquidity conditions in times of stress. Nonetheless, the current crisis underscores the importance of further refining its operational preparedness in the following areas:

- Complete the planned refinements to the framework for accepting non-standard collateral (which include credit claims). Increasing automatization for mobilization, eligibility assessment, and pricing of credit claims would significantly improve operational efficiency. In addition, such automatization would ultimately broaden the collateral base for market-wide liquidity support and ELA, given that a larger number of credit claims can be processed expeditiously.

- Seek greater domestic interagency information sharing and collaboration to enhance the operational preparedness for liquidity support (for example, via joint simulation exercises and horizon scanning).

- Communicate clearly to key financial institutions the specific information requirements in the context of ELA.

CRISIS MANAGEMENT AND FINANCIAL SAFETY NETS

54. Since 2014, Denmark's financial safety net and crisis management frameworks, including bank resolution, have improved significantly. In response to the 2014 FSAP and through transposition of pertinent European Union rules, Denmark has enacted major reforms such as new legislation for resolution and deposit insurance, introduction of a resolution framework for banks and MCIs, designation of two national resolution authorities (DFSA and the Financial Stability Company, FSC), changes to the governance of the deposit insurance system (DIS), and the revival of cross-border cooperation through the Nordic-Baltic Stability Group (NBSG), including a joint crisis simulation 2019. Denmark's financial safety net rests on sound legal foundations and its resolution strategy for small- and medium-sized banks has been successfully tested in practice.

55. The governance of the resolution authorities, and especially the FSC, should be strengthened by enhancing its operational autonomy. The FSC Board should be able to autonomously execute the FSC's mandate without interference from the government or the industry. The government should be involved in resolution decisions only when fiscal support is needed. The company's Board members should serve a term that is disconnected from the political cycle and sufficiently long to ensure the ability to develop pertinent expertise. A formal dismissal procedure should foresee that directors and manager can only be dismissed for certain causes and that a statement of reasons is given for their dismissal. In order to prevent perceived conflicts of interest, rules should prohibit active bankers to serve as FSC Board members.

56. Regarding SIFIs, further progress is needed to ensure the operational readiness to rapidly execute recovery and resolution measures. Notwithstanding ongoing efforts, the resolution planning process for SIFIs should be expedited, in particular the work on the priority areas already identified by the authorities such as operational continuity. More conceptual work is also needed, for example, regarding the potential use of a bridge MCI to ensure continuity of critical mortgage-related functions and for the practical execution of the bail-in tool.

57. The COVID-19 pandemic has underscored the importance of contingency planning. In particular, the authorities should define strategies for liquidity assistance for institutions in resolution. Without such a facility, the resolution framework is missing an important element. An institution in resolution may need liquidity to ensure the continuation of critical functions. The DN should be able to provide liquidity to enable resolution plans to be put into effect, subject to safeguards, to an institution which is considered systemic and viable and whose solvency concerns will be resolved with certainty and within a short time frame. The authorities will have to assess if the Resolution Fund (with back-up funding from the government) is well suited to secure the needed amounts within a short period of time and on a continuous basis.

58. Other aspects of domestic contingency planning and crisis management should be further enhanced. The Coordination Committee for Financial Stability needs to include the FSC as an important pillar of the financial safety net.[13] Under the auspices of the Coordination Committee, nationally coordinated crisis management and communication plans should be developed. The authorities should also test their operational readiness with a system-wide financial crisis simulation exercise.

[13] The Coordination Committee consists of high-level representatives from the MIBFA, MOF, DFSA, and DN and its tasks include coordinating the failure of a SIFI or coordination of financial crisis policy responses.

Box 1. Denmark: Key Policy Measures Taken in Response to the COVID-19 Pandemic

As of June 2020, the Danish authorities have implemented a range of measures to contain the spread of COVID-19 and to support the economy. Containment measures included closure of all borders, prohibition of events with more than 10 people, sending home non-essential public employees, and asking all private businesses to keep employees home when possible. More recently, the authorities announced a careful and gradual lift of some containment measures, while others would remain in place for a few more months.[1] Key policy responses to support economic activity and financial stability are summarized below:

Fiscal policies

- The authorities initially responded to the ongoing crisis by providing discretionary fiscal support of DKK 60 billion (2.6 percent of 2019 GDP). The increased spending will mainly finance additional health care needs and extraordinary budgetary measures to support workers and businesses. Another 6.2 percent of GDP in countercyclical support is expected to come through Denmark's strong automatic stabilizers—including from weaker tax receipts and higher social benefits. Temporary liquidity measures, including postponement of tax payments and government guarantees, will further support activity. More recently, the fiscal measures were adjusted, providing an additional DKK 30.7 billion in fiscal support (1.3 percent of 2019 GDP) and about DKK 70 billion (3.0 percent of 2019 GDP) in guarantees and liquidity measures. Likewise, a green renovation of public housing (DKK 30.2 billion or 1.3 percent of 2019 GDP) is planned for 2021-16.

Monetary and financial policies

- Danmarks Nationalbank (DN) announced on March 12 the launch of an "extraordinary lending facility" which was later expanded to a three-month collateralized lending operation. The new lending facility will ensure the banking sector access to liquidity at favorable terms, should the effects of the spread of Coronavirus have an impact on the liquidity situation in the Danish banking sector.

- The standing swap line with ECB was activated and its size was doubled to EUR 24 billion. It will remain in place as long as needed. DN also reached an agreement with the Federal Reserve to establish a USD 30 billion swap line that will stand for at least 6 months.

- Although DN increased the policy rate by 15 basis points to –0.6 percent, monetary policy rates remain lower in Denmark than in the euro area. The DN continues to maintain the krone's tight peg to the euro.

- The authorities preemptively released the countercyclical capital buffer and canceled planned increases meant to take effect later (March 12).

- The Danish Financial Supervisory Authority (DFSA) also announced a case by case relaxation of regulation on the liquidity coverage ratio (LCR) requirement. Banks and insurance companies are urged by the DFSA not to pay out dividends or buy back shares (March 30).

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[1] For details: https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19

Box 2. Denmark: The Danske Bank Case: A Summary

This box briefly discusses the possible laundering of up to $230 billion in payments through the Estonian branch of Danske Bank from 2007-2015.

- Danske Bank acquired Finnish Sampo Bank in 2007, converting it into a branch of Danske Bank A/S in 2008.
- From 2007-2015, the Danske Bank branch in Estonia serviced a total of approximately 15,000 non-resident customers, both within and outside its International Banking Department.
- Over that time frame, external parties transferred approximately DKK 1,500 billion ($230 billion) to the Estonian branch's non-resident customers, who then forwarded a similar sum to external recipients.
- Danske Bank relied on global correspondent banks to handle the dollar clearing for these transfers; JP Morgan terminated its correspondent banking relationship with the Estonian branch in 2013, with Bank of America and Deutsche Bank's U.S. subsidiary following suit in 2015.
- In December 2017, Danske Bank announced that it had been fined DKK 12.5 million ($2 million) by the Danish authorities for violating AML/CFT rules in relation to the monitoring of transactions to and from correspondent banks.
- In September 2018, Danske Bank released a report on the results of an internal investigation which concluded that a large proportion of the transfers described above consisted of suspicious and potentially illegal activities likely related to money laundering and stated that the AML/CFT procedures at its Estonian branch had been "manifestly insufficient and inadequate".
- In January 2019, the DFSA released a report on its supervision of Danske Bank as regards this case.
- In February 2019, the European Banking Authority's (EBA's) Board of Supervisors (BoS) set up a panel to investigate any possible breach of European Union law in connection with the Danish and Estonian financial supervisory authorities' (DFSA's and EFSA's) supervision of Danske Bank and its Estonian branch.
- In April 2019, the EBA BoS, while acknowledging past failings of the DFSA and EFSA's supervision, rejected the panel's recommendation with respect to the breach of union law proceeding.
- In October 2019, Danske Bank announced that its Estonian business had entered into liquidation in response to an EFSA order.

Sources: Report on the Danish FSA's Supervision of Danske Bank as Regards the Estonia Case (DFSA, 2019), Report on the Non-Resident Portfolio at Danske Bank's Estonian Branch (Bruun & Hjejle, 2018).

Box 3. Denmark: Key Elements of the Danish Mortgage Finance System

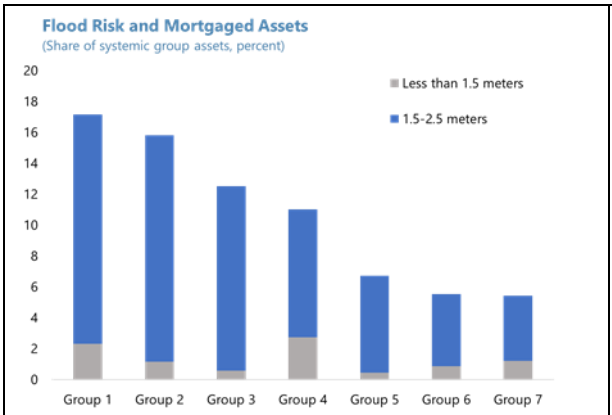
MCIs business activities are limited to the provision of mortgage loans (legally they are not allowed to accept deposits). The loans must be funded by the issuance of covered bonds backed by assets segregated in bankruptcy remote capital centers (which are still on the balance sheet of the MCI), and a residual claim (ranking senior to non-covered bond creditors) on the general balance sheet if the assets of the capital center cannot fully cover the investor's exposure. A margin over the covered bond cost is charged to cover administrative costs, risk, and profit.

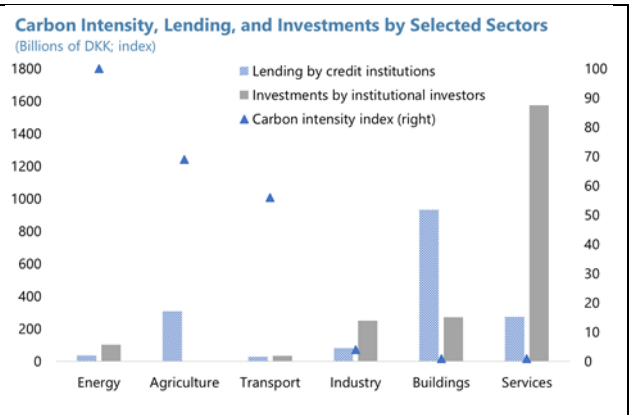
In contrast to other covered bond legal frameworks, all issuers are required to apply a balance principle which serves as a strict asset-liability management mechanism. As a result, a close connection exists between timing and amount of payments from the underlying mortgage loans to the covered bond investors. That is, mortgage loan-related cash flows are passed through to the covered bond investor. The balance principle, in addition to other rules (such as overcollateralization, and stress tests) implies that issuers substantively reduce their exposure to market risks (interest rate, foreign exchange, and prepayment risks), as they are passed on to the covered bond investor. Moreover, refinancing risk has been attenuated by legislation which allows for the extension of a bond's maturity by one year if a refinancing auction fails or if interest rates have risen by more than five percentage points in the preceding year.

Box 4. Denmark: Climate Change and Financial Stability in Denmark

Flood-related disasters are one of the main physical risks associated with climate change confronting Denmark. Many Danish cities and large towns are located along the coastline with many buildings situated in low-lying areas. In terms of financial stability, this renders a sizeable share of banking assets prone to flood-induced risks. Estimates by the Danmarks Nationalbank (2019) suggest that although 1½ percent of mortgage assets serving as collateral are currently at risk of flooding, this share could increase to 13 percent. Bearing in mind the uncertainty of such estimates, currently 1-3 percent of SIFIs' mortgaged assets are at risk of flooding, but for two SIFIs, this estimate could exceed 15 percent reflecting their greater exposure to rising sea levels.

The financial sector has relatively limited exposure to the highest carbon-emitting industries. Credit institutions have generally provided lending to corporate customers in industries with less carbon-intensive production processes (accounting for 23 percent of corporate sector lending). However, transition risks are larger for institutions with large exposures to the agricultural sector (especially relevant for smaller banks) and the energy sector.

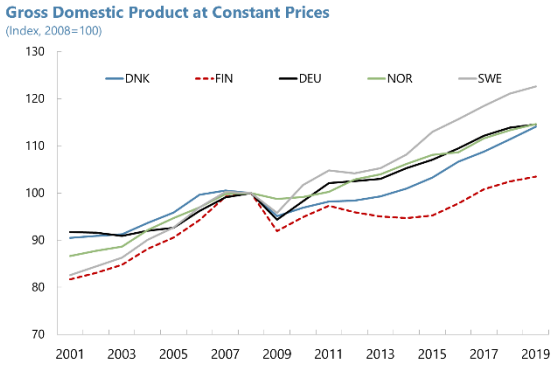




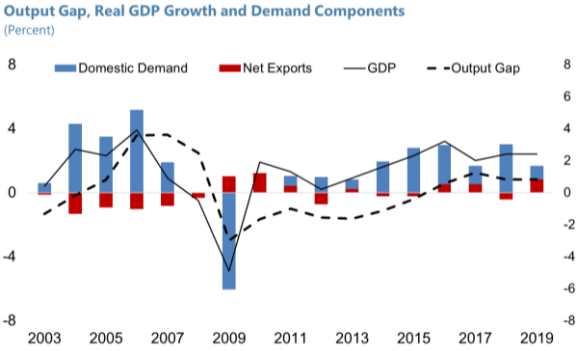
Source: Danmarks Nationalbank (2019), "Climate Change Can Have a Spillover Effect on Financial Stability, Analysis No. 26 (December).

Figure 1. Denmark: Macroeconomic Developments

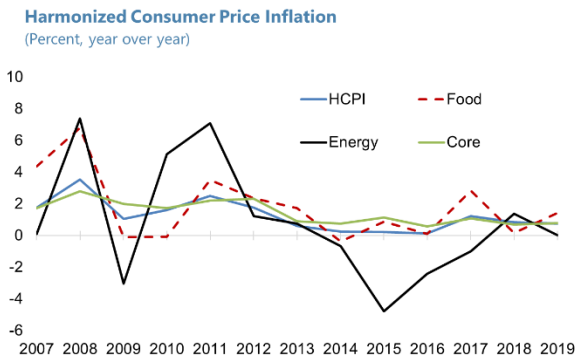
After a tepid recovery from the global financial crisis…



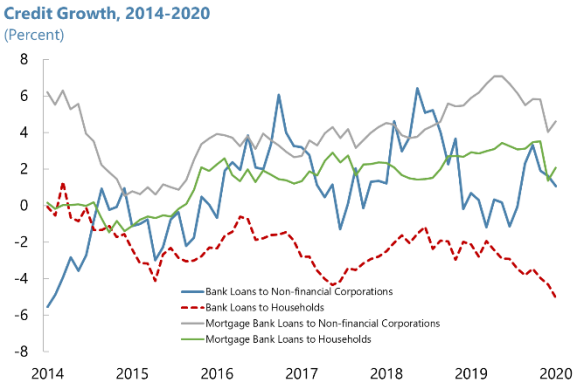
…growth has exceeded potential in recent years before the onset of the COVID-19 pandemic.



Inflation continues to hover below one percent despite a positive output gap.



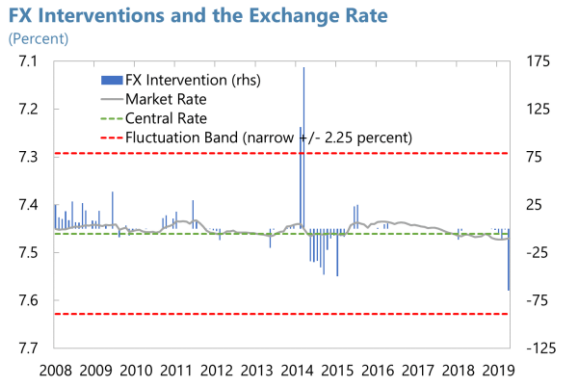
Credit growth has declined in recent months.



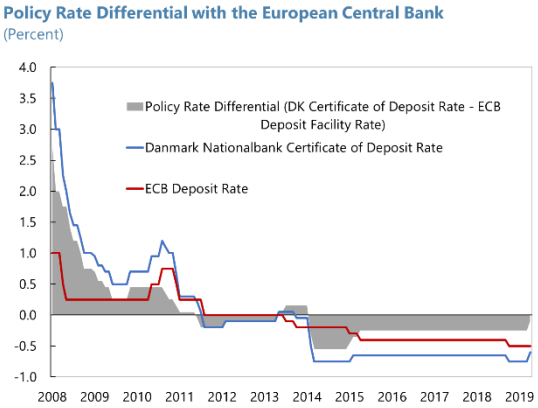
Sources: OECD, Haver, BIS, Statistics Denmark, IMF staff calculations, Danmarks Nationalbank.
Note: In panel 5, overall PMI and production index is shown. In panel 6, consumer confidence is based on the general economy over the next 12 months.

Figure 2. Denmark: Monetary Policy, Operations, and FX Markets

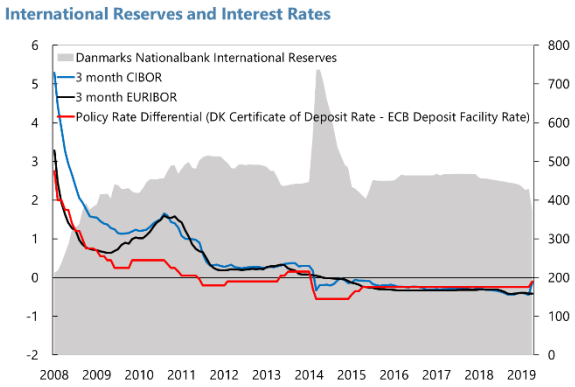
DN has managed to keep the exchange rate with the fluctuation band.



