INTERNATIONAL MONETARY FUND

Vulnerabilities and Risks in Denmark's Nonbank Financial Institutions

Denmark

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SIP/2024/044

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Vulnerabilities and Risks in Denmark's Nonbank Financial Institutions
Prepared by Burcu Hacibedel and Mariusz Jarmuzek

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ABSTRACT: Denmark's nonbank financial institutions (NBFI) sector has substantially increased in size since the Global Financial Crisis (GFC), becoming an important part of the financial system. Systemic risk associated with NBFIs have been contained but warrants close monitoring, especially regarding leverage, liquidity buffers, and interconnectedness. There are important mitigating factors that reduce systemic risk stemming from NBFIs in Denmark. Strengthening of systemic risk assessment and policy framework for NBFIs is warranted and could include developing a systemic risk assessment framework covering both banks and NBFIs and an ensuing system-wide stress testing framework.

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August 22, 2024

Approved By
European Department

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CONTENTS

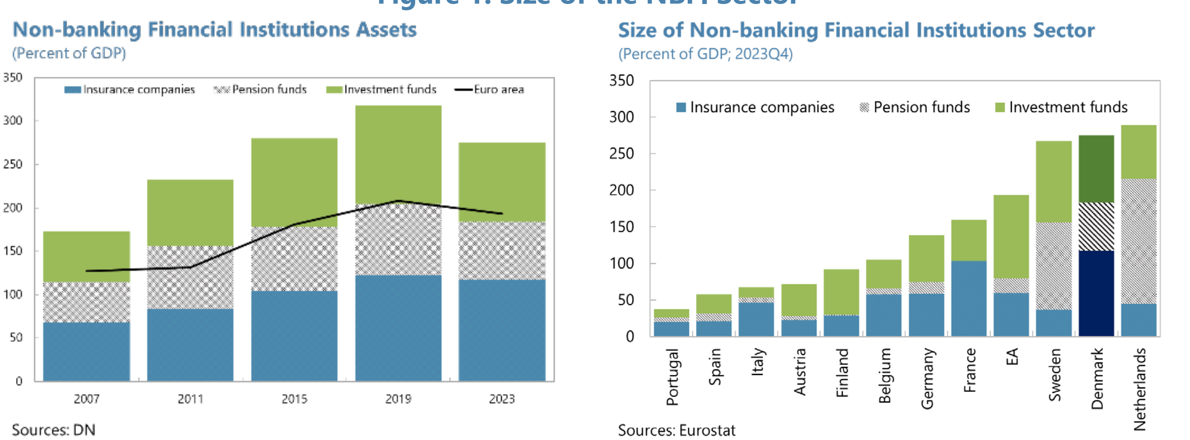
VULNERABILITIES AND RISKS IN DENMARK'S NONBANK FINANCIAL INSTITUTIONS[1]

Denmark's nonbank financial institutions (NBFI) sector has substantially increased in size since the Global Financial Crisis (GFC), becoming an important part of the financial system. Systemic risk associated with NBFIs have been contained but warrants close monitoring, especially regarding leverage, liquidity buffers, and interconnectedness. There are important mitigating factors that reduce systemic risk stemming from NBFIs in Denmark. Strengthening of systemic risk assessment and policy framework for NBFIs is warranted and could include developing a systemic risk assessment framework covering both banks and NBFIs and an ensuing system-wide stress testing framework.

A. Introduction

1. Denmark's NBFI sector has tripled in size since the GFC, becoming an important part of the financial system. The NBFI sector, which comprises insurance companies, pension funds, and investment funds, now accounts for almost 300 percent of GDP, making Denmark one of the countries with the largest NBFI sectors in the EU. The increase in size stemmed from significant gains from investment returns and valuation, increased household assets, as well as a search for yield and tighter regulations for banks (Claessens, 2024). As a result, the share of NBFIs in the total assets of the financial system increased from less than 30 percent in 2007 to almost 45 percent in 2023.

Figure 1. Size of the NBFI Sector



2. While there are benefits to the increased role of NBFIs, they may also come with vulnerabilities and risks. On the one hand, NBFIs can complement banks in supporting the real economy through improved risk-sharing, which can help reduce systemic risk (Langfield and Pagano 2016, Claessens 2017). On the other hand, the increased role of NBFIs can expose vulnerabilities associated with interconnectedness, liquidity, and leverage. Higher interconnectedness generally

[1] Prepared by Burcu Hacibedel and Mariusz Jarmuzek. The authors thank participants of the workshop held at the Danmarks Nationalbank for useful discussions and comments.

enhances the resilience of the system subject to a smaller magnitude of shocks (Allen and Gale, 2000), but contagion can become a concern with larger shocks, posing a systemic risk threat (Gai and others 2011, Acemoglu and others 2013). Liquidity challenges can arise when companies sell assets in a downturn and search for yield in an upturn, with amplification stemming from increasing liquidity exposures through margin calls on derivatives (Claessens, 2024). Leverage can act in a procyclical manner and amplify market stress. The interaction between interconnectedness, liquidity, and leverage can generate amplifying negative feedback loops and systemic stress.

3. This chapter assesses systemic risk in Denmark's NBFI sector. Key questions that are addressed include (i) What are the key vulnerabilities associated with NBFIs? (ii) How do they interact with prevalent risks? and (iii) What can be done by policymakers to address these vulnerabilities and risks? To address these questions, the study first documents the growth of the NBFI sector in Denmark and then identifies its key vulnerabilities and risks. Furthermore, the study sheds some light on policy options to address the identified vulnerabilities and risks, drawing on international experiences.

B. Vulnerabilities

4. There has been an increased focus on monitoring financial vulnerabilities in NBFIs for advanced economies. According to the FSB (2021) and the IMF (2017), financial vulnerabilities represent the accumulation of imbalances, which if interacted with shocks, may lead to systemic disruption. Reflecting financial stability risks associated with NBFIs identified in the literature, the IMF (2023) and the FSB (2023) have highlighted asset prices, leverage, liquidity, and interconnectedness as key vulnerabilities that warrant close monitoring in advanced economies. In this context, the Fed (2024) has recently emphasized the need to monitor systemic risk stemming from NBFIs, especially in terms of liquidity and interconnectedness. Finally, the ESRB (2022), the IMF (2024), and the ECB (2024) have also singled out vulnerabilities associated with commercial real estate (CRE) for NBFIs in European economies.[2]

Asset Prices

5. There are sizeable exposures to asset prices. Drawing on the FSB (2021), high exposure to debt securities and equities makes Danish NBFIs susceptible to market risk because of potential marked-to-market losses and volatility, incomplete hedging, and misalignment in collateral values. Zooming in on debt securities exposures, there has been a significant asset allocation to covered bonds issued by mortgage credit institutions (Box 1). This indirectly exposes NBFIs to fluctuations in real estate markets, although direct exposures in terms of property holdings are relatively small. Insurance companies and pension funds face exposures to investment funds, with investment funds being increasingly exposed to each other. This in turn increases their susceptibility to amplification in market volatility.

