



SWEDEN

FINANCIAL SYSTEM STABILITY ASSESSMENT

November 2016

This paper on Sweden was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on October 26, 2016.

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October 26, 2016

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James Morsink
and **Mahmood Pradhan**

Prepared by
Monetary and Capital
Markets Department

This report is based on the work of the Financial Sector Assessment Program (FSAP) mission that visited Sweden in April 18–29 and August 22–September 2, 2016. The FSAP findings were discussed with the authorities during the Article IV consultation mission in September 2016.

- The team comprised Martin Čihák (mission chief), Liliana Schumacher (deputy mission chief), Jihad Al-Wazir, Atilla Arda, Jiaqian Chen, Eija Holttinen, Ivo Krznar, Martin Edmonds (all IMF staff); Michael Andrews, Timo Broszeit, Louise Carter, Francesco Columba, Jonathan Fiechter, and Ian Tower (all external experts); Craig Beaumont (mission chief for Sweden’s Article IV consultation) and Tomas Östros (IMF Executive Director) participated in the concluding discussions. Dale Gray (IMF staff) joined a part of the mission to present an analysis, prepared with Rima Turk and Andy Jobst. Rima Turk presented studies from IMF headquarters. Richard Lalonde, Jonathan Pampolina, and others provided additional support from IMF headquarters.
- The team met management and staff of Riksbank, Finansinspektionen, Ministry of Finance, and National Debt Office, as well as representatives of the Parliament, financial services companies, financial market infrastructure providers, research organizations, think-tanks and other nongovernment organizations. The team also met officials from other countries in the region.
- The FSAP assesses the stability of the financial system as a whole and not that of individual institutions. It is 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 the FSAP.
- Sweden is deemed by the Fund to have a systemically important financial sector, and this stability assessment is part of bilateral surveillance under Article IV of the Fund’s Articles of Agreement.
- The report was prepared by Martin Čihák and Liliana Schumacher, with inputs from the Sweden FSAP team members. The report draws on seven Technical Notes.

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Glossary

AML/CFT	Anti Money Laundering/Combating the Financing of Terrorism
bps	basis points
BRRD	Bank Recovery and Resolution Directive (European Union)
BU	Bottom-up (stress test)
CET1	Common Equity Tier 1 capital
CRD-IV	Fourth Capital Requirements Directive (European Union)
DTI	Debt-to-income
EBA	European Banking Authority
ECB	European Central Bank
EDF	Expected Default Frequency
EEA	European Economic Area
ELA	Emergency Liquidity Assistance
EU	European Union
FI	Finansinspektionen
FMI	Financial Market Infrastructure
FSAP	Financial Sector Assessment Program
FSC	Financial Stability Council
GDP	Gross domestic product
G-SIB	Global Systemically Important Bank
IRB	Internal Ratings Based
LCR	Liquidity Coverage Ratio
LTV	Loan-to-value
MOF	Ministry of Finance
MoU	Memorandum of Understanding
MREL	Minimum Requirements for Own Funds and Eligible Liabilities
NDO	National Debt Office
NSFR	Net Stable Funding Ratio
NPL	Nonperforming loan
PD	Probability of default
RB	Riksbank
ROA	Return on assets
ROE	Return on equity
SEK	Swedish kronor
TD	Top-down (stress test)

EXECUTIVE SUMMARY

The Swedish financial system is large and highly interconnected, putting a premium on the accompanying policy framework. Relative to the size of the domestic economy, the financial system is among Europe's largest. It features complex domestic and international linkages, reflecting Sweden's role as a regional financial hub. The systemic nature of the financial sector raises expectations for the quality of the policy framework and financial safety nets.

The authorities have followed up on the 2011 FSAP recommendations. They have taken important steps to strengthen the policy and regulatory framework. These steps include creating the Financial Stability Council (FSC), increasing resources at Finansinspektionen (FI), and introducing a new resolution framework for credit institutions and investment firms.

Nonetheless, macrofinancial risks have grown since 2011, for example the rising share of highly indebted households. Although the immediate effect of a potential decline in housing prices on Swedish households appears contained, the indirect macroeconomic impact—including via the corporate sector—could be sizeable. In an extreme but plausible scenario, this could combine with a broader loss of confidence in housing collateral, amplified by Swedish banks' reliance on wholesale funding. Given the high interconnectedness among the Nordic-Baltic financial systems, such a shock could have significant cross-border spillovers.

Stress tests suggest that banks and nonbanks are largely resilient to solvency shocks, but concerns persist about the ability of bank models to capture unexpected losses. It is important to preserve and strengthen the risk-based approach to supervision. However, modeling tail risks in Sweden is challenging, and available models may suffer from overreliance on recent historical experience. To safeguard against model and measurement errors in calculating capital ratios, the mission recommends a timely adoption of a leverage ratio as a backstop.