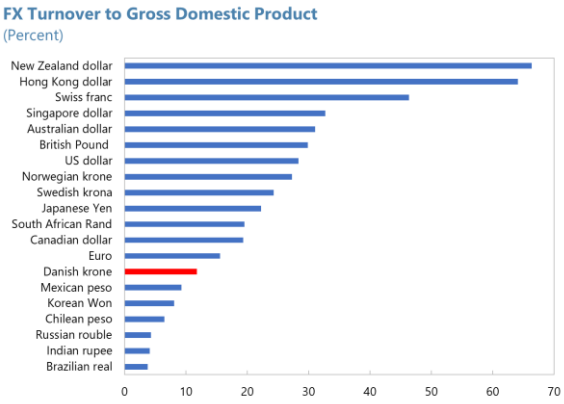
DN has reacted via interest rate adjustments in episodes of pertinent capital flows (European debt crisis, COVID-19 pandemic).



DN's response to the COVID-19 pandemic also included purchases of DKK, reducing international reserves.



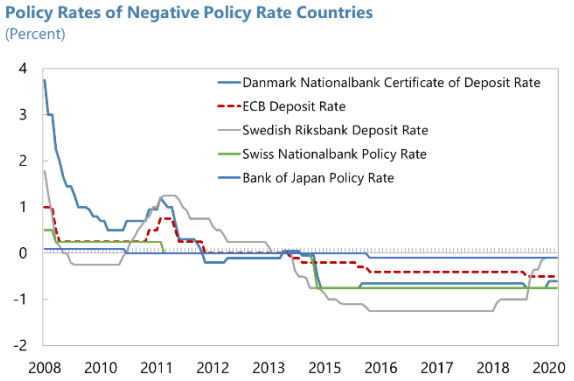
Turnover in Danish kroner is small relative to other European or Nordic currencies.



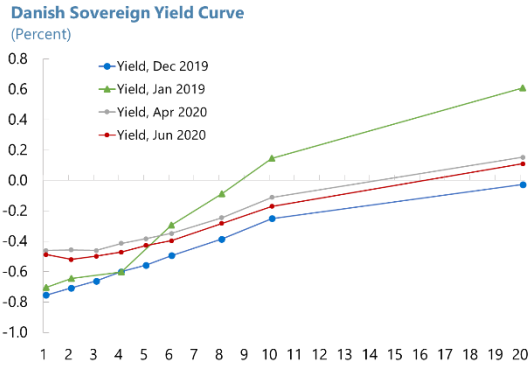
Sources: Haver, Danmarks Nationalbank, ECB, IMF staff calculations.
Notes: In panel 1, the market rate is in DKK/Euro and the FX Interventions is in DKK billion. In panel 3 international reserves are in DKK billions and interest rates are in percent.

Figure 3. Denmark: Monetary and Financial Conditions

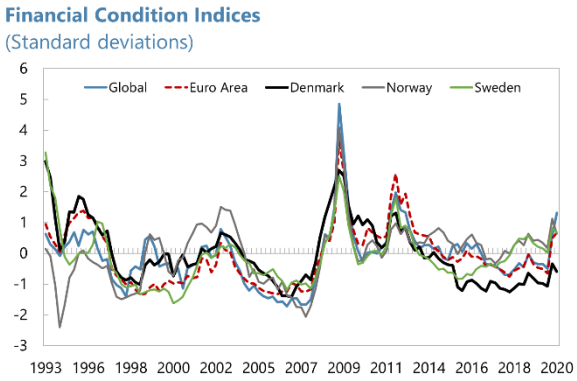
Danish policy rates are among the lowest in the world and have been negative since mid-2012.



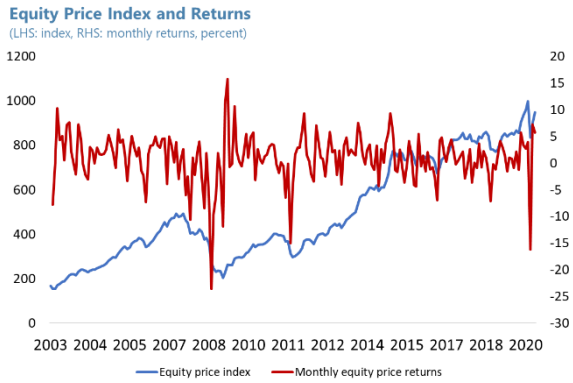
Bond yields are negative for all maturities.



After a spike in March 2020, financial conditions have eased…

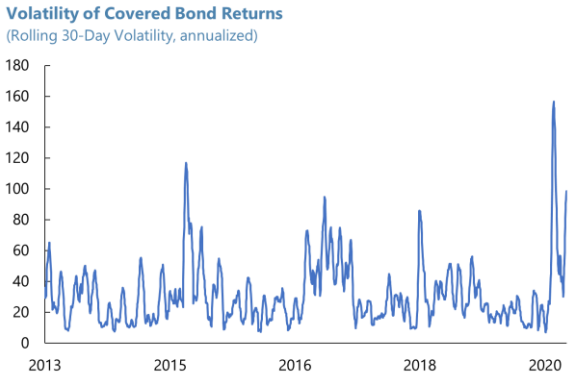


…reflecting in part the rebound in equity prices,…



…a decline in covered bond spreads…

…and some respite in covered bond return volatility.

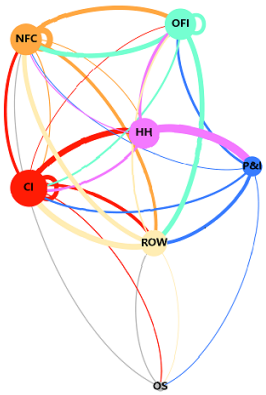


Sources: Bloomberg, Haver, IMF staff calculations.

Figure 4. Denmark: Cross-Sectoral Interconnectedness

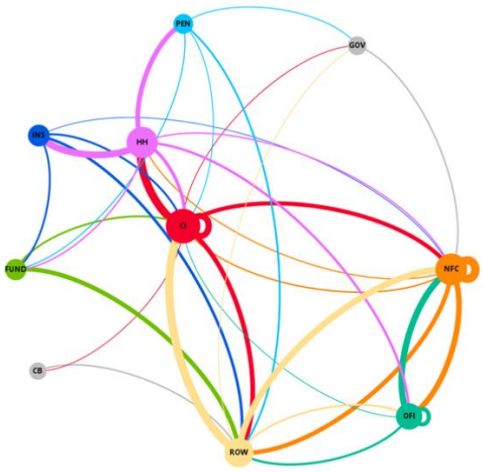
Housing asset exposures interlink credit institutions (mostly banks and mortgage credit institutions) with institutional investors (insurance companies, pension and investment funds) and the household sector.

Cross-sectoral Network Map



A more detailed network depiction highlights the central role of credit institutions with strong interlinkages within and across sectors mostly through loans and covered bonds. The nonfinancial corporate sector accounts for the largest intersectoral linkages owing to equity exposures and intercompany lending.

Detailed Cross-sectoral Network Map

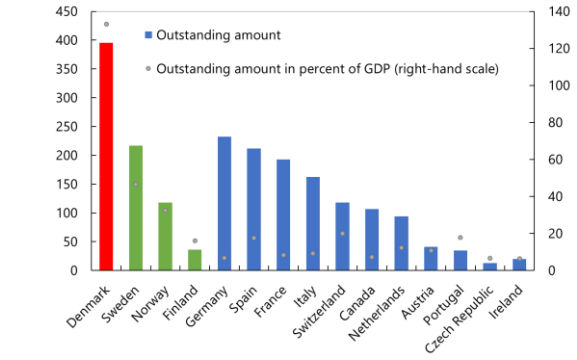


Note: Node size reflects the magnitude of total assets for each sector, line thickness is proportional to the normalized size of bilateral links with respect to total system assets, and line color represents exposure direction, where it matches the color of the exposed sector for a given link. NFC, CB, CI, FUND, OFI, INS, PEN, GOV, HH, and ROW denote the nonfinancial corporate sector, central bank, credit intermediaries (including banks and mortgage credit institutions), investment funds, other financial institution, insurance companies, pension funds, public sector, household sector, and the rest of the world, respectively.

Figure 5. Denmark: Covered Bond Market

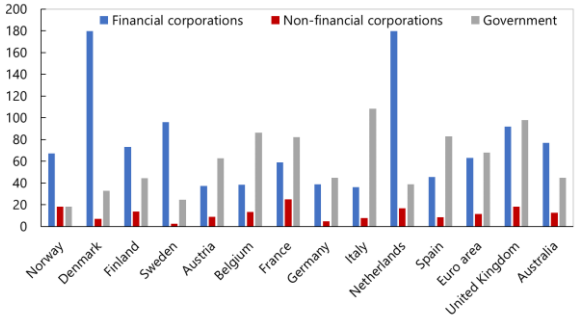
The Danish covered bond market is the largest in the world.

Mortgage Covered Bonds Outstanding
(Billion of euros)



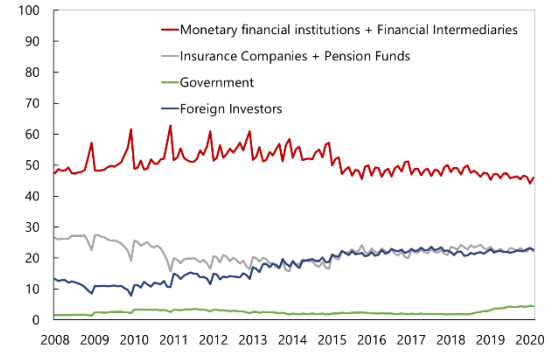
Debt securities issues by banks dominate the domestic fixed income segment which includes government bonds.

Debt Securities to Gross Domestic Product - Issuer Breakdown
(Percent)



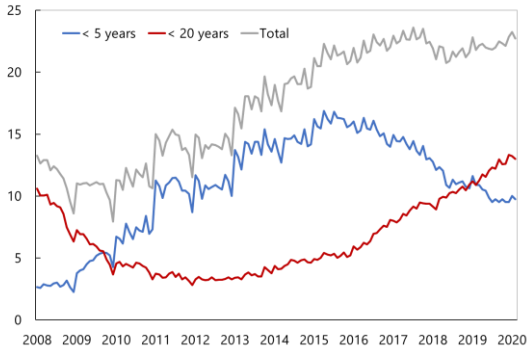
The large and stable share of bank covered bond holdings suggests a high level of interconnectedness.

Covered Bonds Investor Breakdown
(Percent)



The role of foreign investors is increasing, particularly for longer maturity covered bonds.

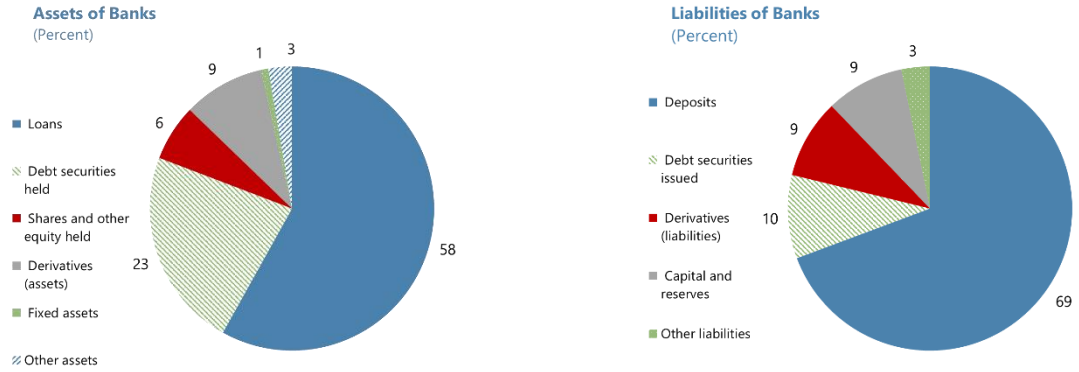
Foreign Investors' Ownership Share of Covered Bonds
(Percent)



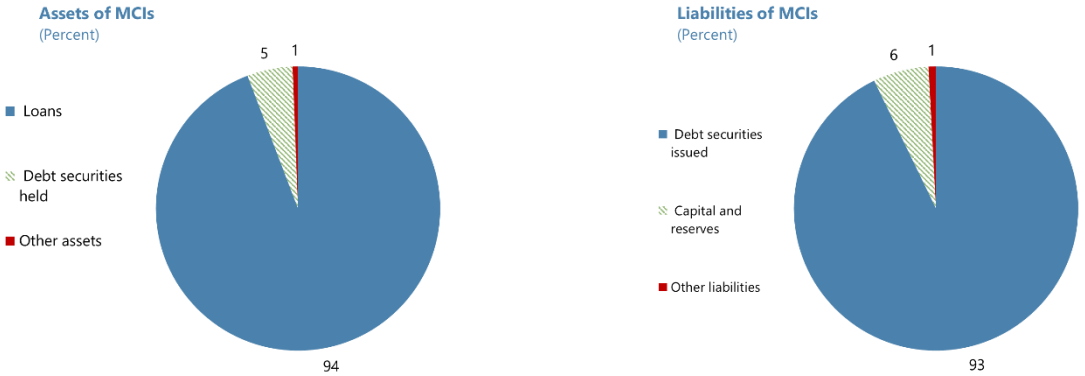
Sources: Danmarks Nationalbank.

Figure 6. Denmark: Assets and Liabilities of MFIs

Within groups, commercial banks using deposit funding to finance retail lending and mortgages.



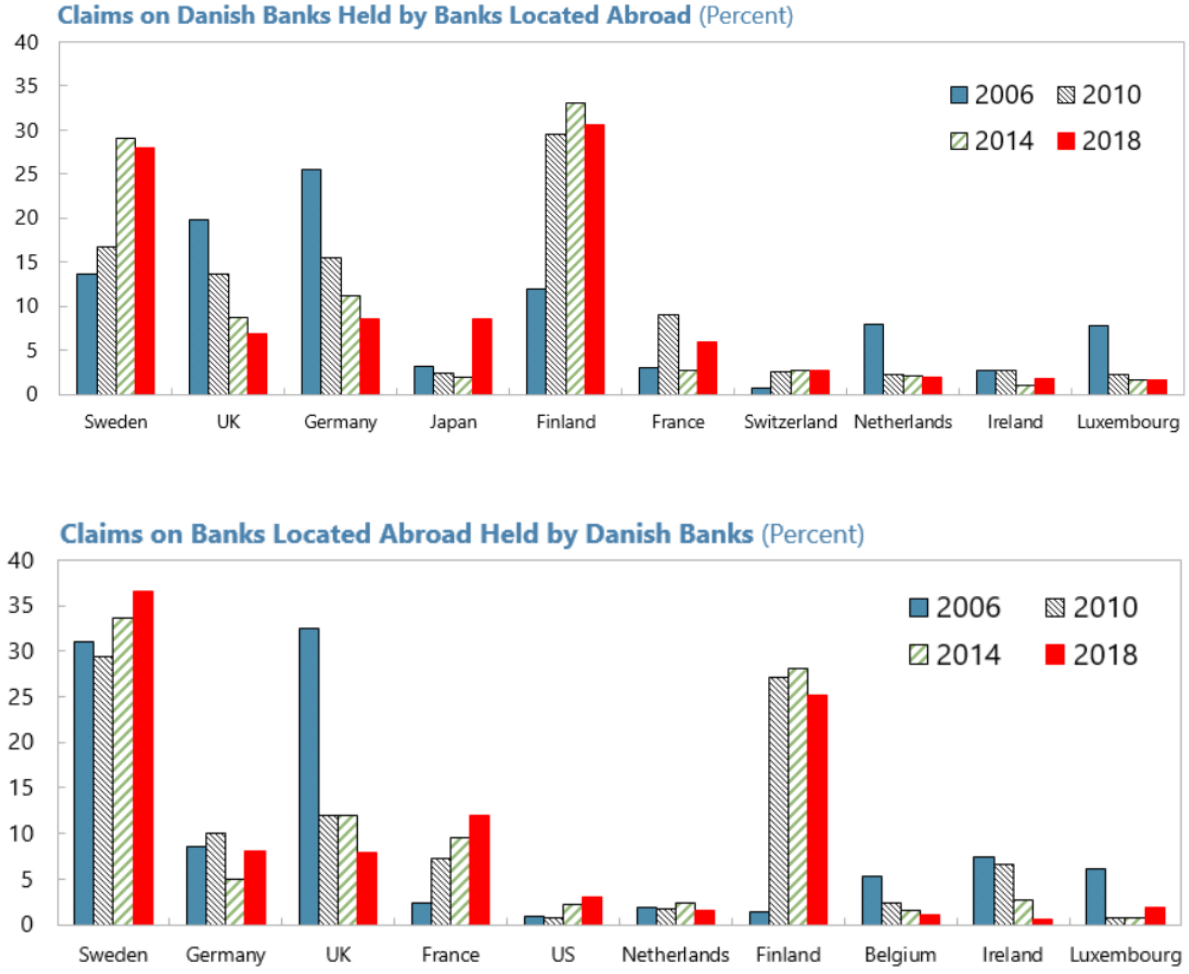
Mortgage credit institutions (MCIs) issue covered bonds to finance the mortgage portfolios originated by banks.



Sources: Statistics Denmark.
Notes: Total assets and liabilities are calculated by summing the components, and not taken directly from the reported total MCI.

Figure 7. Denmark: Cross-border Holdings of Bank Claims

The Danish banking system has strong regional linkages, including with other Nordic countries.

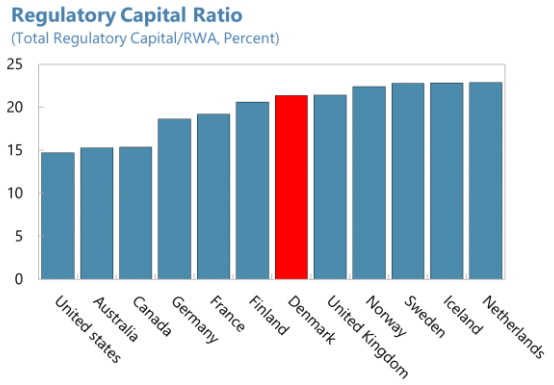


Sources: Bank for International Settlements.