[2] Analysis of vulnerabilities is based on data sourced from sectoral accounts published by Danmarks Nationalbank and Eurostat respecting their definitions of sectors.

Figure 2. Asset Holdings

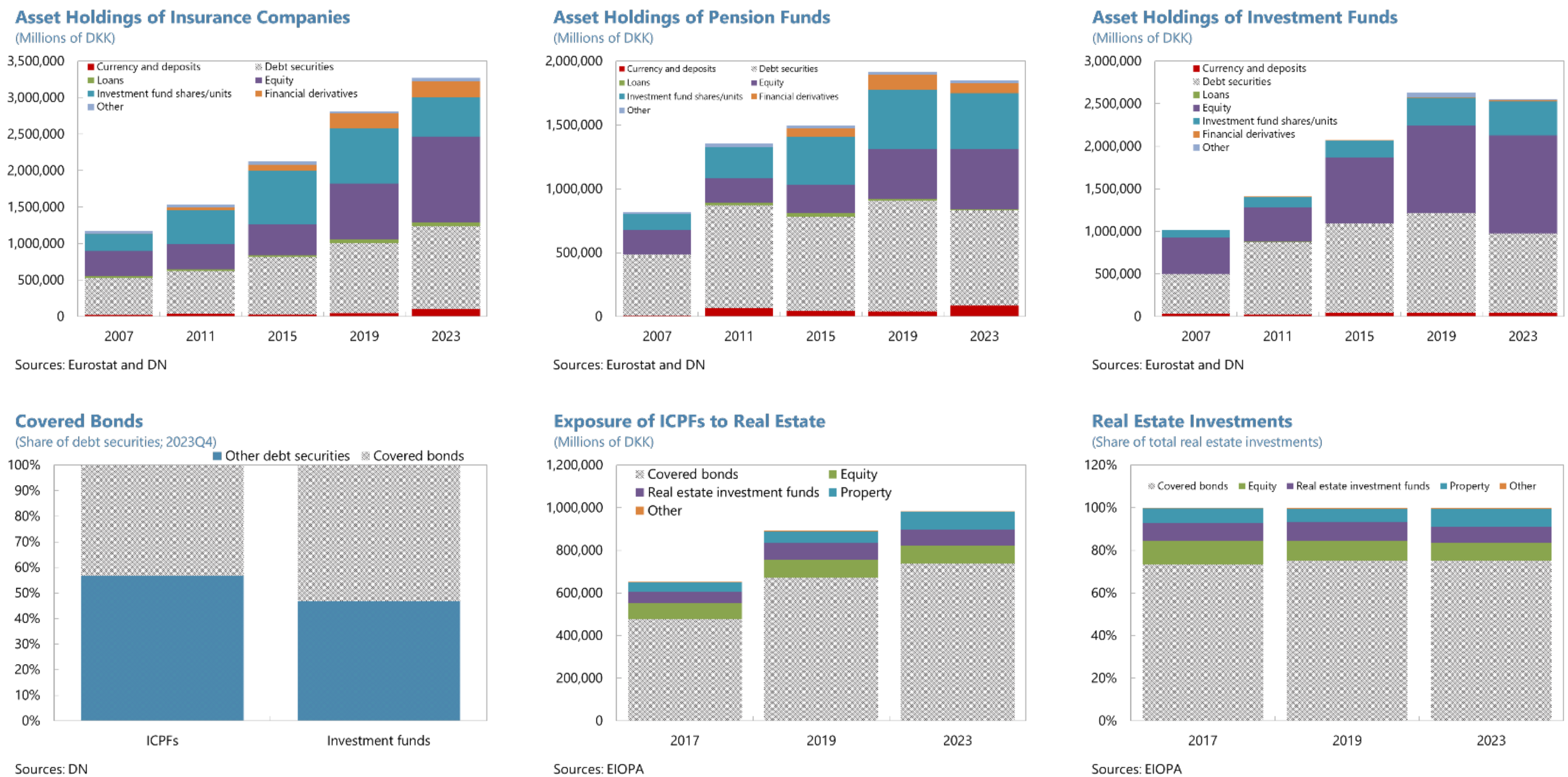
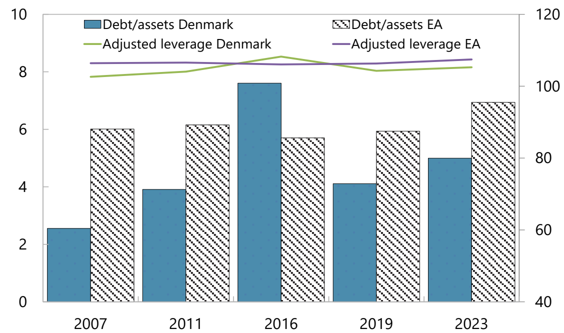


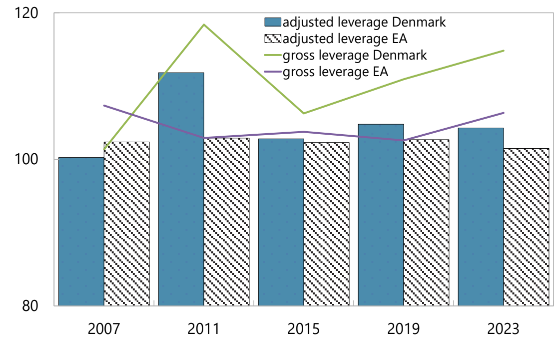
Figure 3. Leverage

Leverage of Insurance Companies
(Percent)



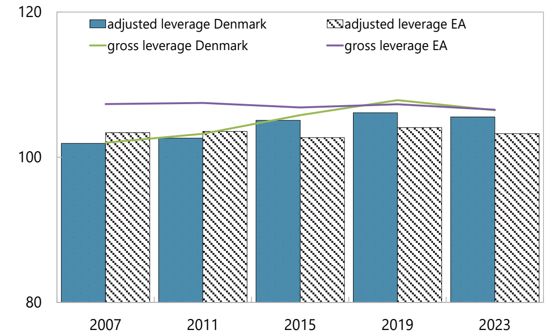
Sources: Eurostat, DN

Leverage of Pension Funds
(Percent)