Banks' structural liquidity gaps have narrowed, but are still more pronounced than for European peers, and justify the adoption of monitoring beyond international standards. Banks are reliant on wholesale funding and have significant maturity mismatches. To improve the oversight of banks' liquidity profile, the mission recommends monitoring an extended Liquidity Coverage Ratio (LCR) in euro and U.S. dollar. Close monitoring of banks' interconnectedness through the covered bond market would be another important step towards increasing resilience.

The mission recommends addressing key data gaps that reduce the efficacy of systemic risk oversight. Given the household sector indebtedness issue, a crucial missing element is data on the distribution of household financial assets, available in many other countries but discontinued in Sweden. For systemic risk monitoring purposes, the mission recommends introducing comprehensive anonymized surveys of household balance sheets. The mission recommends enhancements in the stress testing framework of banks, insurance companies, and investment funds. FI should improve the availability and quality of investment fund data, to enhance the authorities' ability to conduct stress testing and other analyses. To better understand the effects of shocks on the broader economy, it will be important to undertake periodic stress tests of corporate resilience.

The authorities have responded to increasing household debt, but need to take additional steps. The response—which relies on macroprudential measures targeting credit supply and a mandatory statutory amortization requirement—goes in the right direction, but it is important to add a cap on the debt-to-income (DTI) ratio to the macroprudential policy toolkit, as a tool to help contain the risks from high household indebtedness. To further reduce imbalances, the mission urges the authorities to remove tax benefits associated with holding real estate and funding it with debt. In the medium term, further policy action is needed to remove obstacles to housing supply.

Sweden’s financial stability framework needs strengthening. The macroprudential framework should allow FI to be more proactive in adopting measures and issuing regulations. A statute should clearly define the FI’s responsibility for macroprudential policy and ensure that FI has powers, tools, and resources to address systemic risks in a timely and effective manner. The FSC is an improvement since the 2011 FSAP, but addressing its limitations will promote financial stability in Sweden and help realize Sweden’s responsibilities for financial stability in the region. The mission recommends that the legal framework clearly sets out the objectives, functions, and powers of the FSC. The FSC’s mandate should be expanded to include crisis preparedness.

FI needs to step up supervisory intensity. Bolstering FI’s ability and willingness to act requires financial and human resources that are sustainable and commensurate with the size and complexity of the financial system. It also requires broadening FI’s mandate to issue binding regulations on safety and soundness issues. FI needs to enhance cooperation with foreign supervisors, especially in the supervision of systemic bank branches and cross-border management of investment funds.

The authorities should amend the Riksbank Act to clarify the Riksbank’s financial stability mandate. This should include a clear role in the oversight of systemic risk and explicit confirmation of statutory authority to extend emergency liquidity assistance (ELA) for financial stability purposes to individual banks and the financial system as a whole. The law should also prescribe coverage by the state of a shortfall in the Riksbank’s capital and general reserve; this should be complemented with ex ante, standing indemnification and guarantee arrangements for liquidity assistance losses if incurred by the Riksbank, which would not subject each ELA operation to ad-hoc approval from third parties. To ensure the availability of ELA in foreign exchange, the Riksbank should seek to conclude swap-agreements with central banks in jurisdictions where Swedish banks operate through branches.

The safety net and crisis management framework rests on strong foundations, but further investments are needed to ensure operational capacity to rapidly deploy recovery and resolution tools. Under the FSC’s auspices, the authorities need to ensure agency-specific and national financial crisis preparedness, including a national crisis management plan, and regular single- and multi-agency financial crisis simulation exercises. The Nordic-Baltic Stability Group needs to be revamped to fulfill a similar role at the regional level. The authorities should define strategies for liquidity assistance to banks in resolution and conclude a cooperation agreement for the solvency and viability assessment of institutions that need liquidity assistance. The authorities need to ensure that appropriate and sustainable financial and human resources are allocated to recovery and resolution planning commensurate with the size and complexity of Sweden’s financial sector and the country’s home-country responsibilities