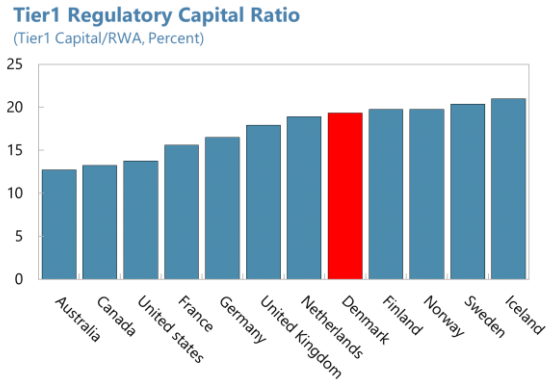
Notes: This figure depicts the share of total liabilities of Denmark at banks located in other BIS-LBS reporting countries. The countries with the ten highest shares in 2017 are included. Non-BIS-LBS reporting countries' liabilities are not included in this calculation (non-reporting countries including Estonia, Latvia, Lithuania, and Russia). Denmark reports claims and liabilities to other countries in the publicly available BIS-LBS data. Total outstanding liabilities of Denmark in other countries are aggregated based on the location or residence of banks and their subsidiaries and offices, irrespective of the location of the headquarter of the parent bank. For example: If a bank in Denmark holds deposits at the subsidiary of a Swedish bank in Finland, the liabilities will be included as liabilities of Denmark in Finland.

Figure 8. Denmark: Comparison of Selected Financial Indicators

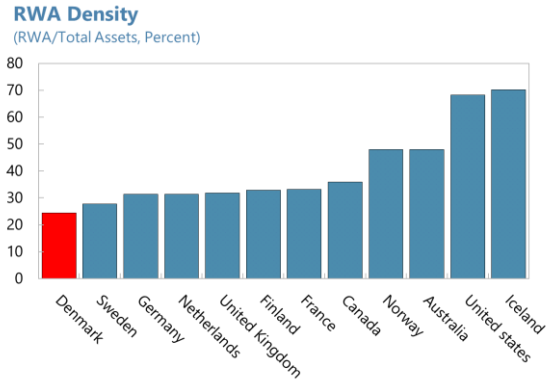
Danish banks' regulatory capital ratios are high relative to peers…



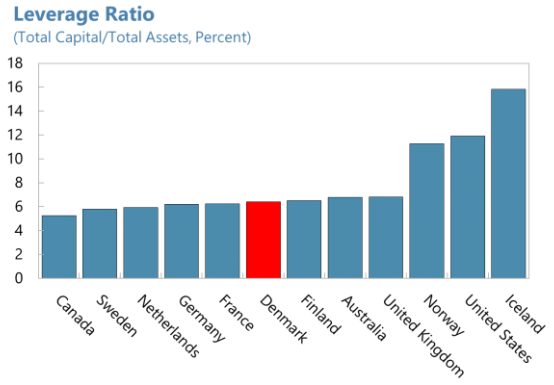
…particularly for Tier1 capital ratios.



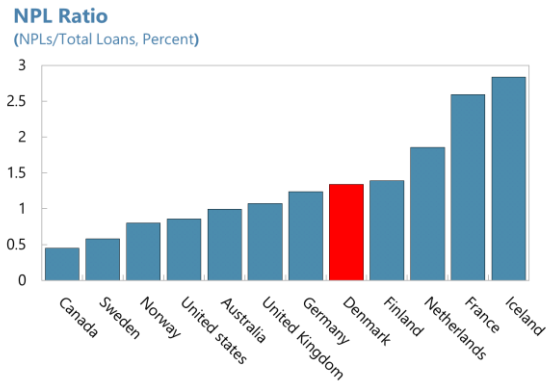
This is, however, largely driven by low risk weighted asset density…



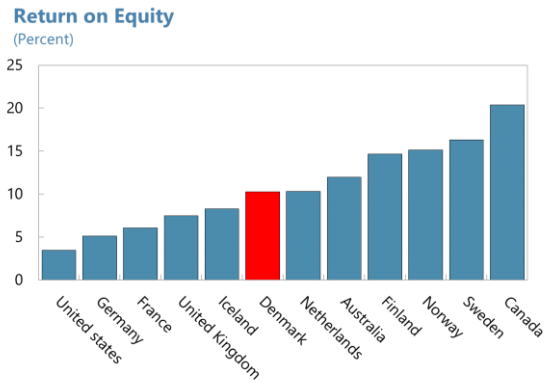
…and leverage ratios are relatively low.



Asset quality is comparatively moderate…



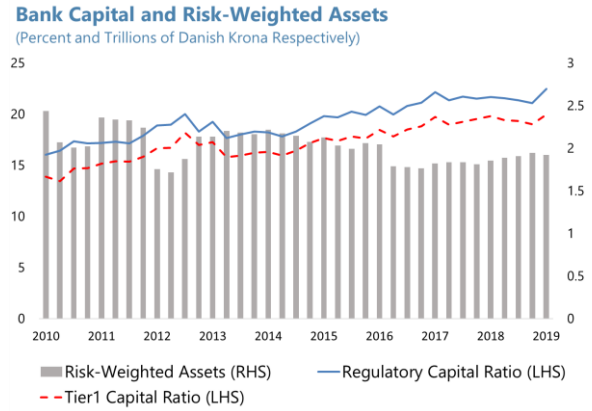
…as is profitability.



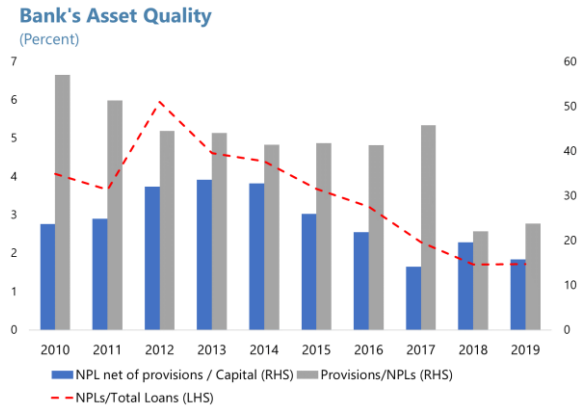
Sources: IMF FSI.
Note: latest available.

Figure 9. Denmark: Performance Indicators for Financial Institutions

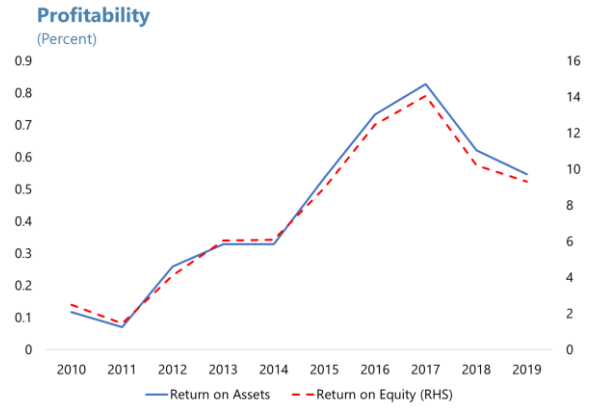
Bank capital ratios have been rising since 2010….



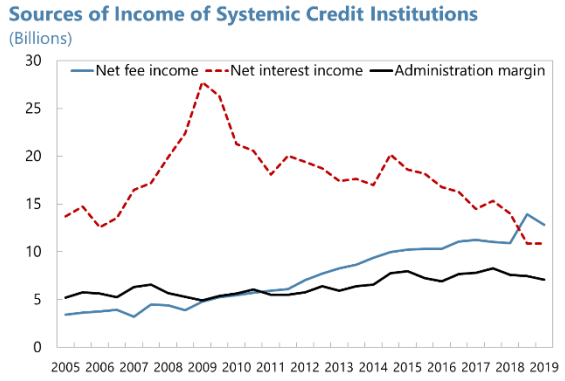
…alongside a reduction in NPL ratios and provisions.



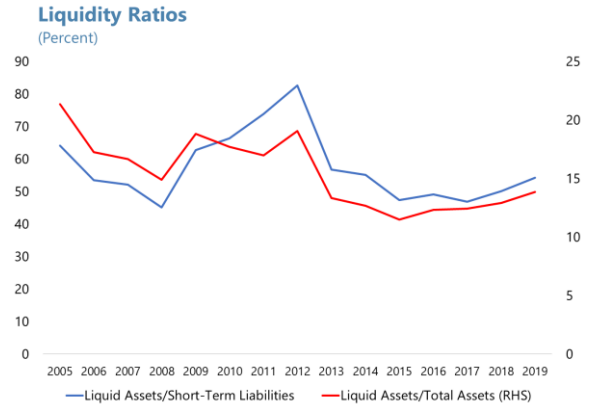
Bank profitability has recovered since 2010, but has been declining in recent years even before the COVID-19 shock…



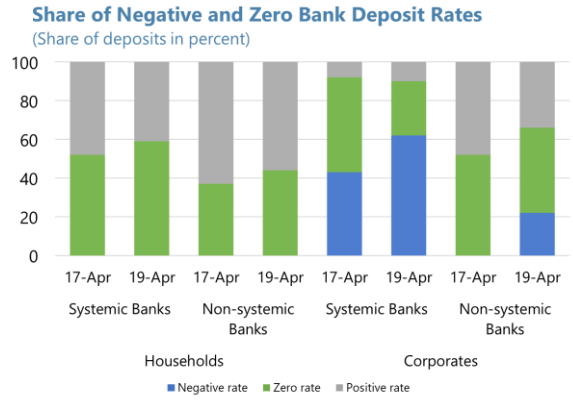
…with rising noninterest income helping to offset a persistent decline in net interest income.



Liquidity ratios are moderate.



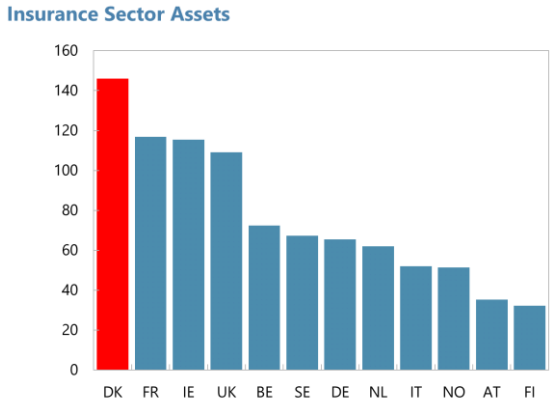
To mitigate the decline in net interest income, systemic banks have been passing negative rates to depositors.



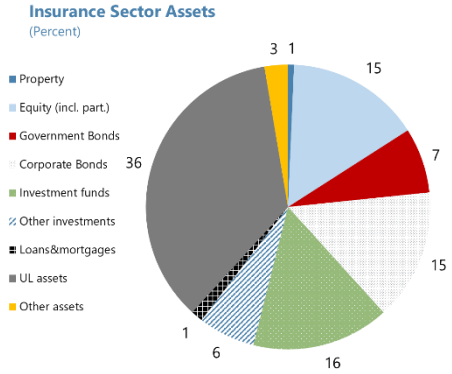
Sources: IMF Financial Soundness Indicator database (which covers up to 67 deposit-taking institutions) and Danmarks Nationalbank.

Figure 10. Denmark: Insurance and Pension Fund Sector

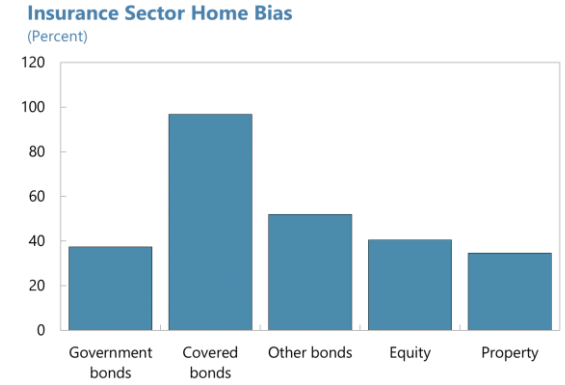
The life insurance sector is large compared to European peers as it also manages occupational pension funds.



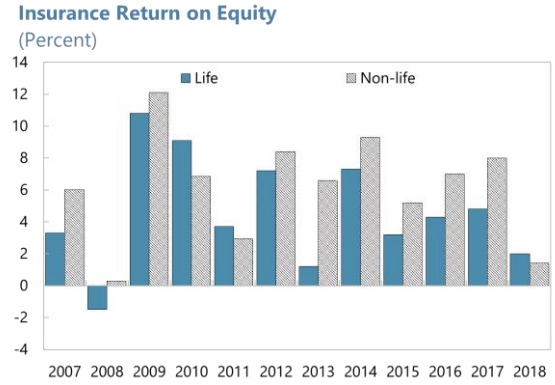
More than one third of life insurance assets are backing unit-linked policies where market risks are fully borne by policyholders.



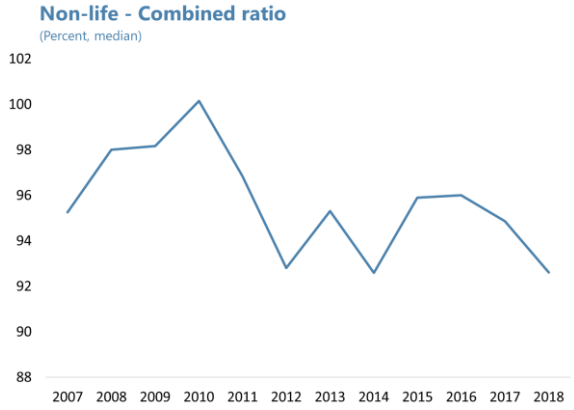
Domestic investments in covered bonds is nearly 100 percent, notably greater than in other asset classes.



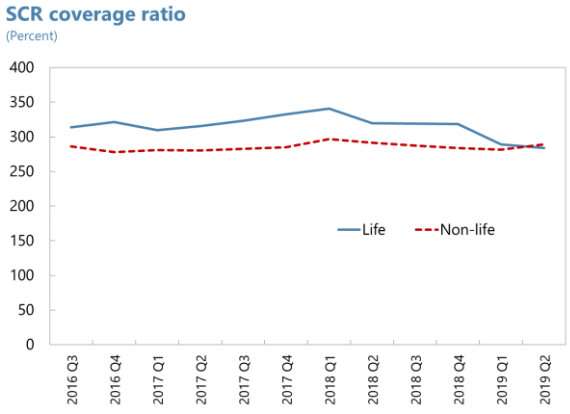
Profitability in the life sector is only modest and sensitive to investment returns…



…whereas in the non-life sector, profitability benefits from low combined ratios.



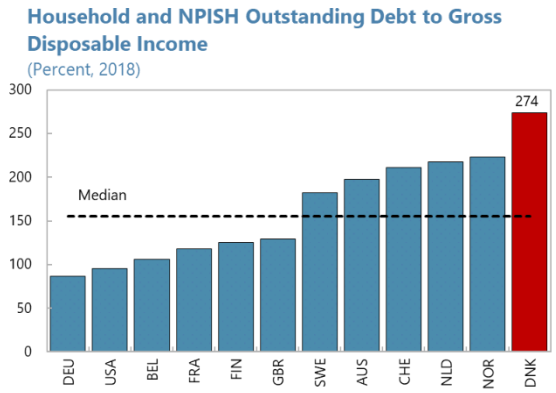
Solvency ratios are on average well above regulatory thresholds.



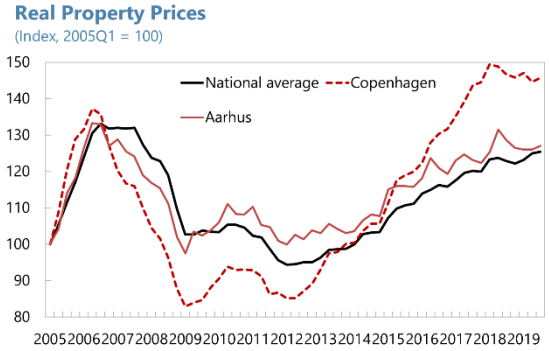
Sources: EIOPA, DFSA, Eurostat.

Figure 11. Denmark: Household-Sector Vulnerabilities

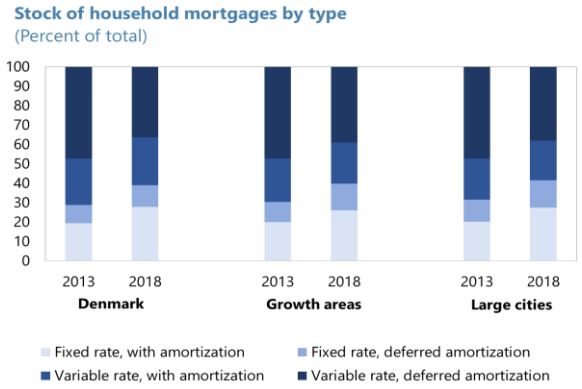
Danish households' indebtedness is among the highest in advanced economies.



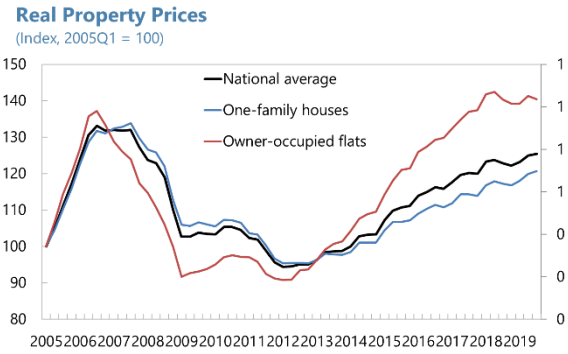
Elevated prices in the capital region expose households to house price shocks…



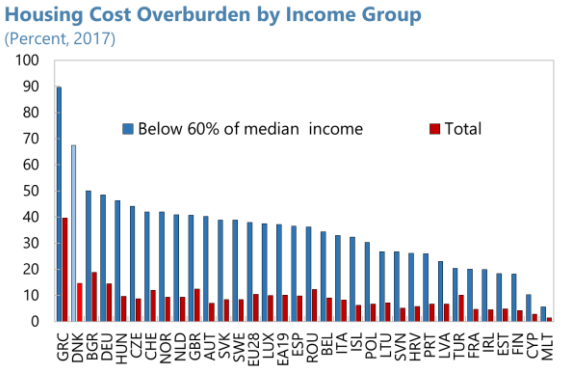
Despite improvements, the share of mortgages on variable terms remains high…



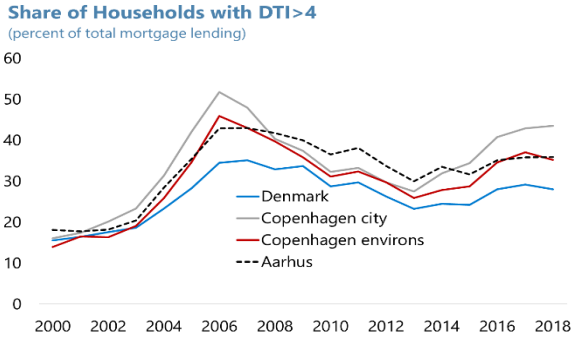
House prices remain high and have stabilized recently in response to prudential measures.