Sources: Eurostat, DN

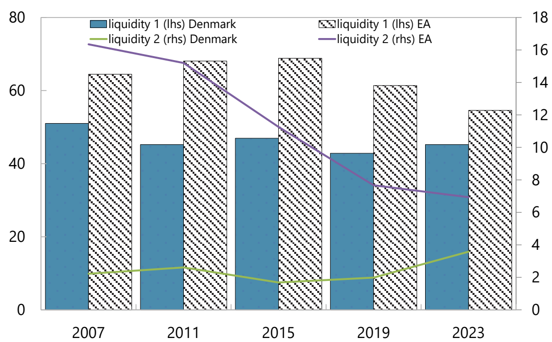
Leverage of Investment Funds
(Percent)



Sources: Eurostat, DN

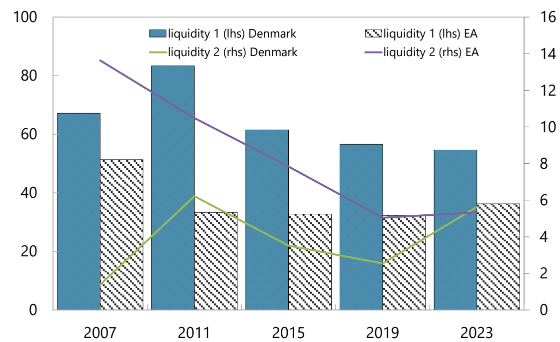
Figure 4. Liquidity

Liquidity of Insurance Companies
(Percent)



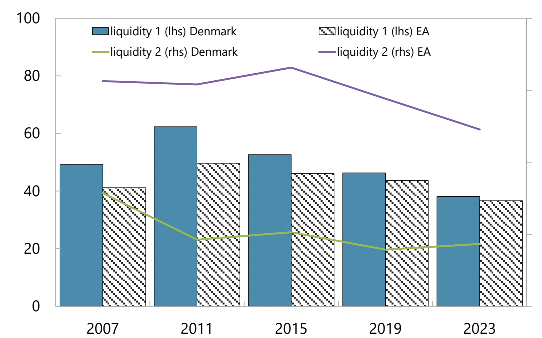
Sources: Eurostat, DN

Liquidity of Pension Funds
(Percent)



Sources: Eurostat, DN

Liquidity of Investment Funds
(Percent)



Sources: Eurostat, DN

Leverage

6. **While leverage has increased, its level does not seem to be excessive**. The concept of leverage for insurance companies and pension funds is less established compared to banks and investment funds, so there is no common definition for them (EIOPA, 2018). For insurance companies, a general measure of leverage defined as a ratio of debt to assets (IAIS, 2022) suggests an increase in leverage for Denmark since the GFC, but its level tends to be lower compared to the EA average.[3] For pension and investment funds, we employ a measure of leverage defined as a ratio of assets under management to net asset values (gross leverage), with adjusted leverage excluding derivatives (ESMA, 2024). These measures show that leverage has increased but only slightly above the EA average in these two segments.

Liquidity

7. **Liquidity buffers are sizeable if covered bonds are included as part of liquid assets**. Following the EIOPA (2018) and the ESRB (2018), liquidity buffers are proxied as a share of cash, deposits, and debt securities, including covered bonds (liquidity 1), and cash and deposits (liquidity 2) in total assets. The liquidity 1 indicator suggests that the liquidity buffer is above the EA average for pension funds and at par for investment funds. However, the liquidity buffer of insurance companies in Denmark falls short of that in the EA average. When excluding debt securities, the liquidity 2 indicator indicates that liquidity buffers are lower compared to the EA average, especially for investment funds, but converging to the EA average levels for all the segments.

Interconnectedness

8. **There is a high degree of domestic and cross-border interconnectedness**.

- Domestic interconnectedness is defined in terms of exposures of NBFI segments vis-à-vis the domestic financial sector. For insurers and pension funds in Denmark, there is a significant interdependence with investment funds, such that market pressures forcing investment funds to sell their assets could impact insurers and pension funds. The latter may need to sell their assets as well, amplifying the cycle and triggering an adverse feedback loop. In addition, Danish NBFIs are more interconnected with banks through holdings of covered bonds compared to the EA average (EIOPA, 2023), potentially making them more susceptible to real estate markets and market pressures.
- Cross-border interconnectedness is defined in terms of exposures of NBFI segments vis-à-vis the rest of the world. For insurers and investment funds, a substantial portion of their cross-border asset allocation is in equities and debt securities, exposing them to fluctuations in the global financial markets. Furthermore, there is also substantial interdependence with the rest of the world through large exposures to a few countries such as the U.S., the UK, Luxembourg, and Ireland. This raises the issue of common exposure and transmission of market shocks from abroad.

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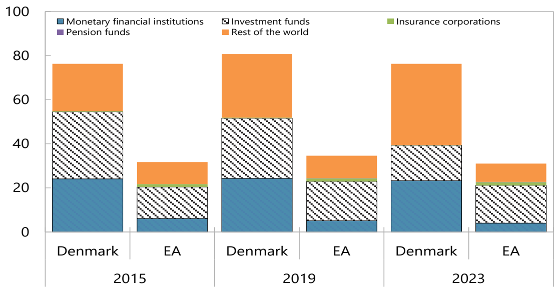
[3] EIOPA (2018) suggests additional indicators as proxies of leverage for insurance companies.

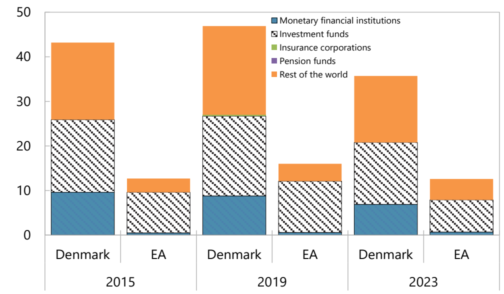
Figure 5. Interconnectedness

Interconnectedness of Insurance Companies
(Percent of GDP)



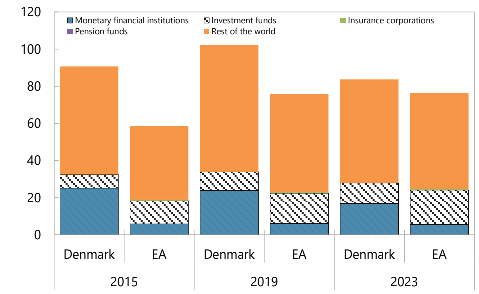
Sources: Eurostat

Interconnectedness of Pension Funds
(Percent of GDP)