Table 1. Key Recommendations		
	Recommendations, Responsible Authorities, and References to Main Text	Time *
	Financial Stability	
1	Introduce a cap on the debt-to-income ratio (FI/MoF; ¶112)	NT
2	Remove tax incentives to hold real estate assets and fund them with debt (MoF; ¶12)	NT
3	Timely adoption of a leverage ratio as a backstop (FI; ¶124)	NT
4	Monitor an extended (three-month) LCR in euro and U.S. dollar (FI; ¶127 and 46)	NT
5	Introduce regular surveys on the distribution of household balance sheets (MoF; ¶140)	I
6	Introduce regular stress tests of corporate resilience (FI; ¶114)	I
7	Improve stress testing framework for banks and insurance companies (FI, RB; ¶123, ¶130)	I
	Macroprudential Policy, Systemic Risk Oversight, and Systemic Liquidity Management	
8	Give FI a clear legal mandate for macroprudential policy, ensuring that FI has tools to address systemic risks in a timely and effective manner (MoF; ¶138)	I
9	Give the FSC, or a similar body, a statutory basis with power to issue recommendations, preferably with a 'comply or explain' attribute; expand its mandate to include crisis preparedness; establish two preparatory groups: (i) systemic risk monitoring and (ii) crisis preparedness and management (MoF; ¶139)	MT
10	Amend the RB Act to: (1) clarify the RB's role in financial stability, including by confirming the RB's authority to extend liquidity assistance for financial stability purposes; and (2) ensure the RB is in a strong financial position and protected from potential losses on such liquidity assistance (MoF; ¶166)	MT
11	Seek to establish swap agreements with central banks in the Nordic countries, the Fed, and the ECB, aiming to strengthen the availability of ELA in relevant currencies (RB; ¶145 and ¶166)	NT
	Financial Sector Regulation and Supervision	
12	Broaden FI's mandate to issue binding regulations on safety and soundness issues (MoF; ¶149)	MT
13	Ensure that the same level of protection is provided to occupational pensions as to life insurance (MoF; ¶150)	NT
14	Improve the availability and quality of investment fund data and enhance FI's ability to conduct stress testing and other analyses for investment funds (FI; ¶133 and 55)	NT
15	Enhance cross-border supervisory cooperation, including in the supervision of systemic bank branches and cross-border management of investment funds (FI; ¶134, ¶134, ¶157, Box 1)	NT
	Crisis Readiness, Management, and Resolution	
16	Under the FSC's auspices, ensure agency-specific and national financial crisis preparedness, including a national crisis management plan, updated bi- and multilateral cooperation MoUs, and regular single- and multi-agency financial crisis simulation exercises (MoF/NDO/FI/RB; ¶165)	NT,C
17	Seek to revamp the Nordic-Baltic Stability Group, supported by updated bi- and multilateral MoUs, to strengthen crisis preparedness and management, including regular financial crisis simulations exercises (MoF/NDO/FI/RB; ¶165)	NT,C
18	Expedite resolution planning for systemic financial institutions (NDO; ¶164)	I
19	Define strategies for liquidity assistance to banks in resolution, and conclude a cooperation agreement for the solvency and viability assessment of institutions that need ELA (RB/NDO/FI; ¶165, ¶166)	I
	Resources	
20	Increase financial and human resources allocated for prudential supervision, and recovery and resolution planning, to ensure that resource levels are commensurate with the size and complexity of Sweden's financial sector and home-country responsibilities (MoF/FI/NDO; ¶140, ¶147, ¶148, ¶151, ¶152, ¶160, ¶164)	I
* C = continuous; I (immediate) = within one year; NT (near term) = 1–3 years; MT (medium term) = 3–5 years		

MACROFINANCIAL SETTING

1. Sweden's financial system is large, with assets of about 5.5 times GDP.

- The banking sector comprises more than two thirds of the financial system, with one global systemically important bank (G-SIB) and three banks designated by FI as Other Systemically Important Institutions. The four banks account for over three-quarters of the Swedish banking market and have extensive reach across the Nordic-Baltic region (Figure 1).
- The insurance sector is dominated by life insurance companies, many of which specialize in occupational pension insurance. Total insurance assets were about 100 percent of GDP at end-2015, of which 88 percent are in the life insurance sector. There are over 300 insurance companies in Sweden, but most are small local firms. Industry concentration is high.
- Capital markets are well developed. Outstanding government and corporate bonds are equivalent to about 85 percent of GDP and stock market capitalization is about 140 percent of GDP. Covered bonds account for about 45 percent of the bond market, with government securities comprising an additional 25 percent. The rest is largely made up of highly rated corporates and a small but growing portion of smaller and less highly rated issuers. Foreign investors hold about one-quarter of outstanding Swedish bonds, equivalent to more than 20 percent of GDP. Securities markets services can be easily provided on a cross-border basis.
- Four critical domestic financial market infrastructures (FMIs) operate in Sweden: RIX, the real-time gross settlement payments system, owned and operated by the Riksbank; Bankgirocentralen BGC AB, which processes a range of retail payments, cash withdrawals, and card payments; one domestic central counterparty, NASDAQ Clearing, which clears exchange-traded financial and commodity derivatives, over-the-counter (OTC) interest rate derivatives (IRD) and repos; and one domestic central securities depository (CSD) and securities settlement system (SSS) for Swedish shares and fixed income securities, Euroclear Sweden. There are no trade repositories. Several FMIs located outside Sweden are also relevant for the Swedish financial system