…low income households also appear to be particularly vulnerable.



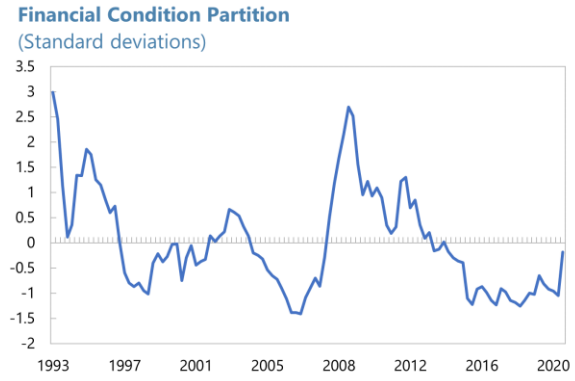
…which coupled with rising DTIs may compound risks.



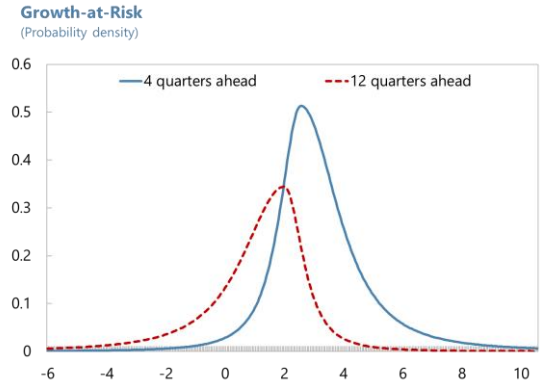
Sources: Danmarks Nationalbank, Association of Danish Mortgage Banks, Statistics Denmark, Eurostat, IMF staff calculations.
Notes: Real property prices are calcualted using CPI as the deflator. National averages is the weighted average of owner-occupied flats and one-family houses nationally. The housing cost overburden refers to the percentage of the population living in a household where total housing costs (net of housing allowances) and represents more than 40% of the total disposable household income (net of housing allowances); DNK, LVA, and HUN are 2018 data, and ISL is 2015 data.

Figure 12. Denmark: Growth-at-Risk

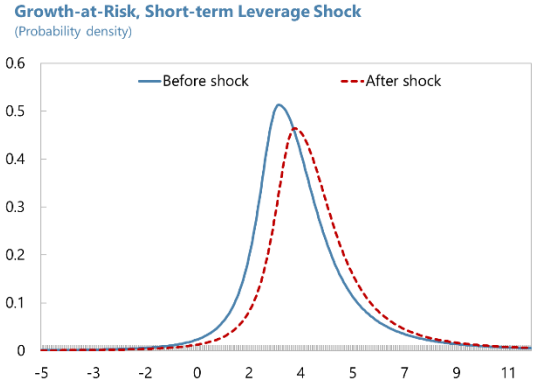
Financial conditions remain accommodative despite a hike in March 2020 (which then gave way to some easing)…



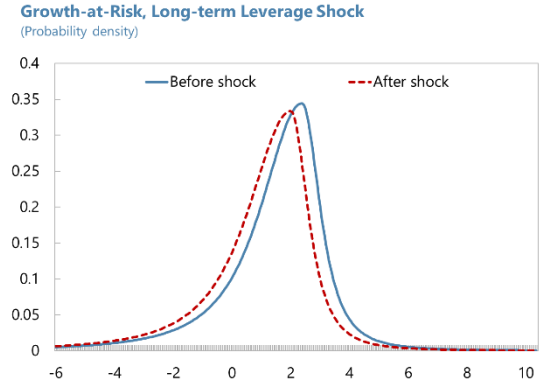
…stimulating growth in the near term, but with a greater risk of a medium-term downturn.



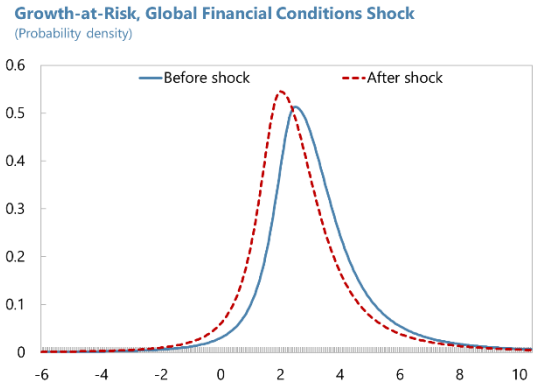
Greater household debt is associated with more favorable short-term prospects…

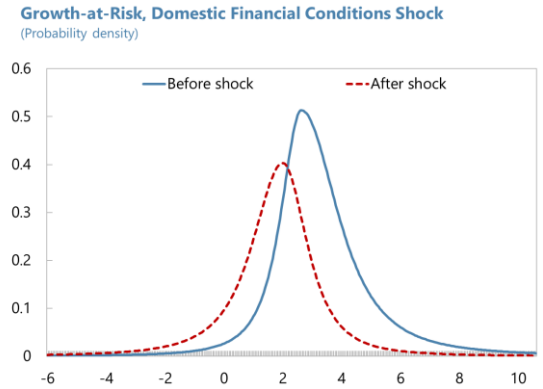


…but, by exacerbating vulnerabilities, increases the chances of a slowdown over the medium term.



Any further tightening of global, regional, or domestic financial conditions, possibly associated with the COVID-19 pandemic could dampen the economic outlook.





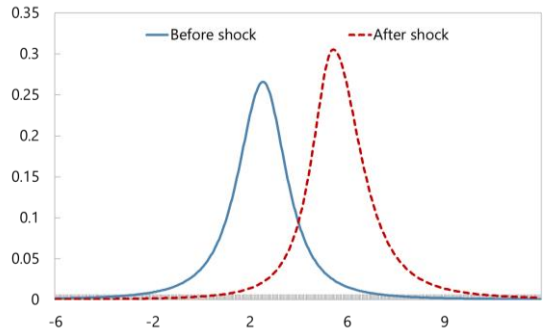
Sources: IMF staff calculations.
Notes: Short- and long-term refer to 4 and 12 quarters ahead, respectively; one standard deviation shocks are simulated.

Figure 13. Denmark: House Prices at Risk

Greater household debt is associated with more favorable prospects for house prices in the short term….

House Prices-at-Risk, Short-Term Leverage Shock

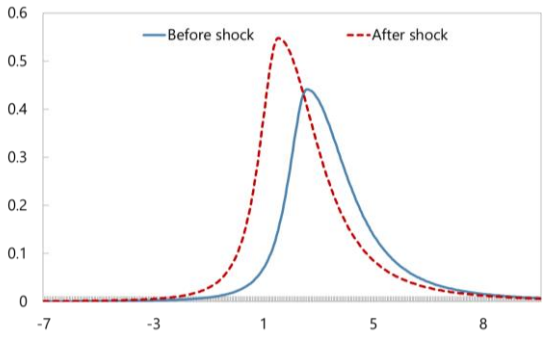
(Probability density, Denmark)



….but increases the risk of a sharp decline over the medium term.

House Prices-at-Risk, Long-Term Leverage Shock

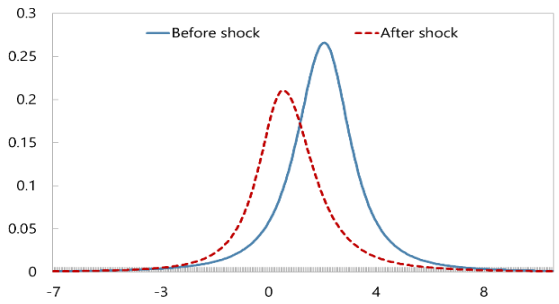
(Probability density, Denmark)



A sudden tightening of financial conditions would increase downside risks to house prices….

House Prices-at-Risk, Short-Term Financial Conditions Shock

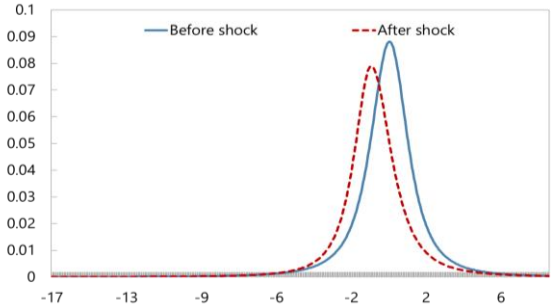
(Probability density, Denmark)



…. with the impact being larger for Copenhagen than the national average.

House Prices-at-Risk, Short-Term Financial Conditions Shock

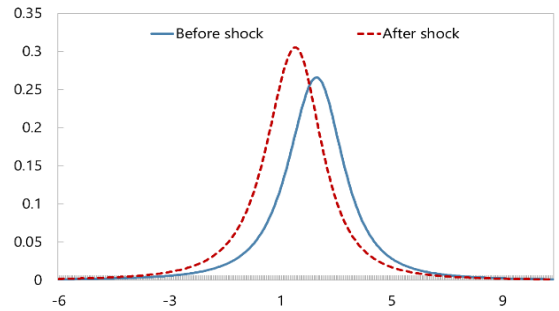
(Probability density, Copenhagen)



A valuation shock, possibly associated with COVID-19 shock, could also increases downside risks to house prices…

House Prices-at-Risk, Short-Term Valuation Shock

(Probability density, Denmark)



….with a potentially stronger impact in Copenhagen.

House Prices-at-Risk, Short-Term Valuation Shock

(Probability density, Copenhagen)

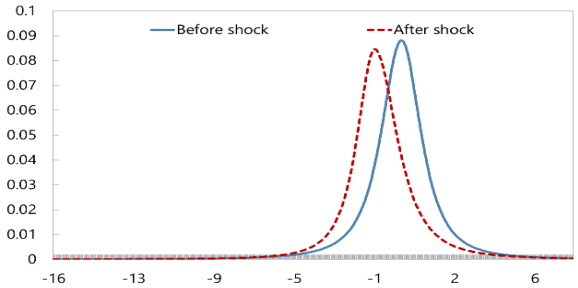
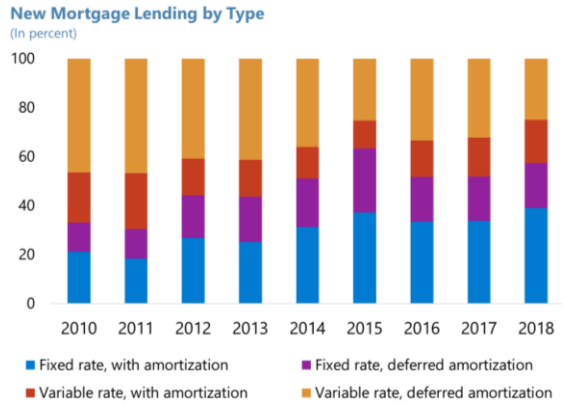
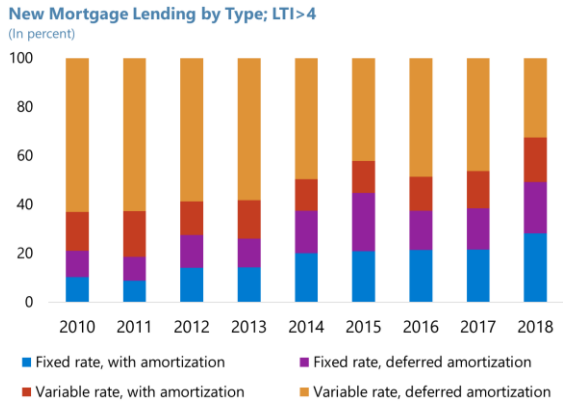


Figure 14. Denmark: Housing Finance-Related Vulnerabilities

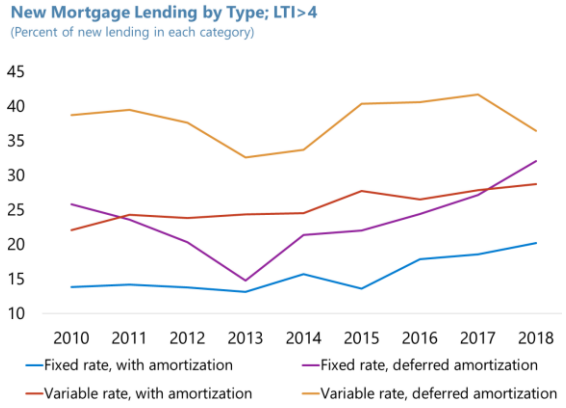
Recent measures have reduced the share of interest-only, variable rate loans in new lending.



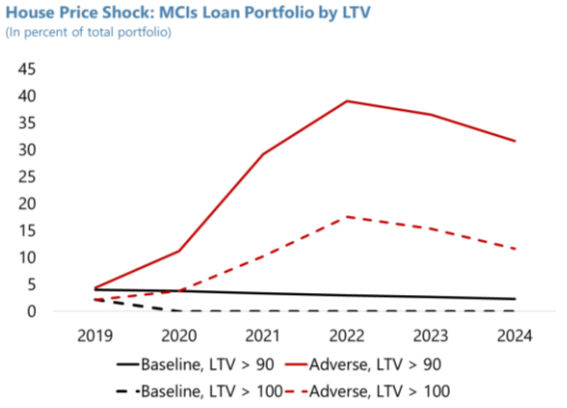
However, a large share of highly indebted households still borrow on variable and/or deferred amortization terms.



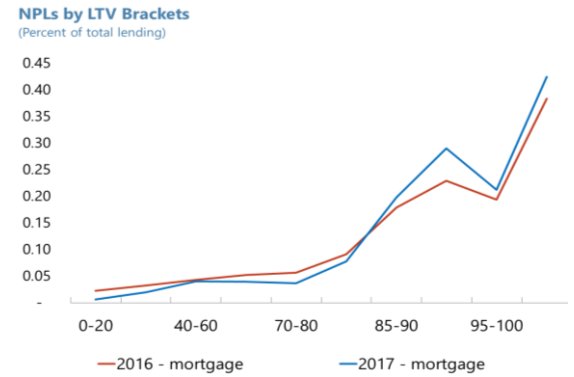
Indebted households continue to get deferred amortization loans, but have shifted from variable to fixed rates.



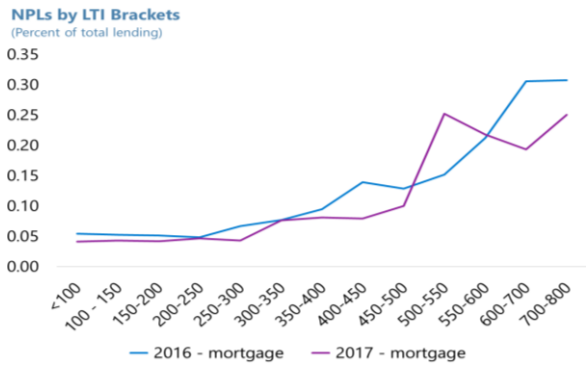
A large house price shock would shift a significant part of the mortgage portfolio over LTV greater than 100 percent.



Households NPLs increase non-linearly with LTVs, with a break after an LTV of 85 percent…



…and a break of an LTI of 500.

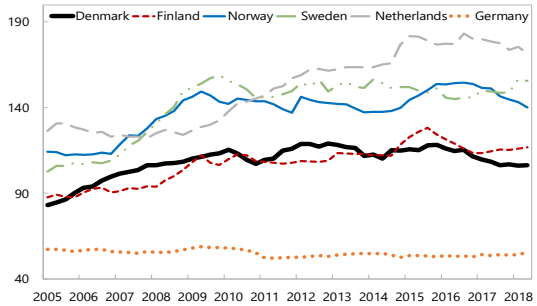


Sources: Danmarks Nationalbank.

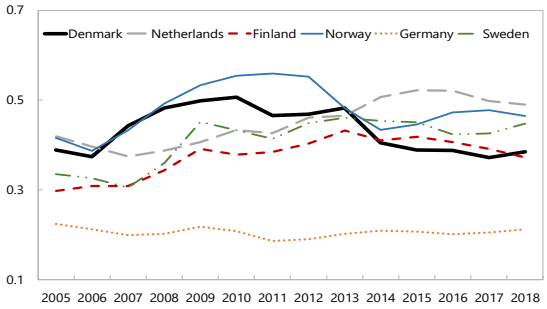
Figure 15. Denmark: Debt of Non-financial Corporations (NFCs)

Despite an overall decline in non-financial corporate debt before the onset of the COVID-19 pandemic, evidence suggests an increase in leverage of firms in cyclical sectors, especially in the (commercial) real estate sector.