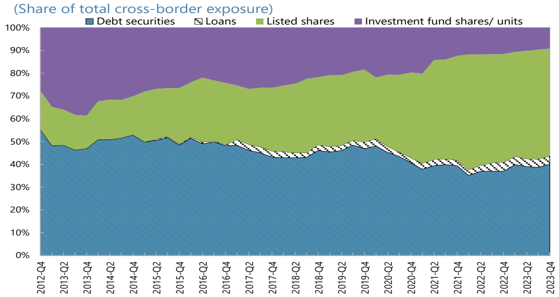
Sources: Eurostat

Interconnectedness of Investment Funds
(Percent of GDP)



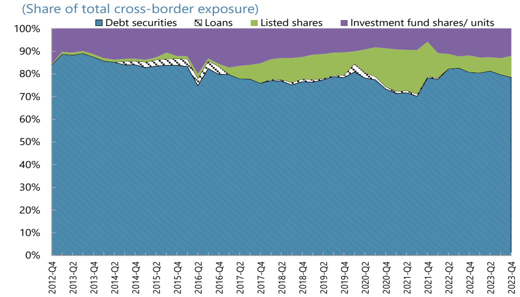
Sources: Eurostat

International Interconnectedness of Insurance Companies
(Share of total cross-border exposure)



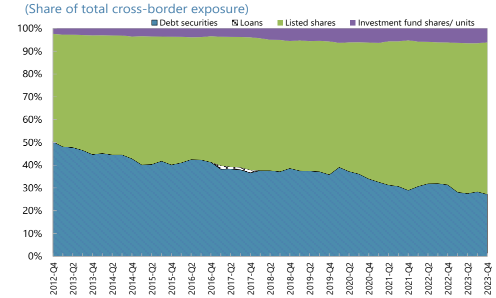
Sources: Eurostat

International Interconnectedness of Pension Funds
(Share of total cross-border exposure)



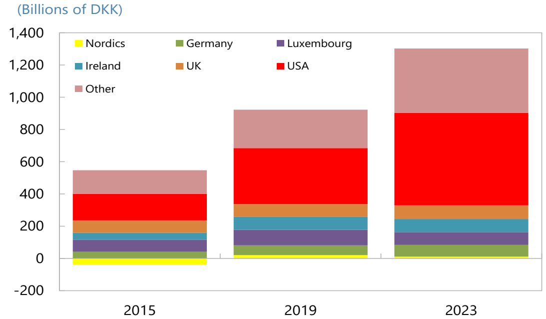
Sources: Eurostat

International Interconnectedness of Investment Funds
(Share of total cross-border exposure)



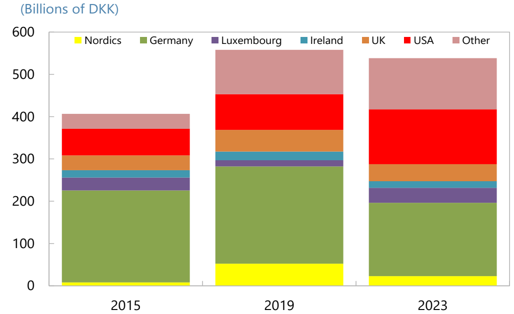
Sources: Eurostat

Cross-border Investments of Life Insurance Companies
(Billions of DKK)



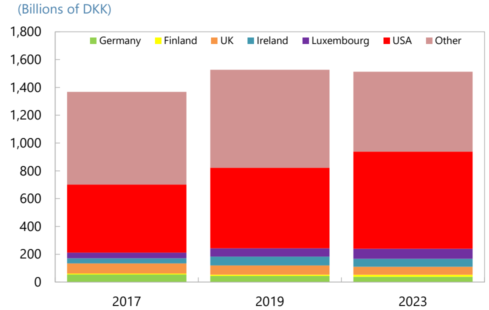
Sources: DN

Cross-border Investments of Pension Funds
(Billions of DKK)



Sources: DN

Cross-border Investments of Investment Funds
(Billions of DKK)



Sources: DN

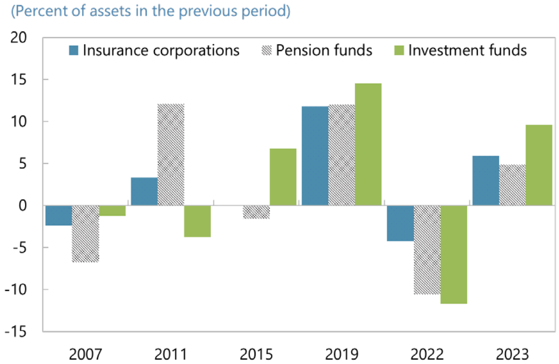
C. Risks

9. An integral element of systemic risk assessment involves identifying key risks. While vulnerabilities may increase the likelihood that a shock leads to systemic disruption in the financial system, systemic stress is unlikely to occur without the substantial materialization of a shock (FSB, 2021). The EIOPA (2024) and the ESRB (2024) have identified market and credit risks as the main risks for NBFIs in the EU countries. In addition, Denmark might also be subject to a macro-financial risk attributed to a sizeable wealth effect (IMF, 2018, see below), with the joint materialization of these risks potentially being particularly detrimental. If these risks were to materialize, they could test the resilience of the Danish financial system. Annex 1 presents a stylized illustration of interdependencies within the financial system of an advanced economy, providing insights into the role of NBFIs in shock propagation during stress episodes.

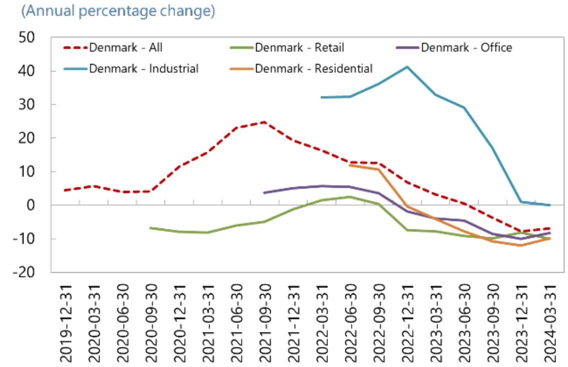
Market Risk

10. There is still an elevated, albeit declining, market risk for global and European markets associated with the potential for disorderly falls in asset prices. Asset prices may drop because of tight financing conditions and muted growth prospects, which could be amplified by the materialization of geopolitical risks (see IMF, 2024; ESRB, 2024; and EIOPA, 2024). In Denmark, the high exposure of NBFIs to market risk, along with their significant domestic and cross-border interconnectedness, could potentially translate into market stress, leading to subpar NBFI performance. Another risk that may arise is related to CRE for which the cycle may have not yet turned, and therefore, could still potentially experience further stress. There have already been two recent stress episodes that tested the resilience of the Danish NBFIs: the GFC and a sharp financial monetary policy tightening in 2022, which resulted in significant losses incurred by NBFIs. However, the system proved to be resilient.