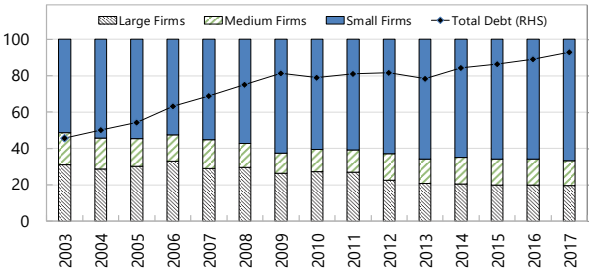
Debt-to-GDP Ratio in Selected Countries
(Percent)



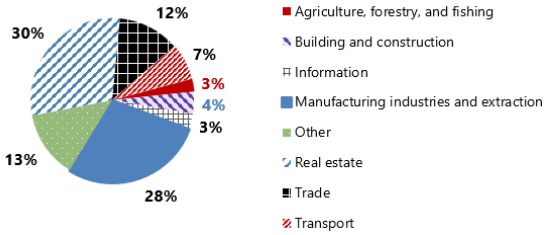
Debt Service-to-Income Ratio in Selected Countries



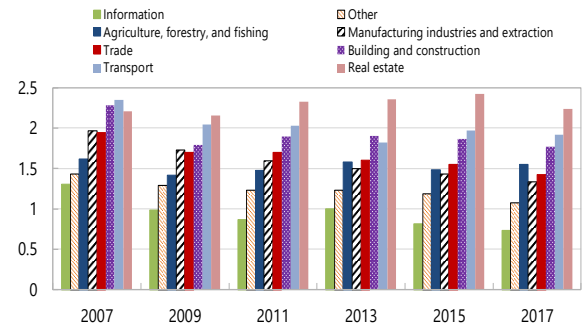
Debt by Firm Size
(Percent, billions DKK)



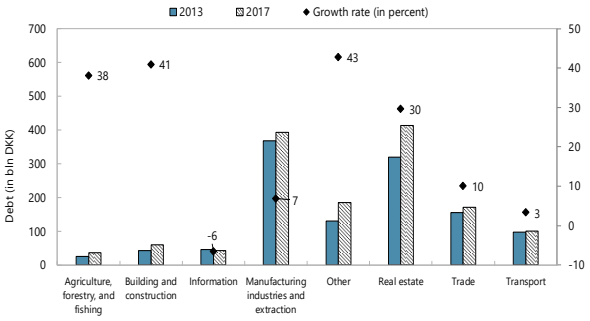
Debt by Sector in 2017
(Total NFC debt 1,400 billion DKK)



Debt-to-Equity Ratios, by Sector
(Median)



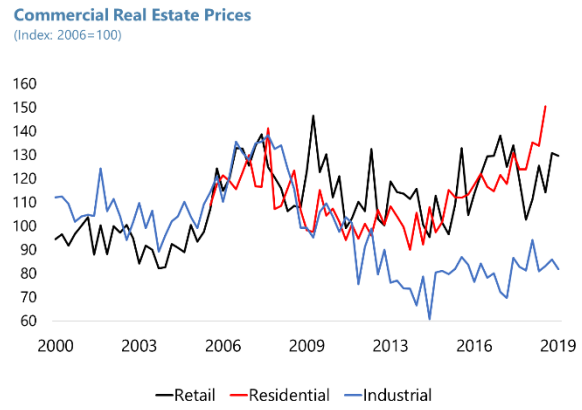
Debt Growth by Sector (2013-2017)
(Billions DKK)



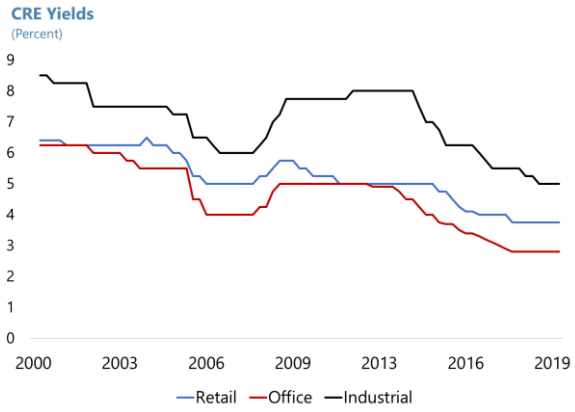
Sources: Danmarks Nationalbank, BIS.

Figure 16. Denmark: Commercial Real Estate

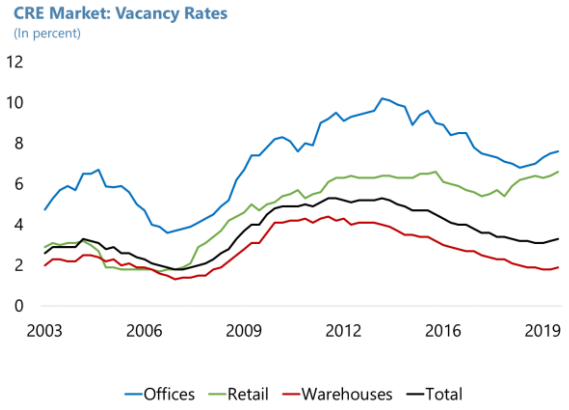
Prices in the commercial real estate market continue to grow….



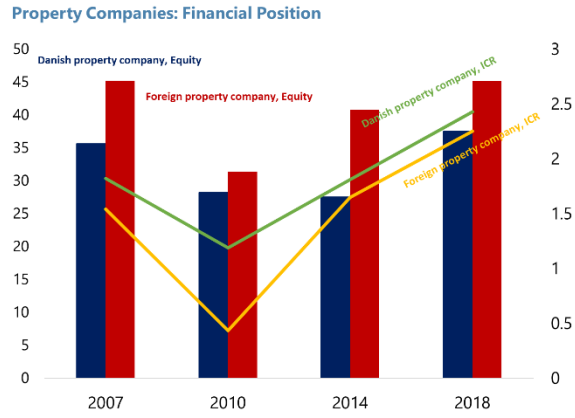
…. alongside a decline in the required yield in various segments



Vacancy rates have increase in some segments, which may affect their income generation capacity…



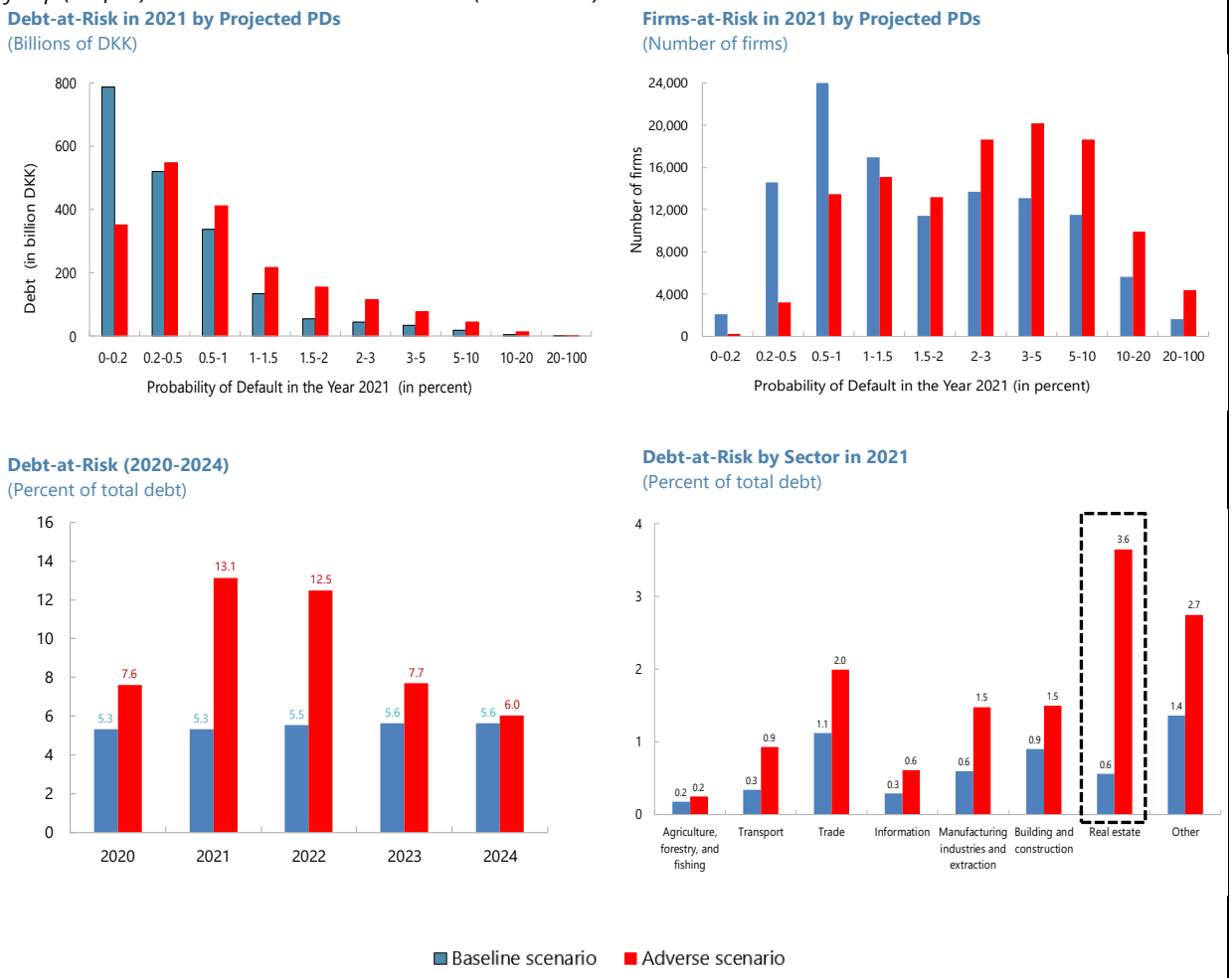
However, property companies' financial position has improved since the past crisis.



Sources: Danmarks Nationalbank.

Figure 17. Denmark: Pre-COVID Default Risk Analysis: Nonfinancial Corporate Sector

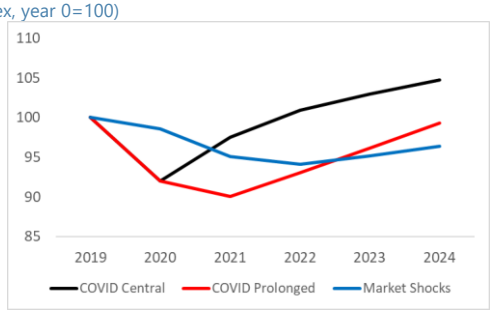
Firm-level analysis reveals an increase in projected PDs in the pre-COVID adverse scenario, which peak in 2021. The highest jump (six-fold) in debt-at-risk is observed in the (commercial) real estate sector.



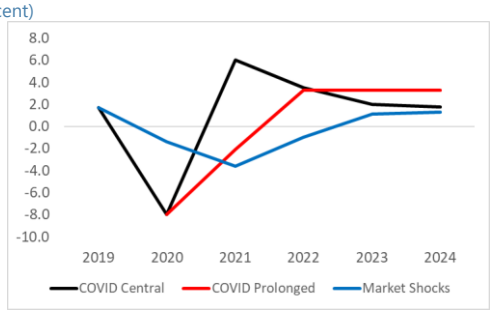
Sources: Danmarks Nationalbank, IMF staff calculations.
Note: Estimated firm-level PDs are based on sector-specific default probability models. In panels 3 and 4, debt-at-risk (firms-at-risk) is calculated by aggregating debt of firms (number of firms) with projected PDs above 1.5 percent.

Figure 18. Denmark: Macroeconomic Scenarios for Stress Testing

Real GDP Level
(Index, year 0=100)



Real GDP Growth Rates
(Percent)



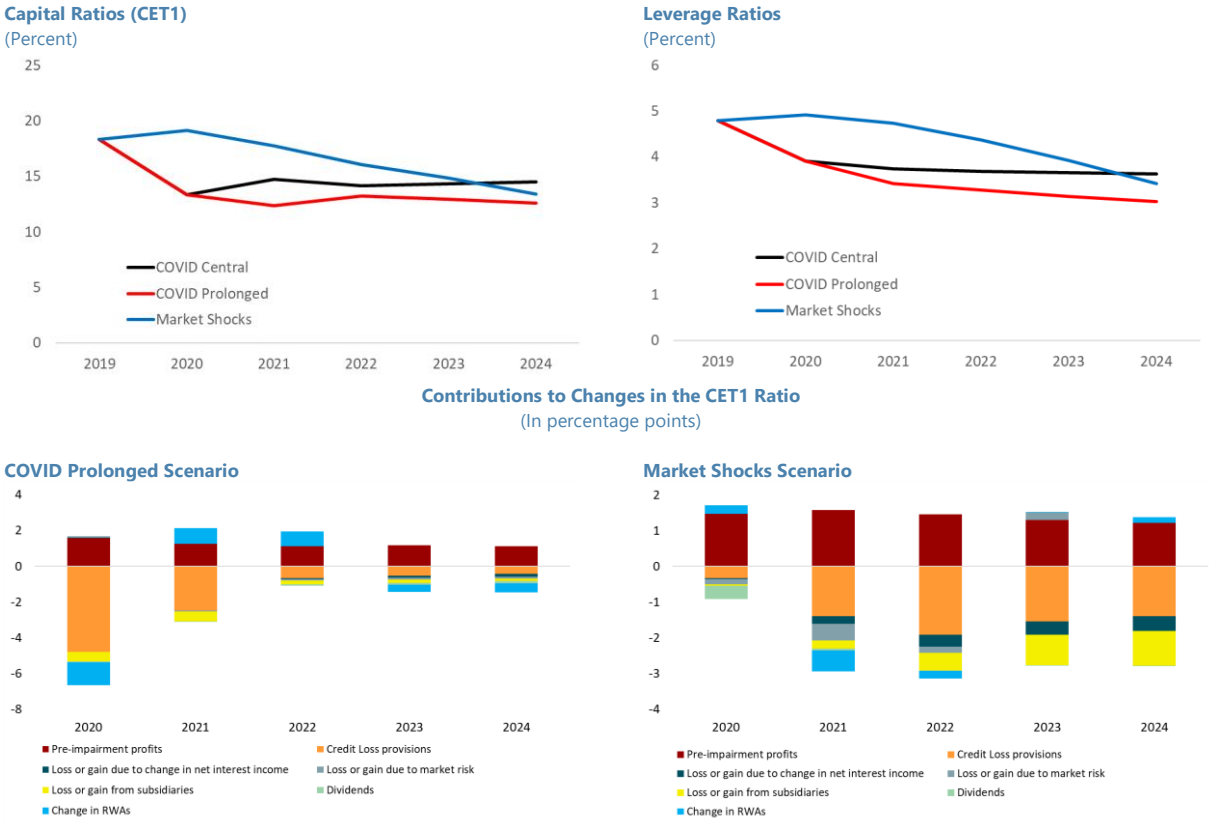
Macroeconomic Scenarios
(Percent, unless otherwise indicated)

		Stress Period				
	2019	2020	2021	2022	2023	2024
Real GDP growth						
COVID Central	1.7	-8.0	6.0	3.5	2.0	1.8
COVID Prolonged	1.7	-8.0	-2.1	3.3	3.3	3.3
Market Shocks	1.7	-1.4	-3.6	-1.0	1.1	1.3
Harmonized unemployment rate						
COVID Central	5.0	6.8	6.2	5.7	5.6	5.6
COVID Prolonged	5.0	6.8	10.4	11.8	11.0	10.0
Market Shocks	5.0	6.2	8.6	10.2	10.5	10.1
Consumer price inflation rate (based on CPI year average)						
COVID Central	1.3	0.6	0.9	1.2	1.4	1.5
COVID Prolonged	1.3	0.6	0.9	1.2	1.4	1.5
Market Shocks	1.3	-0.7	-0.9	-0.2	2.1	2.2
Nominal policy interest rate						
All Scenarios	-0.8	-0.9	-0.9	-0.8	-0.6	-0.5
Short term interbank nominal interest rate (3 month)						
All Scenarios	-0.8	1.7	2.3	2.6	1.4	0.3
Bank overall funding cost rate (shocks)[1/]						
Both COVID Scenarios		0.1	0.0	0.0	0.0	0.0
Market Shocks		0.6	0.9	1.0	0.8	0.4
Long term nominal interest rate (10 year sovereign bond yield)						
Both COVID Scenarios	-0.3	-0.6	-0.4	-0.1	0.2	0.6
Market Shocks	-0.3	-0.1	0.8	1.3	1.0	1.1
Nominal exchange rate change (DK/EUR; + is DK depreciation, in percent)						
All Scenarios	0.0	0.0	0.0	0.0	0.0	0.0
Housing prices (2019=100)						
Both COVID Scenarios	100.0	101.5	103.3	105.4	107.5	109.7
Market Shocks	100.0	91.2	82.4	77.5	79.1	80.6
Nominal growth of assets in the banking sector (for stress tests)[2/]						
COVID Central	3.5	0.0	6.9	4.9	3.7	3.6
COVID Prolonged	3.5	0.0	0.0	4.7	5.0	5.0
Market Shocks	3.5	0.0	0.0	0.0	3.6	3.9

Sources: IMF staff calculations
Note: Rate reflects overall cost of funding—calculated as a weighted average of retail and wholesale sources across all maturities. These scenarios are not meant to be forecasts and are associated with considerable uncertainty and downside risks.

Figure 19. Denmark: Solvency Stress Tests for Banking Groups

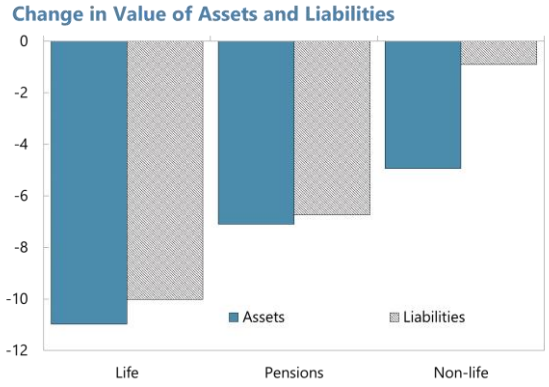
Stress tests indicate that the COVID-19 shock would have a large impact on SIFIs' capitalization ratios.



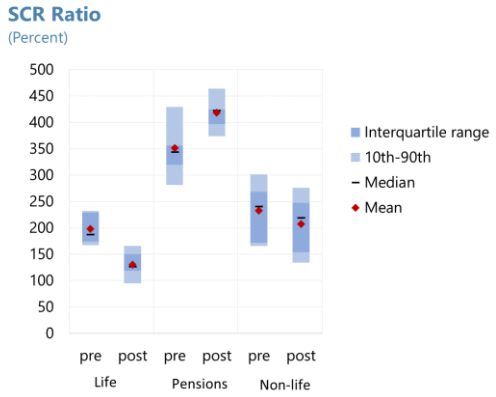
Source: IMF staff calculations.