Figure 6. Market Risk



Sources: Eurostat



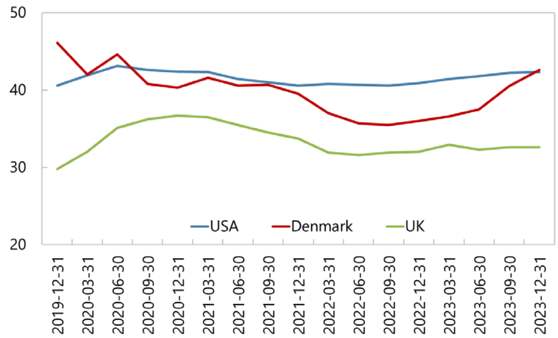
Sources: MSCI

Credit Risk

11. Corporate credit risks remain. The DN (2024) reports that higher interest rates made it more challenging for some Danish corporates to service their debt with earnings, especially in such sectors as industry, construction, trade, and real estate. This is confirmed by corporate credit risk parameters, including probability of default and loss given default (EBA, 2024). While equity prices have continued to rise over the past couple of years, should economic circumstances surrounding the corporate sector deteriorate in Denmark and key advanced economies, downward pressure on equity markets would resurface. This could, in turn, adversely affect the value of equities held by Danish NBFIs.

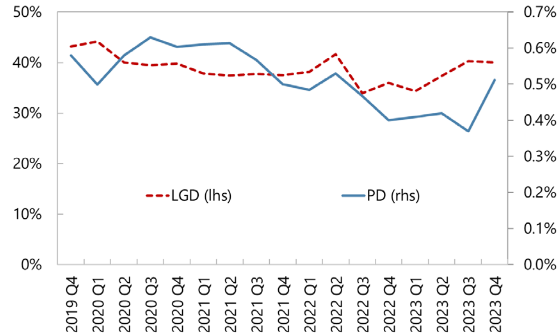
Figure 7. Credit Risk

Debt Service Ratio of Corporates
(Percent of income)



Sources: BIS

Credit Risk Parameters of Corporates
(Percent)



Sources: EBA

Macro-Financial Risk

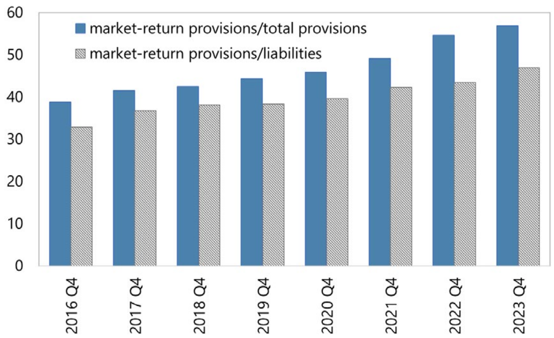
12. Denmark could potentially be prone to a significant wealth effect. Danish households have very large assets combined with a high level of household debt (IMF, 2018). Under an adverse scenario involving losses in household wealth, Denmark is estimated to be markedly impacted in terms of private consumption, reflecting a strong wealth effect (Hviid and Kuchler, 2017). This effect is stronger for Denmark than for most of other advanced economies, especially when combining the financial asset and housing wealth effects (Slacalek, 2009). This is confirmed by the experience of the GFC showing that household consumption in Denmark dropped by more than 6 percent in 2008 (Andersen and others, 2016).

D. Mitigating Factors

13. There are critical mitigating factors that reduce systemic risk stemming from NBFIs in Denmark. Pension companies hold one of the highest shares of non-guaranteed market return products in Europe: these products account for about 50 percent of total liabilities. This significantly mitigates the impact of market and credit risk materialization on their solvency and liquidity position. In addition, while there is a significant exposure to real estate markets, it is primarily an indirect exposure, mainly through covered bonds, which have demonstrated considerable resilience even during stress episodes (Box 1). This resilience has played an important role for the liquidity risk management of investment funds, given their sizable holding of covered bonds. Lastly, NBFIs play a limited role in the credit market, with their credit provision accounting for only around 10 percent of GDP.

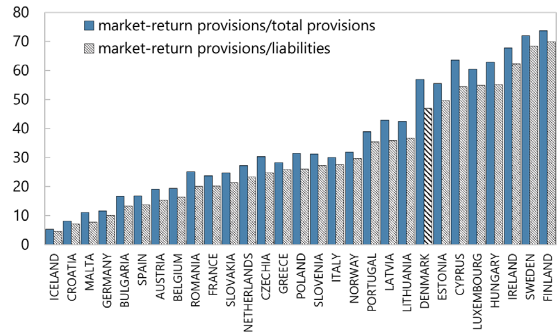
Figure 8. Mitigating Factors

Provisions for Pensions without Guarantees
(Percent)



Sources: EIOPA

Provisions for Pensions without Guarantees
(Percent)



Sources: EIOPA

E. Policy Options

14. The authorities could consider strengthening their systemic risk assessment and policy framework for NBFIs. Specifically, the authorities could (i) consider developing a comprehensive systemic risk assessment framework covering both banking and nonbanking institutions and (ii) consider developing a system-wide stress testing framework combining banking and nonbanking institutions.[4]

Systemic Risk Assessment

15. Implementing a comprehensive systemic risk assessment framework that covers both banks and NBFIs is crucial for countries with sizeable and interconnected financial systems. Central banks in advanced economies and international financial institutions have expanded the coverage of vulnerabilities and risks in NBFIs in their systemic risks assessment exercises.

- Financial stability reviews now routinely include systemic risk assessments for NBFIs, as seen in the reports from the Central Bank of Ireland (2024), the Bank of England (2024), and the Bank of Canada (2024).

- In the Netherlands and Sweden, where the NBFI sector is as sizable as in Denmark, the Dutch Central Bank (2024) and the Riksbank (2024) explicitly and extensively discuss emerging risks associated with NBFIs.

[4] In addition, there are ongoing policy initiatives to develop a macroprudential policy toolkit for NBFIs at the EU level (EC, 2024). For insurance companies and pension funds, the EIOPA has proposed incorporating macroprudential perspective into the Solvency II framework. The currently considered options include introducing dividend restriction or suspension, adding powers to reinforce liquidity position, and introducing temporary redemption rights for policy holders (EIOPA, 2021). The EIOPA (2020) also proposed to consider adding capital surcharge for systemic risk and introducing concentration thresholds. For investment funds, there are proposals aiming at addressing systemic risks related to liquidity mismatches and leverage (ESRB, 2017, 2020, 2022), which include activity-based measures, entity-based measures, and liquidity management tools. Furthermore, there are also ongoing efforts to address risks associated with margining practices and risk management of central counterparties (EC, 2022).