Figure 20. Denmark: Pre-COVID Insurance Stress Test Results

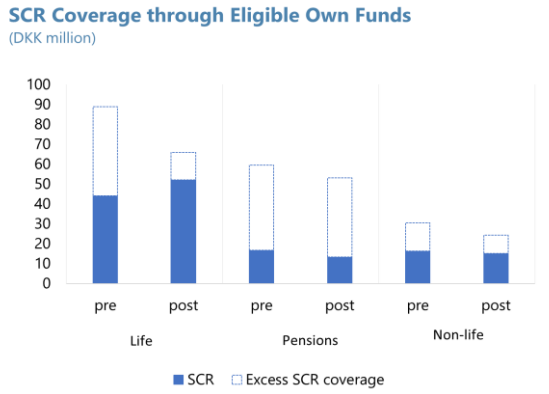
The impact of stress on asset prices is largely offset by lower liabilities, at least for life and pension companies which benefit from higher discount rates.



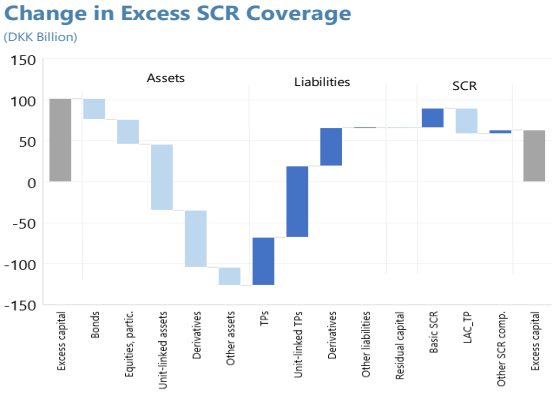
Solvency ratios decline significantly in the life sector, but less so for the non-life sector.



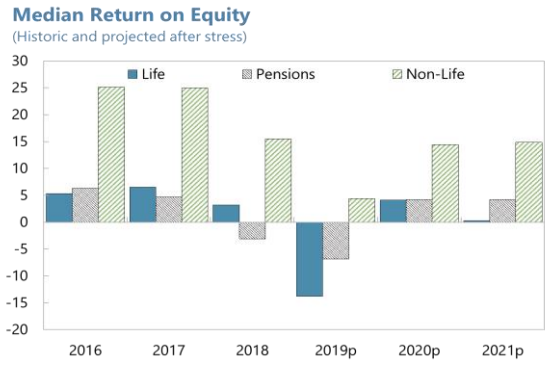
Life companies would see their SCR increase in the stress scenario, adding to a lower SCR coverage.



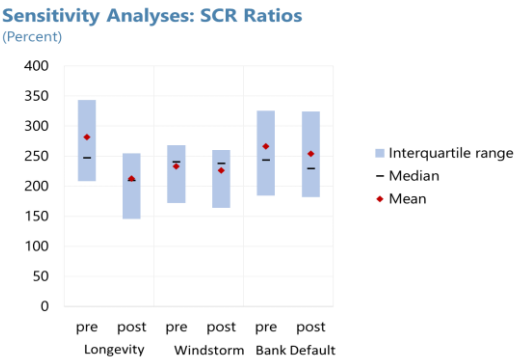
The increase in the SCR stems from a reduced loss-absorbing capacity of technical provisions.



Profitability would be severely impacted in the first year after stress, but partly recover, mainly in the non-life sector.

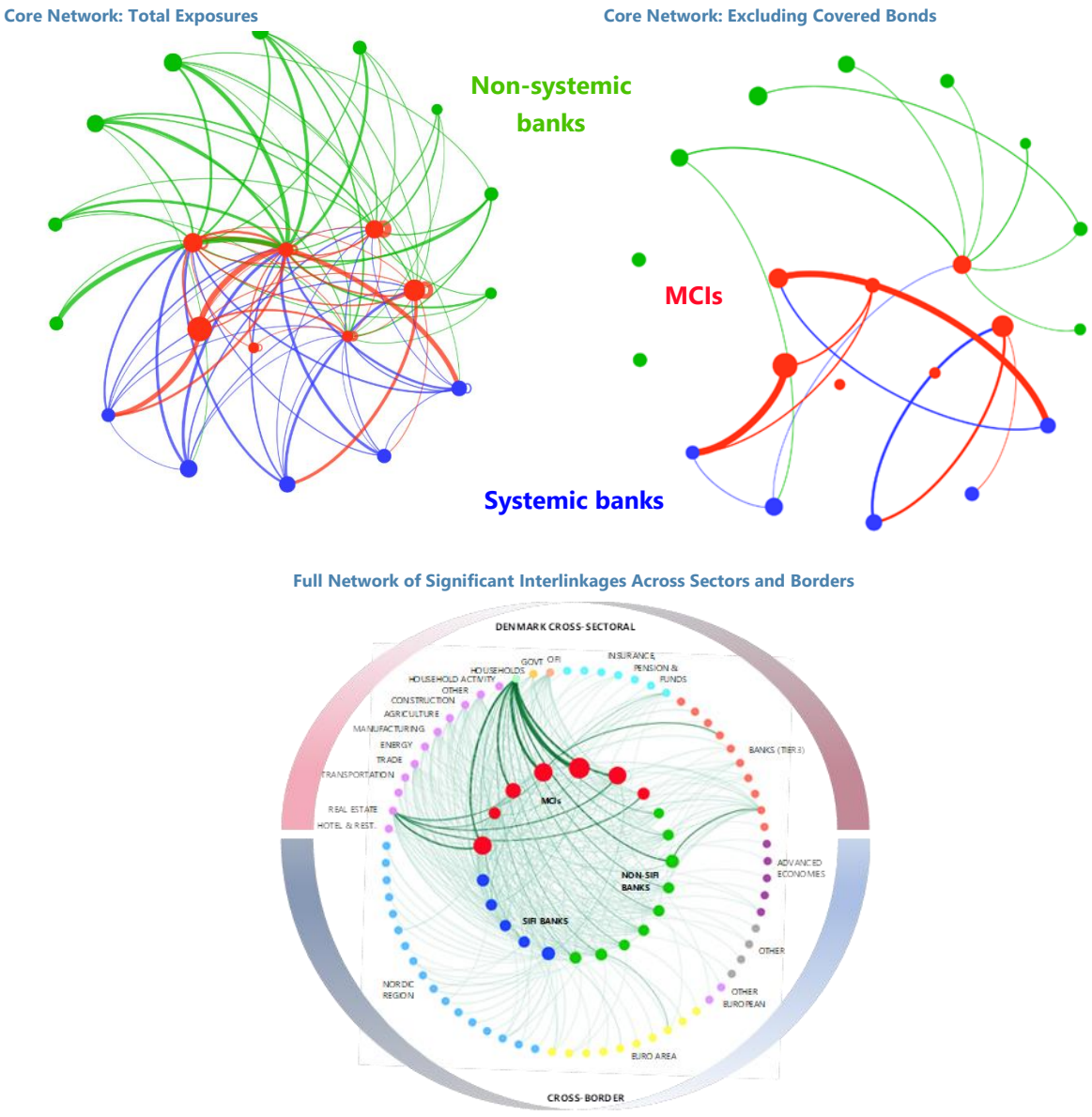


The longevity shock has a major negative impact on SCR ratios, while a severe windstorm and the default of the largest banking counterparty have smaller effects.



Sources: IMF staff calculations based on company submissions.
Note: In panel 4, TPs denote technical provisions, and LAC_TP the loss-absorbing capacity of technical provisions. Sensitivity analyses covered only the relevant sectors, i.e. longevity in the life and pension sectors, windstorm in the non-life sector, and the banking counterparty default in all sectors.

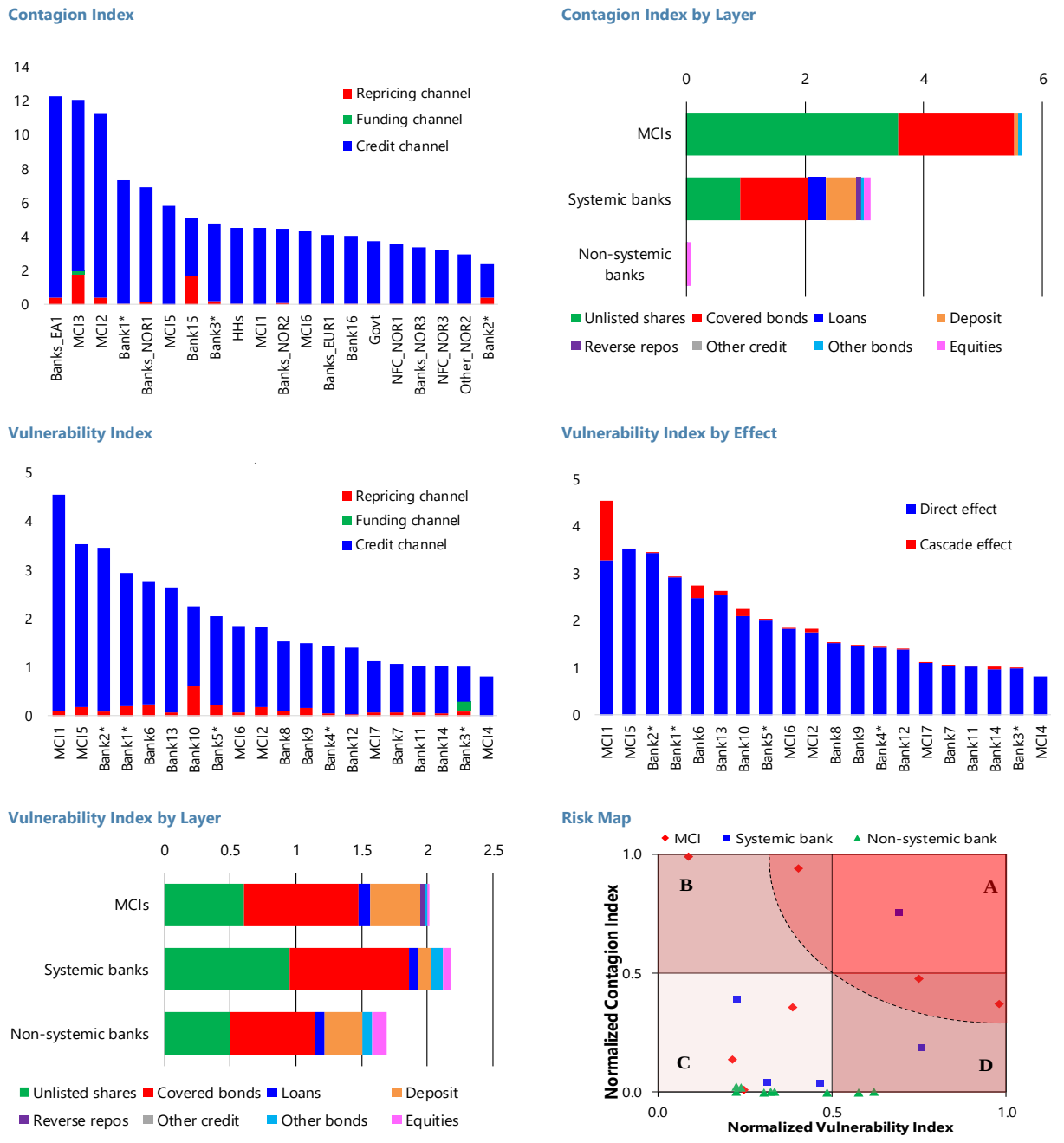
Figure 21. Denmark: Topology of the Financial System



Sources: IMF and Danmarks Nationalbank staff.

Notes: Based on September 2019 data. The network graphs in the top panel comprises 21 credit institutions, classified as systemic banks and non-systemic banks as well as mortgage credit institutions (MCIs). The bottom panel includes other individual financial institutions in Denmark and sector-level aggregates of non-financial sectors in Denmark and sector-level aggregates for cross-border exposures. Line thickness is proportional to exposure-to-capital ratio, and in the top panel matches the color of the exposed entity. Node size is proportional to weighted out degree (number of exposures weighted by exposure-to-capital ratio). In other words, thicker lines indicate higher degree of concentration vis-à-vis a counterparty normalized by exposed entity's capital and larger nodes indicate higher degree of potential vulnerability as measured jointly by the total number of exposures for each node and the strength of those connections. Exposures that are less than 10 and 5 percent of exposed entity's capital are excluded in top panel and bottom panel, respectively.

Figure 22. Denmark: Contagion Analysis Results



Sources: IMF and Danmarks Nationalbank staff

Notes: Based on September 2019 data. Banks with * indicate systemic banks; NOR represents Nordic Region countries. Contagion index (CI) is the average losses to the core network comprising 21 credit institutions normalized by their capital. For example, the hypothetical default of the most contagious entity, MCI1, results in the average losses to the other 20 entities of around 12 percent of their capital. The most vulnerable bank as measured by Vulnerability Index (VI), also MC1, incurs average losses of about 4.5 percent of its capital across all independent simulations, following the hypothetical default of each core entity in the network. Systemic Risk Map plots the normalized CI and VI (between 0 and 1) of each entity indicating where the tipping points might be in the network. For example, all the entities in the dark-shaded quadrant are relatively both more contagious and more vulnerable than the rest in the network.

Table 2. Denmark: Selected Economic Indicators, 2016-2021 (As of April 2020)

	2017	2018	2019 est.	2020 proj.	2021 proj.
Supply and Demand (change in percent)					
Real GDP	2.0	2.4	2.3	-6.5	6.0
Final domestic demand	1.7	2.7	1.8	-3.2	5.2
Private consumption	1.6	2.6	1.9	-6.0	8.5
Public consumption	1.0	0.4	0.6	10.0	-7.0
Gross fixed investment	3.0	5.4	2.9	-12.0	15.0
Net exports 1/	0.5	-0.4	1.0	-2.5	1.2
Gross national saving (percent of GDP)	29.6	30.0	30.5	25.5	27.6
Gross domestic investment (percent of GDP)	21.8	23.0	22.7	20.7	22.3
Potential output	1.9	1.9	1.9	1.5	1.5
Output gap (percent of potential output)	1.1	1.7	2.0	-6.0	-1.9
Labor Market (change in percent) 2/					
Labor force	0.7	1.1	1.1	0.7	0.8
Employment	0.9	1.9	1.1	-0.8	1.3
Harmonized unemployment rate (percent)	5.8	5.1	5.1	6.5	6.0
Prices and Costs (change in percent)					
GDP deflator	1.1	0.8	1.0	1.0	1.4
CPI (year average)	1.1	0.7	0.7	0.7	1.2
Public Finance (percent of GDP) 3/					
Total revenues	52.8	51.4	53.7	49.2	51.3
Total expenditures	51.2	50.9	51.2	56.2	51.6
Overall balance	1.5	0.5	2.5	-7.0	-0.3
Primary balance 4/	1.7	0.4	2.3	-7.4	-0.6
Cyclically-adjusted balance (percent of potential GDP)	0.4	-1.2	0.5	0.2	0.7
Structural balance (percent of potential GDP) 5/	0.0	-0.5	-0.5	-3.1	-0.3
Gross debt	35.5	33.9	30.4	39.2	39.9
Money and Interest Rates (percent)					
Domestic credit growth (end of year)	1.5	3.5	4.3	...	...
M3 growth (end of year)	3.0	-2.9	3.1	...	...
Short-term interbank interest rate (3 month)	-0.3	-0.3	-0.4	...	...
Government bond yield (10 year)	0.5	0.4	-0.2	...	...
Balance of Payments (percent of GDP)					
Exports of goods & services	55.1	55.6	55.9	49.8	53.8
Imports of goods & services	48.1	49.6	49.2	45.6	48.9
Trade balance, goods and services	7.0	6.0	6.7	4.2	4.8
Oil trade balance	-0.2	-0.4	-0.5	-0.4	-0.5
Current account	7.8	7.0	7.9	4.9	5.4
International reserves, changes	0.8	-0.3	-0.9	...	...
Exchange Rate					
Average DKK per US$ rate	6.6	6.3	6.7	...	...
Nominal effective rate (2010=100, ULC based)	98.5	100.1	99.4	...	...
Real effective rate (2010=100, ULC based)	94.9	95.5	92.8	...	...
Memorandum Items					
Nominal GDP (Bln DKK)	2175	2246	2319	2190	2355
GDP (Bln USD)	329	356	348	...	...
GDP per capita (USD)	57302	61523	59881	...	...

Sources: Danmarks Nationalbank, Eurostat, IMF *World Economic Outlook,* Statistics Denmark, and Fund staff calculations.

1/ Contribution to GDP growth.
2/ Based on Eurostat definition.
3/ General government.
4/ Overall balance net of interest.
5/ Cyclically-adjusted balance net of temporary fluctuations in some revenues (e.g., North Sea revenue, pension yield tax revenue) and one-offs.

Table 3. Denmark: FSAP Update: Status of Main Recommendations

The authorities have made progress in implementing the recommendations of the 2014 FSAP. Three groups of measures are worth highlighting in part because they involve several of the recommendations below: (1) The DFSA has introduced guidance in the form of a "Supervisory Diamond for mortgage credit institutions (MCIs)", which consists of five benchmarks to limit MCI risk taking; (2) The DFSA also issued a separate guidelines of "Seven Best Practices" for banks and MCIs to ensure more prudent mortgage lending practices in areas with large price increases (e.g., Copenhagen and Aarhus); and (3) following the recommendations by the Systemic Risk Council, the "Good Practices for Mortgage Lending" were introduced to limit the extension of riskier mortgage to highly leveraged households. An internal audit office has also been established in the DFSA. In addition, the implementation of the Solvency II Directive (which harmonized EU insurance regulation) has led to higher compliance with international standards in the fields of capital adequacy, enterprise risk management, governance, and group supervision.

Recommendations and Authority Responsible for Implementation	Priority[1/]	Status
Mortgage finance		
Reduce refinancing risk by putting into place regulatory policies to encourage longer bond maturities.	Short term	**In progress** One of the benchmarks from the Supervisory Diamond for MCIs introduces a limit on short term funding and will enter into force from 2020: The share of lending that is refinanced should be less than 12.5 percent of total lending per quarter and lower than 25 percent of total lending per year.
Limit impact of the eventual normalization of interest rates by ensuring that the credit risk is adequately taken into account in loan pricing and approvals.	Short term	**Mostly done** One of the benchmarks from the Supervisory Diamond for MCIs limits the share of loans where the LTV exceeds 75 percent of the lending limit for MCIs and where interest rate is fixed for less than two years to less than 25 percent of the total loan portfolio. Further, two of the seven best practices for banks and MCIs address the eventual normalization of interest rates. First, when granting adjustable rate loans for housing, banks must assess clients' payment ability under a scenario of higher interest rates. Second, when granting loans for buying shares in cooperative housing associations, banks should stress test the relevant association's debt under a scenario of higher interest rates.
Increase buffers in loans with interest-only (IO) periods by lowering LTV caps for such loans, requiring amortization to a lower ceiling, and/or by imposing higher capital charges or credit loss provisions until IO periods expire.	Short term	**In progress** One of the benchmarks from the Supervisory Diamond for MCIs, entering into force from 2020, caps the share of IO lending (no amortization) in the LTV band above 75 percent of the lending limit for MCIs at 10 percent of total lending.
Prudential supervision		
Reduce the length of examination cycles for banks and insurance companies, which will require additional supervisory resources.	Short term	**Done** The DFSA has been granted additional resources to increase the number of on-site inspections of banks and insurance companies: • The examination cycles for the 18 smallest and least risky banks will be shortened from a maximum interval of six years to a maximum of five years, with the annual cycles for systemically important institutions unchanged. • For insurance companies, the examination cycles will be reduced from a maximum interval of six years to a maximum of five years, except for the largest eight companies for which cycles will be reduced to a maximum of two years.

Table 3. Denmark: FSAP Update: Status of Main Recommendations (continued)		
Ensure operational independence of the DFSA by establishing a set of supervisory imperatives wholly within the authority of the Director General and by lengthening the terms of the Board members and establishing a formal vetting process.	Medium term	**Not done** No progress.
Bank supervision		
Broaden reporting of information on operational and market risk.	Short term	**Done** The DFSA has compiled new reporting templates for market risk and operational risk, which will complement existing routine reporting.
Ensure systematic review of Pillar III disclosures.	Medium term	**Done** Starting in 2016, the DFSA has introduced an obligation for supervisors to review the banks' Pillar III disclosures annually.
Insurance supervision		
Enhance the supervision of conduct of business, fraud, and AML/CFT.	Short term	**Mostly done** Conduct supervision focuses increasingly on relevant risks such as the rise of market-return products and benefits from new powers introduced by EU legislation–however resources in this area are still scarce. A report, published by the public prosecutor in 2015 and compiled together with the DFSA and the Danish Insurance Association, assesses the risk of money laundering in life insurance companies and pension funds as low—accordingly supervisory activities have been only marginal so far. The DFSA still considers the prevention of insurance fraud not to be a supervisory task.
Establish a solvency level below which companies may not operate.	Short term	**Done** The Financial Business Act has been amended, effective January 1, 2016, such that the largest Danish insurance companies must meet the new Solvency II capital levels.
Require risk, compliance, internal audit, and actuarial functions in all insurers and better integrate qualitative assessments of governance and management with off-site analysis.	Medium term	**Mostly done** Governance and internal control functions were strengthened with the implementation of the Solvency II Directive. However, small companies not subject to Solvency II, still lack an equivalent framework. The integration of qualitative assessments of governance and internal control functions into the risk assessment is still nascent.
Macroprudential policy		
Develop new instruments capable of addressing time-varying systemic risk, such as limits on loan-to-value (LTV) and debt service to income (DSTI) ratios.	Short term	**Done** DFSA has launched several measures including (1) a 5 percent down payment requirement for housing purchases; (2) new benchmarks for interest rate risk and the share of IO lending in the LTV band above 75 percent of the lending limit for MCIs as part of the Supervisory Diamond for MCIs; (3) stress tests to assess payment capacity under the assumption of interest rate hikes, potential price corrections, or decreasing sales activities in the housing market during the credit granting process as part of the Seven Best Practices, and, more recently, (4), limitations on variable-rate and deferred amortization mortgages for households with LTIs greater than four and LTVs greater than 60 percent as part of the Good Business Practice for Mortgage Lending.
Expand the range of analytical tools used to identify and monitor systemic risk.	Medium term	**Mostly done** The DN has developed several new tools for identifying and monitoring of systemic risks, which are published in its Financial Stability Reports. The Systemic Risk Council has also developed composite indicators to monitor the build-up of systemic risk from different angles in six monitoring areas.

Table 3. Denmark: FSAP Update: Status of Main Recommendations (concluded)		
Crisis management and bank resolution		
Establish early resolution triggers and strengthen funding arrangements and the resolution toolkit.	Short term	**Done** The transposition of the Bank Recovery and Resolution Directive (BRRD) into Danish Law and adoption of special legislation for mortgage banks in June 2015 established early resolution triggers, enhanced the resolution toolkit and started an ex-ante financed resolution fund managed by the FSC, the resolution authority together with DFSA.
Prepare resolution plans and resolvability assessments.	Short term	**Done** Resolution plans and resolvability assessments have been in place since end-2016. Authorities are in the process of enhancing existing plans by working on identified priority areas.
Enhance the deposit guarantee scheme by removing mandatory offsetting, strengthening back-stop arrangements, and introducing depositor preference.	Medium term	**Done** In 2015, the DGS has been moved into the FSC and enjoys now sufficient government back-up funding through the FSC, The fund currently exceeds its target level of 0.8 percent of covered deposits. With the implementation of the BRRD in June 2015, depositor preference has been introduced in Denmark. Offsetting is still applied in line with EU Directive on DGS, but does not negatively affect the speed of payout.
Stress testing		
Further exploit synergies between micro- and macroprudential stress testing via intensified cooperation.	Medium term	**Mostly done** The DFSA and DN have an ongoing dialogue on stress testing, including a dialogue on top-down stress testing methods for SIFI banks and MCIs. DN and DFSA also collaborate on the scenarios for stress testing purposes.
Develop a macroprudential stress test framework for the insurance sector.	Medium term	**In progress** The DFSA participates in the biannual EIOPA stress tests, and the DN is developing a stress testing framework for the insurance company and pension fund sector.
Expand financial stability analyses to include insurance and pension funds.	Medium term	**In progress** Initial analysis conducted by DN (most recently on liquidity risks from derivative positions) and to a limited degree also by the SRC (2016). As noted above, the DN is developing a stress testing framework for the insurance company and pension fund sector.

Table 4. Denmark: Structure of the Financial System

	2001	2010	2014	2018	2001	2010	2014	2018	2001	2010	2014	2018	2001	2010	2014	2018
Financial institutions	(Number)				(Billions of DKK)				(Percent of GDP)				(Percent of total)			
Total	616	511	390	373	5,016	11,700	13,561	14,159	365.7	646.1	684.5	630.4	100.0	100.0	100.0	100.0
Banks	194	131	91	77	3,606	7,527	7,767	7,770	262.9	415.6	392.0	346.0	71.9	64.3	57.3	54.9
Commercial banks	186	123	84	70	1,989	4,288	4,049	3,805	145.0	236.8	204.4	169.4	39.7	36.6	29.9	26.9
Mortgage banks	8	8	7	7	1,617	3,239	3,718	3,965	117.9	178.9	187.7	176.5	32.2	27.7	27.4	28.0
Insurance companies and pension funds	270	186	132	112	1,069	2,872	3,801	4,274	77.9	158.6	191.9	190.3	21.3	24.5	28.0	30.2
Insurance companies	189	128	94	78	757	1,520	2,219	2,539	55.2	83.9	112.0	113.0	15.1	13.0	16.4	17.9
Life insurance companies	58	31	19	17	650	1,351	2,013	2,344	47.4	74.6	101.6	104.4	13.0	11.5	14.8	16.6
Non-life insurance companies	131	97	75	61	107	169	206	195	7.8	9.3	10.4	8.7	2.1	1.4	1.5	1.4
Pensions funds	81	58	38	34	312	1,352	1,582	1,735	22.7	74.7	79.9	77.3	6.2	11.6	11.7	12.3
ATP	0	4	3	3	-	823	877	950	0.0	45.4	44.3	42.3	0.0	7.0	6.5	6.7
Non-occupational pension funds	31	24	16	14	272	478	646	726	19.8	26.4	32.6	32.3	5.4	4.1	4.8	5.1
Company pension funds	50	30	19	17	40	51	59	59	2.9	2.8	3.0	2.6	0.8	0.4	0.4	0.4
Other financial institutions	151	193	166	183	283	1,217	1,924	2,053	20.6	67.2	97.1	91.4	5.6	10.4	14.2	14.5
Investment funds	121	134	111	123	282	1,214	1,920	2,046	20.6	67.0	96.9	91.1	5.6	10.4	14.2	14.5
Memorandum items																
Nominal GDP					1,372	1,811	1,981	2,246								

Source: Statistics Denmark, Danish Financial Supervisory Authority.

Note: ATP is a compulsory pension scheme for employees; related schemes also included in this group.

Table 5. Denmark: Structure of the Systemically Important Financial Institutions—A Summary

	Bank or Mortgage Credit Institution (MCI)	Assets (Billions of DKK)	Asset Share (Percent)
Group	Danske Bank	3,199	49
Bank	Danske Bank A/S *(parent company)*	2,293	
MCI	Realkredit Danmark A/S *(subsidiary of Danske Bank A/S)*	867	
Group	Nykredit Realkredit	1,488	23
MCI	Nykredit Realkredit A/S *(parent company)*	1,343	
Bank	Nykredit Bank A/S *(subsidiary of Nykredit Realkredit A/S)*	178	
MCI	Totalkredit A/S *(subsidiary mortgage bank of Nykredit)*	737	
Group	Jyske Bank	627	10
Bank	Jyske Bank A/S *(parent company)*	297	
MCI	Jyske Realkredit A/S *(subsidiary of Jyske Bank A/S)*	363	
Group	Nordea Bank (Non-Danish Group)	-	13
Bank	Nordea Bank Danmark A/S *(Danish branch)*	436	
MCI	Nordea Kredit A/S *(subsidiary of Nordea Bank)*	447	
MCI	DLR Kredit A/S	161	2
Bank	Sydbank A/S	140	2
Bank	Spar Nord Bank A/S	83	1

Source: Danish Financial Supervisory Authority.

Note: Total assets reported are for 2018. Nordea Bank Group is headquartered in Finland. Total Assets for Nykredit RealKredit A/S include those of Totalkredit A/S.

Table 6. Denmark: Financial Soundness Indicators, 2012-2019

	2012	2013	2014	2015	2016	2017	2018	2019
			(Percent)					
Core FSIs								
Regulatory Capital to Risk-Weighted Assets	18.9	19.2	18.2	19.8	20.8	22.1	21.7	22.5
Regulatory Tier 1 Capital to Risk-Weighted Assets	22.1	17.3	16.3	17.7	18.4	19.7	19.8	20.0
Non-performing Loans Net of Provisions to Capital	32.1	33.6	32.8	25.9	21.9	14.1	19.6	15.7
Non-performing Loans to Total Gross Loans	6.0	4.6	4.4	3.7	3.2	2.3	1.7	1.7
Return on Assets	0.1	0.1	-0.1	0.5	0.7	0.8	0.6	0.5
Return on Equity	1.5	1.1	-1.6	9.0	12.5	14.1	10.2	9.3
Interest Margin to Gross Income	72.9	74.1	73.4	61.5	56.6	52.7	54.4	50.0
Non-interest Expenses to Gross Income	106.6	98.7	113.0	65.5	58.2	56.1	62.8	64.8
Liquid Assets to Total Assets	19.1	13.3	12.7	11.5	12.3	12.4	12.9	13.9
Liquid Assets to Short Term Liabilities	82.6	56.8	55.1	47.4	49.1	46.9	50.1	54.2
Net Open Position in FX to Capital	-20.4	-9.5	-9.0	-3.9	-8.4	-9.5	-19.6	-10.9
Sectoral Distribution of Loans								
Domestic Residents	84.0	82.2	83.6	83.3	81.6	80.1	83.6	83.4
Deposit-takers	15.7	15.2	16.3	14.2	14.3	14.6	14.9	17.3
Central bank	2.0	1.1	0.5	0.9	0.5	0.6	0.7	0.6
Other financial corporations	3.9	4.8	4.5	5.0	4.4	4.1	5.2	6.0
General government	1.1	1.0	1.1	1.2	1.0	1.0	1.1	1.0
Nonfinancial corporations	17.7	18.1	18.7	19.0	19.0	18.7	19.8	19.1
Other domestic sectors	43.7	42.0	42.5	43.1	42.3	41.1	42.1	39.4
Nonresidents	16.0	17.8	16.4	16.7	18.4	19.9	16.4	16.6
Additional FSIs								
Capital to Assets	5.3	7.0	7.3	7.8	7.4	6.9	7.0	7.3
Large Exposures to Capital	31.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0
Gross Asset Position in Derivatives to Capital	134.2	67.7	98.2	82.5	86.8	69.0	64.1	115.1
Gross Liability Position in Derivatives to Capital	128.1	63.9	95.4	81.1	87.0	67.7	62.8	115.4
Trading Income to Total Income	8.3	7.1	-15.1	0.5	5.8	11.2	5.6	7.1
Customer Deposits to Total Non-interbank Loans	31.2	29.0	30.0	31.0	31.9	32.9	32.8	32.5
FX Loans to Total Loans	21.3	21.2	18.2	17.9	17.1	22.6	20.1	19.2
Liabilities to Total Liabilities	22.7	23.4	22.0	21.0	22.2	22.2	19.7	18.6

Source: IMF Financial Soundness Indicators.

Table 7. Denmark: Risk Assessment Matrix (As of April 2020)

Source of Risk	Overall Level of Concern	
	Relative Likelihood	Expected Impact on Financial Stability if Risk is Realized
1. Prolonged COVID-19 outbreak	**High**	Containment measures remain in place (in some places intensify or need to be re-introduced) through early 2021. • Longer containment and uncertainties about the intensity and the duration of the outbreak reduce supply and domestic and external demand. A more protracted economic contraction in global growth would have a sustained negative impact on Danish exports, investment, and consumption. These risks could be exacerbated by a pandemic-prompted protectionist actions as Denmark is a small open economy with many sectors—including shipping—deeply integrated in global value chains. Corporate-sector losses would be accompanied by further increases in unemployment, NPLs, and loan loss impairments weighing on bank profitability, possibly aggravated by tighter credit conditions and adverse Nordic spillovers. • Deteriorating economic fundamentals and the associated decline in risk appetite could result in a second wave of financial tightening (amplified as latent fragilities are unmasked). A decline in consumption could set in motion an adverse macrofinancial feedback loop whereby weaker domestic demand and growth bring about further declines in asset prices. These second-round effects are likely to be significant given the high degree of domestic interconnectedness and household indebtedness. A protracted and correlated decline in asset prices would adversely affect the internationally exposed portfolios of ICPFs, erode household wealth, and also weigh on consumption growth. An ensuing credit crunch combined with a reduction of consumption by households facing debt servicing strains would amplify the impact of the initial shock. Additional second-round effects are likely to be significant given the high degree of Nordic financial integration and ensuing adverse macrofinancial feedback loops given the extent of domestic interlinkages and elevated household indebtedness. At the same time, international investors could retrench from the Danish covered bond market, raising funding costs and creating (re-) financing problems, especially for MCIs.

Table 7. Denmark: Risk Assessment Matrix (As of January 2020) (concluded)		
Source of Risk	**Overall Level of Concern**	
	Relative Likelihood	**Expected Impact on Financial Stability if Risk is Realized**
2. Financial shocks originating in the Nordic-Baltic region	**Medium**	Protracted bouts of market volatility, tighter regional financial conditions, or a correction in real estate markets in other Nordic countries would trigger losses for major Danish SIFIs, given their presence in those countries through large MCI subsidiaries. The effects of such shock would be amplified if, due to stress in Finland, the large branch of a Nordic SIFI deleverages by curtailing credit in Denmark. More generally, interlinkages with other Nordic and Baltic countries would amplify the effects of global trade and financial shocks on the Danish economy. Second-round effects would stem from tight regional trade ties and financial interlinkages, including cross-holdings of covered bonds. Although these adverse impacts could be partially mitigated by safe-haven flows, ongoing (regional) ML cases have increased financial system fragility. Likewise, significantly larger-than-anticipated ML-related fines levied by foreign authorities could disrupt the capacity of banking groups to conduct business as usual and a narrower scope of business would adversely affect their profitability.
4. Prolonged downturn in the domestic real estate market	**Medium**	The shock could be triggered by a reassessment of fundamentals whereby a decline in real estate prices would drag down the value of other asset classes, dampening consumption and investment (especially across leveraged households and non-diversified real estate developers), thereby increasing unemployment. The combination of valuation losses, higher NPLs and impairment losses, and credit rationing could set in motion a vicious cycle, whereby tighter financial conditions and depressed economic activity amplify the impact of the initial shock further.

Appendix I. Banking Sector Stress Testing Matrix (STeM)

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
1. Institutional Perimeter	Institutions included	• 7 systemic credit institutions: Danske Bank Group, Jyske Bank Group, Nykredit Realkredit Group, Sydbank, SparNord Bank, DLR Kredit, Nordea Kredit. • 5 commercial banks (unconsolidated): Danske Bank, Nykredit Bank, Jyske Bank, Sydbank. Spar Nord Bank. • 6 mortgage credit institutions (unconsolidated): Realkredit Danmark, Nykredit Realkredit, Totalkredit, Jyske Realkredit, DLR Kredit, Nordea Kredit.
	Market share	• The 7 largest systemic credit institutions cover approximately 77 percent of the total assets for credit institutions.
	Data source and baseline date	• Data for banks: Bank-by-bank supervisory data including (i) Credit risk-sensitive exposures including loans and guarantees aggregated at sectoral level, (ii) Market risk-sensitive exposures, including sovereign and covered bond exposures at individual security level and, (iii) interest rate sensitive assets and liabilities for conducting gap analysis. • Baseline Date: 30 September 2019
2. Channels of Risk Propagation	Approach	• Balance sheet-based approach.
	Macro-financial transmission: satellite models and methodologies	Banks: Macro-financial shocks trigger losses associated with credit and market risks, and loss of net interest income. • Credit risk: Loss calculations are based on a panel regression model for logit transformed sectoral impairment rates with annual frequency. Regressors include the lagged dependent variable, unemployment rate and its first lag, GDP growth rate and its first lag, short term interest rate and its first lag. Parameter estimates account for differences in riskiness of sectors and sectoral composition of individual bank portfolios. • Market risk: Market losses from holdings of debt instruments (sovereign and other) are calculated based on full re-valuation of each individual security incorporating the impact from hedges as well. Since security level holding data cannot be shared with the IMF, the IMF provided the shocks to the yield curves for a variety of debt instruments and the DN stress testing team performed the calculations.