- The FSB (2021) has built a framework relying on a set of indicators covering asset prices, leverage, liquidity, and domestic and cross-border interconnectedness. The Central Bank of Ireland (2023) publishes a comprehensive heatmap gauging systemic risk arising from NBFIs as part of the Systemic Risk Pack at least once a year.

Stress Testing

16. An integral element of systemic risk assessment embedding NBFIs also includes developing a system-wide stress testing framework. In line with the EC (2010), both the FSB (2021) and the EIOPA (2019) advocate for system-wide stress tests to gauge the impact of NBFIs on systemic risk.

- ESMA (2019, 2020) provides guidelines for developing a stress-testing liquidity framework for investment funds.

- The ECB (2024) has recognized an important role played by NBFIs in their systemic risk assessments. They have started making explicit quantitative assessments of risks associated with NBFIs.

- The BoE (2023) has launched a stress test combining banks and NBFIs, with the latter including insurers, pension funds, investment funds, and central counterparties. The key objectives of the exercise are to enhance understanding of the risks posed by and to NBFIs and the behavior of NBFIs and banks in stress. This includes analyzing the drivers of such behaviors and investigating how these behaviors, along with market dynamics, can amplify market shocks and potentially pose risks to financial stability. Importantly, the efforts are carried out in collaboration with microprudential supervisors.

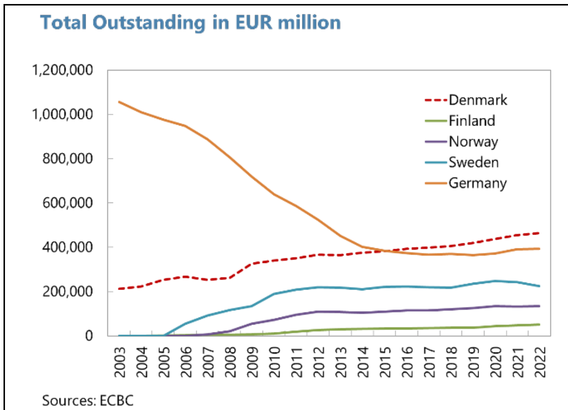
F. Conclusions and Policy Considerations

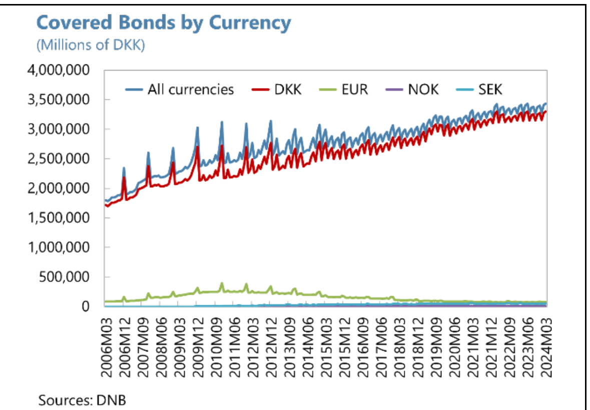
17. Systemic risk associated with NBFIs in Denmark appears to have been contained but requires close monitoring. Denmark's NBFI sector has substantially increased in size since the GFC, becoming an important part of the financial system. While there are benefits of the increased role of the NBFI sector, they may come with risks. Supervisors need to closely monitor leverage, liquidity buffers, as well as domestic and cross-border interconnectedness. Importantly, there are mitigating factors that reduce systemic risk stemming from NBFIs in Denmark. These include a high share of non-guaranteed market-return products and NBFIs' limited direct exposure to real estate markets and credit extension.

18. Strengthening of systemic risk assessment and policy framework for NBFIs is warranted. Many central banks in advanced economies and international financial institutions have expanded the coverage of vulnerabilities and risks in NBFIs in their systemic risk assessment exercises. Given the identified vulnerabilities and prevalent risks in Denmark, the authorities could consider developing a comprehensive systemic risk assessment framework covering both banks and NBFIs, which would subsequently pave the way for developing a system-wide stress testing framework combining banking and nonbanking institutions.

Box 1. An Overview of the Danish Covered Bond Market

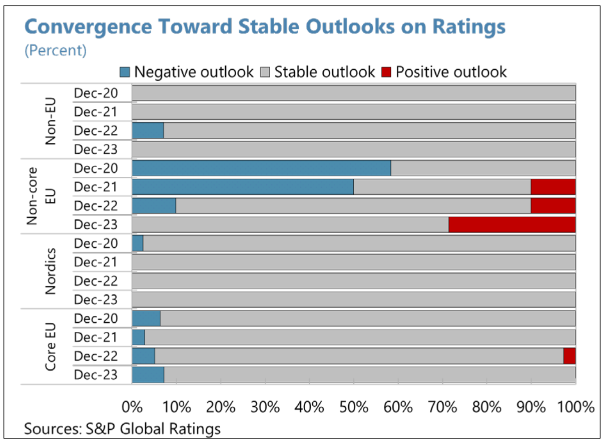
Denmark's covered bond market is globally the largest with an outstanding issuance of €436 billion (about 123 percent of GDP) as of end-2023. Unlike other covered bond markets in Europe, it is predominantly denominated in Danish Krone (DKK), with 96.8 percent of the total outstanding, while Euro (EUR) and Swedish Krona (SEK) each account for 1.6 percent. The market is divided into callable bonds, bullet bonds, and floaters with or without a cap. Although there is a high number of securities, most of the market value is concentrated in a few large series, with the majority issued by three large banks.





Compared to other European mortgage systems, the Danish system stands out in several areas. The Danish match funding is a notable difference and forms the basis of Danish covered bond legislation. The legislation complies with European standards and is among the most stringent, especially regarding the asset liability management risk. Mortgage banks offer pass-through products, thus eliminating the credit and market risk. The pass-through principle also implies that Danish mortgage borrowers may terminate their loans by buying back the mortgage bonds that fund their loans in the bond market and delivering them to their mortgage bank. This option, known as the delivery option or the buyback option, applies to all mortgage bonds, whether they are callable or non-callable. Risk ratings have remained stable even when other European markets experienced ratings deterioration in recent years. In this respect, Danish covered bonds are considered safe assets and have never defaulted.

Credit ratings of covered bonds have generally been stable, with over 90 percent of issuers maintaining a stable or positive rating outlook. This stability is further reinforced by additional notches that provide buffers against potential downgrades of the issuer's credit rating. Thus, while covered bonds are structured to minimize risk through dual recourse and are generally well-rated, their safety is not absolute and is closely tied to the financial health and credit rating of the issuers. Tracking the interconnectedness risk is of key importance.



The Danish covered bond market follows the guidelines and principles set out by the European Covered Bond Council (ECBC). The asset pool consists of both residential and commercial real estate with maximum loan-to-value limits at 80 percent and 60 percent, respectively. Overcollateralization exceeds the ECBC's minimum requirement of 2 percent; however, there is no official limit on commercial real estate assets in the asset pool.

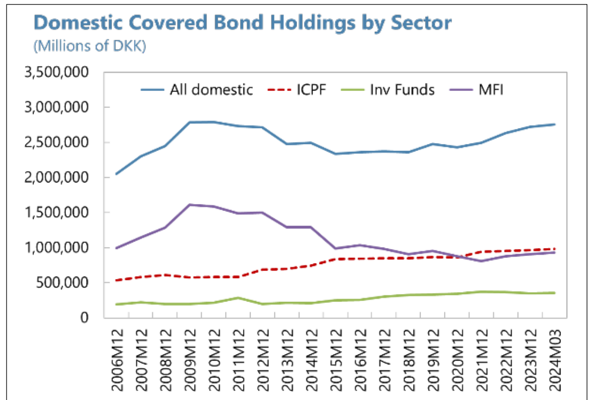
While covered bonds have had low risk with no default to date, they have not gone through global crises unscathed. During the global financial crisis (GFC) in 2008, the Danish covered bond market experienced a sudden liquidity dry-up, and as a result, the Danmarks Nationalbank intervened to ensure continuity in the market.

Box 1. An Overview of the Danish Covered Bond Market (concluded)

Buchholst, Gyntelberg, and Sangill (2010) show that, despite this liquidity shock, covered bonds behaved similar to government bonds in turmoil periods. Similarly, at the onset of the Covid pandemic in 2020, covered bonds experienced a widening of spreads, indicating reduced liquidity and trading; however, the market recovered rapidly.

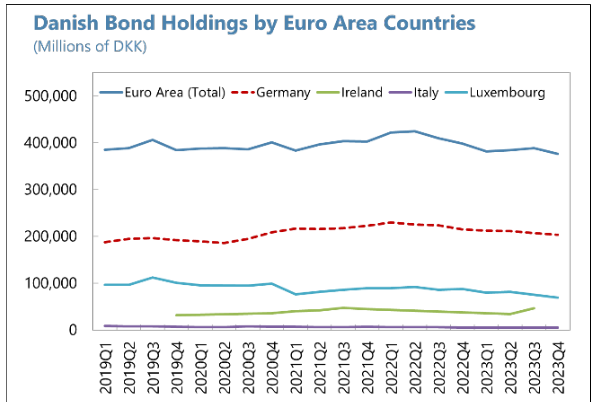
Since the GFC, there have been two significant changes in the Danish covered bond market concerning the investor profile: a change in the domestic investor base and an increased presence of foreign investors.

Domestic investors' covered bond holdings have increased to GFC levels in March 2024 at about DKK 2.8 billion. The sectoral composition has changed, particularly among banks (MFI), insurance companies and pension funds (ICPF), and investment funds. Banks decreased their share from 58 percent in 2009 to 34 percent in 2024, while ICPFs' share increased from 21 to 35 percent during the same period. Investment funds experienced a smaller increase from 9 to 13 percent.



Sources: DNB

Secondly, foreign ownership of Danish covered bonds has notably increased since the GFC. Since 2008, the share of foreign holdings rose significantly from 9 to 25 percent of total outstanding Danish covered bonds. This is slightly lower than its peak at 33 percent of total covered bonds in 2020 and 2021. Euro Area countries constitute about 56 percent of foreign holdings with the largest investments sourced from Germany, Luxembourg, Ireland, Italy and Finland as of end-2023. Asian countries, in particular Japan, have also increased their holdings. The currency mismatch risk is low, considering that about 96 percent of the covered bonds are denominated in DKK, implying that foreign holdings are mostly DKK-denominated.

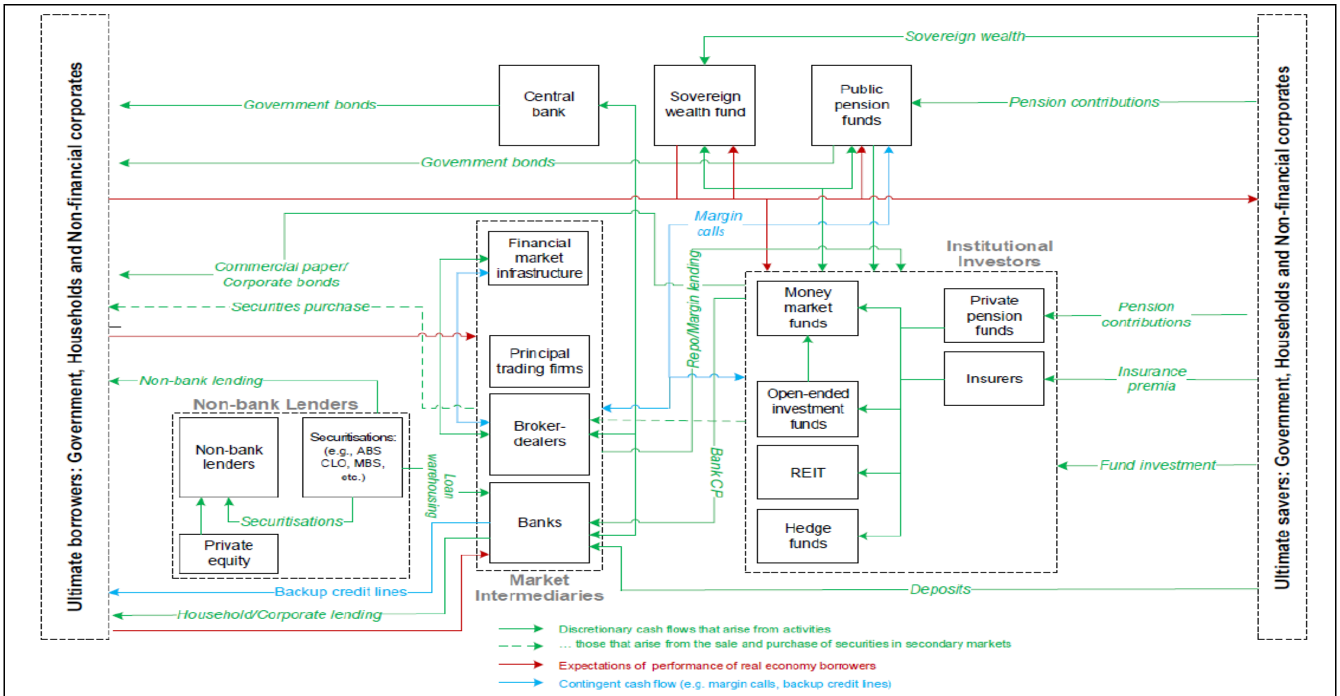


Sources: DNB and ECBC

Overall, Denmark's covered bond market remains stable with changes in its underlying dynamics. Any vulnerabilities and risks should continue to be monitored by the authorities to contain the systemic risk, including the continuous review of the macroprudential policy stance, to safeguard the financial system.