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
		• Net interest income: A gap analysis is conducted based on granular data on asset/liability structure of individual banks broken into types of funding sources and time to re-pricing buckets. Tested banks were approached and asked to fill in data templates prepared by the FSAP for this purpose. The gap analysis evaluates how cost of funding shocks affect net interest income, where these shocks are partially passed onto lending rates on new loans. Cost of funding shocks are defined by liability type, so funding composition affects the overall cost of funding of individual banks--those banks that rely more on wholesale funding and funding with shorter maturities suffer larger increases in funding costs during the stress period. • Pre-impairment income for banks: Income in the absence of shocks is assumed to stay at the level observed for the last 4 quarters (2018Q4-2019Q3) with the additional feature that non-performing loans will not generate any income. MCIs: As MCIs only retain some risks, in the stress tests they are affected by the following shocks: 1) materialization of credit risk; 2) materialization of market risk leading to downward repricing of securities held in capital centers for the purpose of (over-)collateralization; 3) their net interest income is adversely impacted when the MCIs must issue junior bonds to top-up collateral in capital centers-- at a negative spread vis-a-vis sovereign bonds. • Credit risk: Loss calculations are based on a time series regression for logit transformed aggregate impairment rates. This approach enables the model to differentiate between the economic sectors and accounts for the riskiness of different sectors. However, the differentiated impact of the COVID-19 shock on specific sectors is not considered. Regressors include the lagged dependent variable, GDP growth rate and its lag, unemployment rate and its lag, short-term interest rate and its lag, inflation and its lag. • Top-up collateral needs: These are calculated as follows: when housing prices (index) decline, LTV ratios rise above the (80/60 percent limits, depending on mortgage type) and MCIs must issue bonds to buy and place sovereign securities in the capital centers--thus reducing the LTV again to the LTV thresholds. This issuance and purchase of bonds with different yields causes a decline in net interest income. • Market risk: same as banks. Credit growth: Assumed to grow with the nominal GDP growth rate, floored at 0.

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
	Stress test horizon	• Five years (2020–2024)
3. Tail shocks	Scenario analysis	• Scenario based tests assess the impact of shocks on the entire portfolio of assets, including those placed in the banking and trading books. <u>COVID central scenario</u>: • Reflects the deterioration in the economic outlook over the recent period, and envisages a sharp fall in GDP of 8 percent in 2020, followed by a rebound of 6 percent in 2021. • In this scenario, the contraction in GDP for 2020 is worse than what is projected in the IMF World-Economic-Outlook (WEO) for April. • The COVID central scenario results in a cumulative decline of real GDP relative to the September 2019 WEO projections equivalent to 1.8 standard deviations (6.1 percentage points) over two years. • Unemployment goes up to 6.8 percent in 2020 followed by a gradual recovery reaching 5.6 percent in 2023. • The materialization of credit risk (which is predominantly influenced by GDP growth and the unemployment rate) is the main driver of the losses. That said, the scenario also introduces cost of funding shocks for 2020 based on what has been observed in the markets at this juncture (30 basis points for interbank lending and riskier debt securities and 15 basis points for covered bonds and repos)—because these shocks were considerably less severe than those assumed under the "market shocks" adverse scenario, their impact is limited in the COVID scenarios. • Yield curve shocks for market risk loss calculations are broadly in line with what has happened so far in response to the COVID induced stress. <u>COVID prolonged scenario</u>: • The COVID central scenario is still subject to downside risks. • To further acknowledge these looming risks, a second scenario with a more prolonged recession is considered. Instead of a rebound in 2021, the economy continues to contract by 2.1 percent before the recovery ensues in 2022. • The COVID prolonged scenario results in a cumulative decline of real GDP relative to the September 2019 WEO projections equivalent to 4 standard deviations (13.6 percentage points) over two years.

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
		• The unemployment rate peaks at 11.8 percent in 2022. • The materialization of credit risk (which is predominantly influenced by GDP growth and the unemployment rate) is the main driver of the losses. That said, the scenario also introduces cost of funding shocks for 2020 based on what has been observed in the markets at this juncture (30 basis points for interbank lending and riskier debt securities and 15 basis points for covered bonds and repos)—because these shocks were considerably less severe than those assumed under the market shocks adverse scenario, their impact is limited in the COVID scenarios. • Yield curve shocks for market risk loss calculations are broadly in line with what has happened so far in response to the COVID induced stress. Market shocks adverse scenario: • The market shocks adverse stress scenario is triggered by a series of global and domestic shocks. It is generated using as input the IMF's Flexible System of Global Models developed and maintained by the Research Department (RES). It is driven by a combination of external and domestic shocks; the domestic effects of these shocks are amplified by existing vulnerabilities. • Escalating global trade tensions and a tightening of global financial conditions are the main drivers which depress business and consumer confidence, generating downturns in advanced and EM economies. • Abrupt decompression of risk asset premia particularly impacts the "high spread economies" in Europe and are reflected in higher money market interest rates, banks' cost of short-term funding, and long-term government bond yields. • Housing prices decline by 18 percent over three years, with an adverse impact on domestic consumption and residential investment. • Funding comes under pressure as heavy reliance on wholesale funding by Danish banks and MCIs make them vulnerable to market turmoil. Overall cost of funding increases by 100 basis points, with partial pass-through to lending rates.

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
		• The scenario assumes that the exchange rate regime remains credible despite domestic and international stress. • The adverse scenario results in a cumulative decline of real GDP relative to the October 2019 WEO projections equivalent to 2.5 standard deviations (8.6 percentage points) over two years.
	Behavioral Adjustments	• Balance sheet Assumptions: Balance sheets are assumed to be quasi-static—the rate of loan growth and funding growth are tied to nominal GDP growth. • Asset disposal and acquisition is not permitted. • External capital injections are not permitted. • Non-performing loans are not permitted to generate interest income. • Banks are assumed to make dividend pay-outs of 40 percent for periods with positive net income and no pay-outs in case of negative income. • Banks are assumed to pay the same tax rate calibrated as the average of tax rate for the five large banks during the last four quarters. Same calibration exercise is undertaken for the MCIs as well.
	Sensitivity analysis	• Sensitivity analysis evaluates the impact of shocks to single risk factors in a static manner. • Simultaneous default of 3, 5, and 10 largest single exposures with several LGD assumptions. • A significant increase to the RWAs as a result of Basel-III output floors.
4. Regulatory and Market-Based Standards and Parameters	Calibration of risk parameters	• Credit risk – Expected Losses: Based on availability of data, credit risk satellite model projects future impairment rates. Using, Frye-Jacobs LGD function, we split the impairment rate projections into Point-in-time PD and LGD parameters such that PD*LGD = Impairment rate projection. • Credit risk- RWAs: We convert the shocks to the PIT PD parameters to through-the-cycle (TTC) PD parameters for projection of RWAs. • Market risk: Yields for sovereign and corporate bonds were determined based on historical statistical relationships with the other variables available in the scenario.
	Regulatory/Accounting and Market-Based Standards	• Capital definition according to the national implementation by DFSA. Data on combined CET1, including the CCB, SIFI, pillar II and CCyB buffers are available from DFSA for 2020 Q1. • RWA behave dynamically according to changes in credit risk parameters.

Domain		Top-down (IMF FSAP team, DN, DFSA)
CREDIT INSTITUTIONS: SOLVENCY RISK		
5. Reporting Format for Results	Output presentation	• Evolution of CET1 capitalization ratios for the consolidated banking groups. • Decomposition of the reduction in CET1 capital ratio in terms of drivers (credit risk, market risk, interest rate risk).

Domain		Top-down (IMF FSAP team, DN, DFSA)
BANKING SECTOR: LIQUIDITY RISK		
1. Institutional Perimeter	Institutions included	• 5 commercial banks (unconsolidated): Danske Bank, Nykredit Bank, Jyske Bank, Sydbank. Spar Nord Bank.
	Market share	• The 5 largest banks cover approximately 84 percent of the banking system's total assets.
	Data and baseline date	• Latest data: August and September 2019. • Source: supervisory data. • Scope of consolidation: solo basis for banks.
2. Channels of Risk Propagation	Methodology	• Top-Down cash-flow-based using data on the time structure of undiscounted cash flows for up to one year, by currency. • Top-Down LCR based tests.
3. Risks and Buffers	Risks	• Funding liquidity • Market liquidity
	Buffers	• Counterbalancing capacity. • DN (standing) facilities (general framework only, excluding unconventional facilities).
4. Tail Shocks	Size of the shock	• Bank run on deposits and partial dry up of wholesale funding markets, including the covered bonds market. Haircuts are applied to liquid assets to capture the effects of fire sales on asset market prices. • Run-off rates on funding sources calibrated to trigger a severe cumulative withdrawal of overall funding amount (about 20 percent over a three-month period).
5. Regulatory and Market-Based Standards and Parameters	Regulatory standards	• Liquidity gap, survival period. • Consistent with Basel III standards (LCR).
6. Reporting Format for Results	Output presentation	• Liquidity gap by bank. • Survival period by bank, number of banks that still can meet their obligations.

Domain		Top-down (IMF FSAP team, DN, DFSA)
INTERCONNECTEDNESS AND CONTAGION ANALYSIS		
1. Institutional perimeter and methodology	Institutions	Active nodes: • Systemic banks: Danske, Jyske, Nykredit, Sydbank, Spar Nord • Non-systemic banks: Arbejdernes, Ringkjobing, Sk. Kronjylland, Sk. Sjaelland-Fyn, Lan & Spar, Vestjysk, Sk. Vendsyssel, Jutlander, Den Jyske • Mortgage credit institutions: Nykredit Realkredit, Realkredit Danmark, Totalkredit, Nordea Kredit, Jyske Realkredit, DLR Kredit, LR Realkredit Passive nodes: • Danish financial entities at individual level: 109 "Group 3" banks and branches of foreign banks, 103 life and non-life insurers, 41 pension funds; • Danish sectors at aggregate level: investment funds, other financial institutions, households, NFCs by industry • Cross-border counterparties aggregated at sector level by country: credit institutions, pension funds, insurance companies, investment funds, other financial institutions, households, NFCs, and government.
	Market share	• Active nodes account for 86 percent of the total assets of the Danish banking system.
	Data and baseline date	• Sources: Credit registry, securities database, and supervisory COREP, FINREP, and national reporting templates. • Single datapoint: September 30, 2019.

Domain		Top-down (IMF FSAP team, DN, DFSA)
INTERCONNECTEDNESS AND CONTAGION ANALYSIS		
2. Channels of Risk Propagation	Methodology	• Application of CoMap framework (Covi, Gorpe and Kok, 2019), with extensions to model multi-layer contagion through 8 different instrument types (loans, deposits, reverse repos, other claims, covered bonds, other bonds, equities and unlisted shares) and incorporate MCIs as active nodes. This extend model was a stand-alone exercise and did not provide quantitative inputs into the solvency stress tests.
	Risks/factors assessed	• Credit default channel simulates an entity defaulting on its obligations to its counterparts with losses calculated based on loss-given default (LGD) ratios calibrated at exposure level. LGD for credit exposures reflects the net exposures after protection and/or collateral values are deducted from the outstanding. For debt securities, loss-given default is calculated/updated dynamically based on distance-to-default from the current state and for equity and unlisted shares, is assumed to be 100 percent. • Funding withdrawal channel simulates how funding shortfalls can either be met by HQLA in excess of NLO or can lead to deleveraging and fire sales. Exposure-specific maturity information and detailed information on asset encumbrance are used to calibrate parameters. • Market repricing channel for securities captures market reactions to weakening capitalization of MCIs and banks through rating downgrades and market valuation losses to the holders of downgraded securities.
3. Tail Shocks	Scenario analysis	• Idiosyncratic shocks: hypothetical failure of each entity as a potential trigger event.
	Sensitivity analysis	• Sensitivity to parameter calibrations along several directions: default threshold, funding shortfall maturity buckets, rating conversion and migration, default ratio for households and NFCs.
4. Reporting Form for Results	Output presentation	• Number of cascade defaults. • Contagion losses induced (contagion index) and experienced (vulnerability index) by each node. • Decomposition of losses by layer (instrument type) and entity types.

Domain		Assumptions	
		Bottom-Up by Insurance Undertakings	Top-Down by IMF and authorities
INSURANCE SECTOR: SOLVENCY RISK			
1. Institutional perimeter	Institutions included	• 5 life insurers: AP Pension, Danica, PFA Pension, Top Liv, Velliv • 6 occupational pension funds: PenSam, PK Farmakonomer, PK Socialrådgivere, PK Sundhedsfaglige, PK Sygeplejersker, Sampension • 5 non-life insurers: AlmBrand, Codan, Lærerstandens Brandforsikring, TopDanmark, Tryg • 1 pension fund: ATP	• 5 life insurers: AP Pension, Danica, PFA Pension, Top Liv, Velliv • 6 occupational pension funds: PenSam, PK Farmakonomer, PK Socialrådgivere, PK Sundhedsfaglige, PK Sygeplejersker, Sampension • 5 non-life insurers: AlmBrand, Codan, Lærerstandens Brandforsikring, TopDanmark, Tryg
	Market share	• Life and occupational pension funds: >70 percent of total balance sheet assets • Non-life: >70 percent of total balance sheet assets	• Life and occupational pension funds: >70 percent of total balance sheet assets • Non-life: >70 percent of total balance sheet assets
	Consolidation	• Solo level	• Solo level
	Data	• Regulatory reporting	• Regulatory reporting
	Reference date	• June 30, 2019	• June 30, 2019
2. Channels of risk propagation	Methodology	• Investment assets: market value changes after price shocks, affecting the solvency position • Sensitivity analysis: effect on available capital and solvency position	• Investment assets: market value changes after price shocks, affecting the solvency position
	Time horizon	• Instantaneous shock • 3-year projection (in the scenario)	• Instantaneous shock
3. Tail shocks	Scenario analysis	• Adverse scenario: risk-free interest rates (without volatility adjustment) +/-0 bps (1y DKK), +25 bps (10y DKK); sovereign bond spread +110 bps (Denmark), +40 bps for AAA-rated euro area countries, up to +250 bps for high-yield euro area countries; stock prices -26.5 percent (domestic), -20 percent (other advanced economies), -25 percent (emerging and developing economies); property prices -22 percent (domestic residential), -26.4 percent (domestic commercial), -7.7 and -9.2 percent (other countries, residential and commercial, respectively); domestic corporate bond spreads (financials) between +100 bps (AAA) and +300 bps (B and lower); domestic covered bond spreads +80 bps (AAA); foreign corporate bond spreads (financials) between +50 bps (AAA) and +300 bps (B and lower)	• Adverse scenario: risk-free interest rates (without volatility adjustment) +/-0 bps (1y DKK), +25 bps (10y DKK); sovereign bond spread +110 bps (Denmark), +40 bps for AAA-rated euro area countries, up to +250 bps for high-yield euro area countries; stock prices -26.5 percent (domestic), -20 percent (other advanced economies), -25 percent (emerging and developing economies); property prices -22 percent (domestic residential), -26.4 percent (domestic commercial), -7.7 and -9.2 percent (other countries, residential and commercial, respectively); domestic corporate bond spreads (financials) between +100 bps (AAA) and +300 bps (B and lower); domestic covered bond spreads +80 bps (AAA); foreign corporate bond spreads (financials) between +50 bps (AAA) and +300 bps (B and lower)

Domain		Assumptions	
		Bottom-Up by Insurance Undertakings	Top-Down by IMF and authorities
	Sensitivity analysis	• Longevity shock (life and pensions only): permanent 25 percent decline in mortality rates • Mortality shock (life and pensions only): permanent 15 increase in mortality rates • Pandemic event (life and pensions only): temporary 35 percent increase in disability/morbidity rates, temporary 10 percent increase in mortality rates • Mass lapse event (life only): 20 percent lapse rate in contracts where the discontinuance of the contract results in a loss for the insurer • Catastrophic events (non-life only): repetition of Windstorm Anatol (December 1999) based on today's exposures • Default of largest banking counterparty	• Lower interest rate term structure: -100 bps parallel shift (for all currencies) • Spread shock to domestic covered bonds: +250 bps
4. Risks and buffers	Risks/factors assessed	• Market risks: interest rates, share prices, property prices, credit spreads • Underwriting risks: longevity, mortality, pandemic event, catastrophic events • Summation of risks, no diversification effects	• Market risks: interest rates, share prices, property prices, credit spreads • Credit risks: default of largest financial counterparty • Summation of risks, no diversification effects
	Buffers	• Product-specific	• Loss-absorption capacity stemming from policyholder participation
	Behavioral adjustments	• Management actions limited to non-discretionary rules in place at the reference date	• None
5. Regulatory standards and parameters	Regulatory/ accounting standards	• Solvency II • National GAAP	• Solvency II • National GAAP
6. Reporting format for results	Output presentation	• Impact on solvency ratios (including and excluding the effect of long-term guarantee measures) • Impact on net income • Contribution of individual shocks • Dispersion measures of solvency ratios and net income • Survey-based reactions and management actions of insurers after stress	• Impact on solvency ratios (including and excluding the effect of long-term guarantee measures) • Contribution of individual shocks • Dispersion measures of solvency ratios and net income