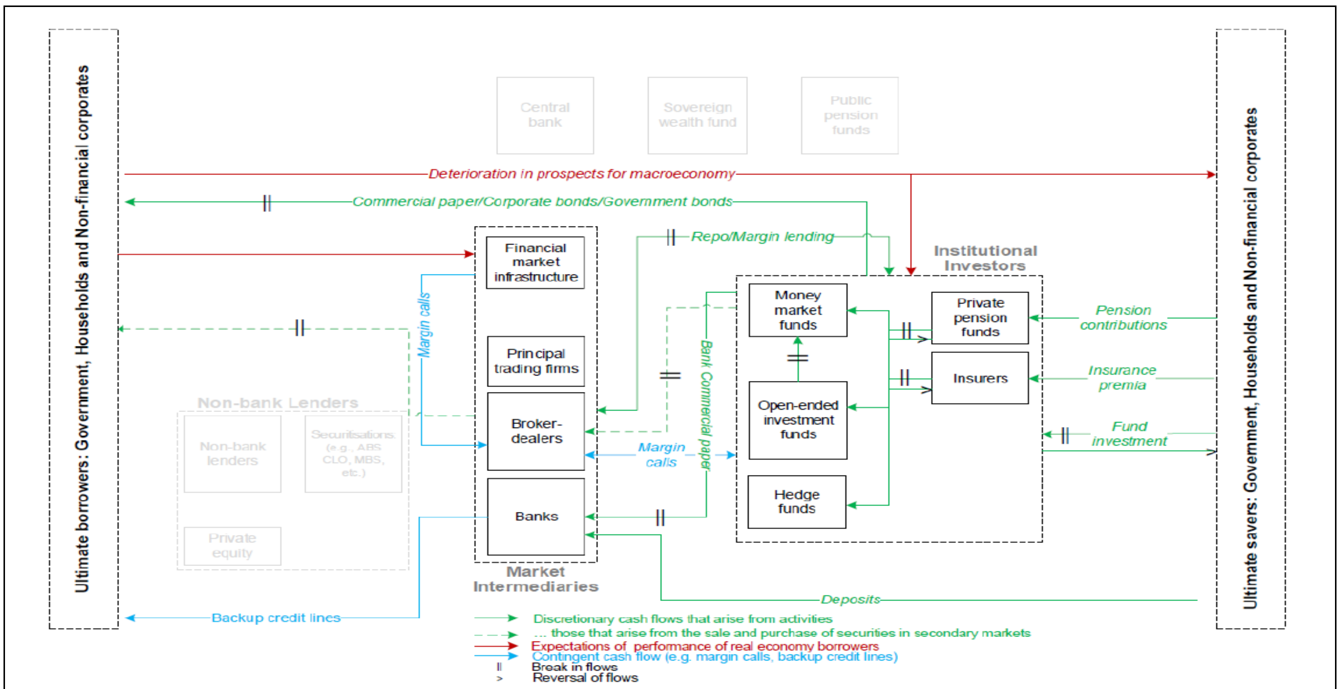
Annex I. Interconnectedness of the Financial Sector

Interconnectedness of NBFIs for a Stylized Advanced Economy



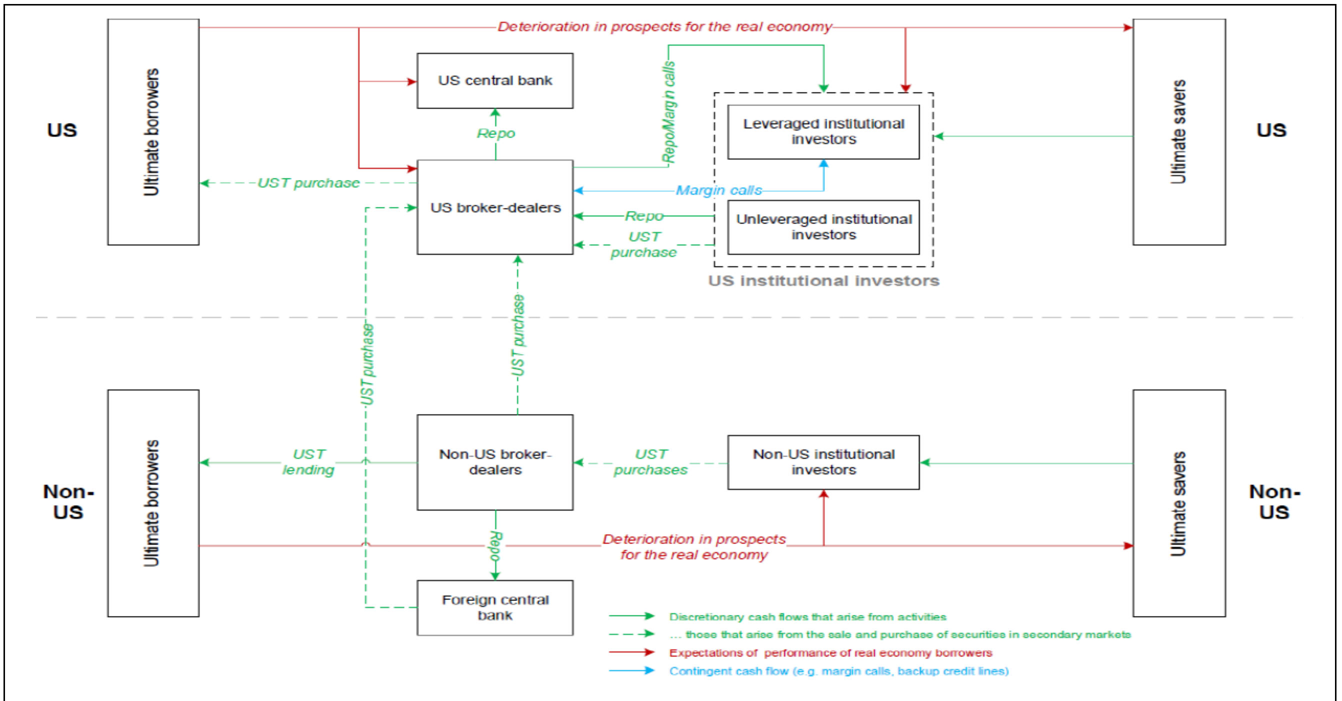
Source: FSB (2020)

Propagation Through Short-Term Funding Markets



Source: FSB (2020)

Propagation Through Core Government Bond Markets



Source: FSB (2020)

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