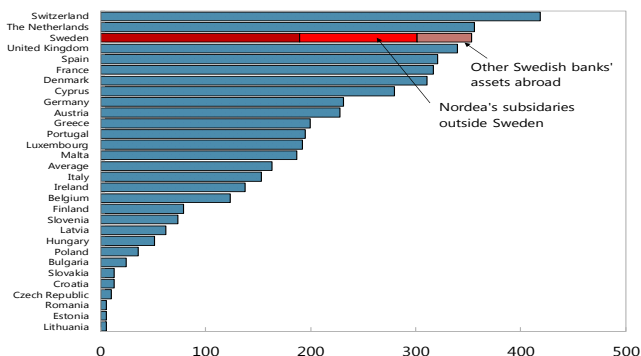
2. Sweden's oversight framework relies on three institutions and the Ministry of Finance. FI is the single supervisor, with a mandate also for consumer protection and macroprudential issues. The central bank (Riksbank) is in charge of monetary policy, systemic liquidity, and payments oversight. The National Debt Office (NDO) acts as the resolution and deposit insurance authority. The Ministry of Finance (MoF) drafts financial legislation. The Riksbank is an independent authority under the Parliament, while FI and NDO are authorities under the government. FI's and NDO's budgets are approved by the MoF. The government proposes legislation to the Parliament, which allocates mandates and budgets to authorities such as FI. Based on authorization by the government, FI issues secondary regulation. There are plans in the parliament to review the Riksbank Act, and the MoF is analyzing options to clarify FI's macroprudential policy mandate.

Figure 1. Key Structural Aspects of Swedish Banks

Swedish banks are large and interconnected...

Bank Assets, December 2014

(Percent of GDP)



Source: Riksbank.

...through their operations in the Nordic-Baltic region.

Breakdown of the Major Banks' Lending, 2014

(Percent)

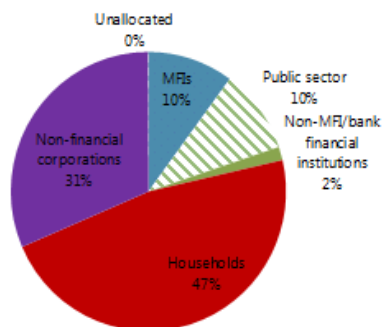
	Other Nordic	Baltic	Sweden	Germany	United Kingdom	Rest of the World
Swedbank	86.1	3.9	9.5	0.0	0.0	0.5
SEB	73.0	4.1	8.2	11.1	0.0	3.6
Nordea	23.9	66.3	2.3	0.0	0.0	7.5
Handelsbanken	62.9	22.5	0.0	0.3	9.5	5.1
Four major banks	52.1	34.7	4.0	1.9	2.2	5.0

Sources: Bank reports; and Riksbank.

Lending to households is a dominant business in Sweden...

Swedish-Owned MFIs Consolidated Claims in Sweden, 2015

(Percent)

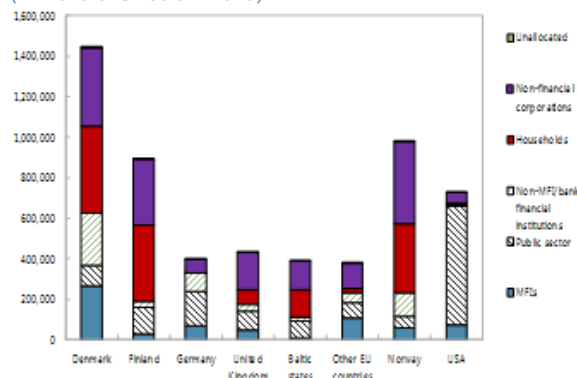


Source: Riksbank.

...and in the region.

Swedish-Owned MFIs Consolidated Claims Abroad

(Millions of Swedish krona)

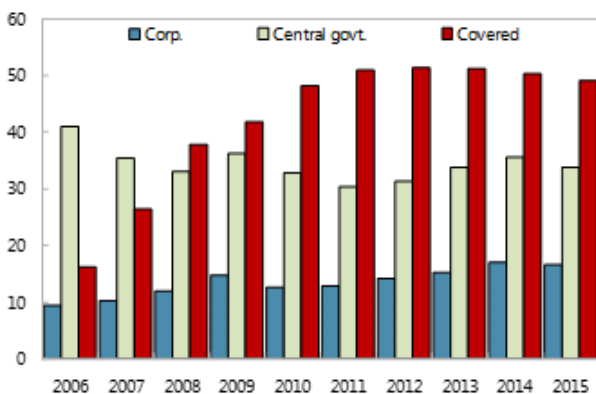


Source: Riksbank.

Mortgages contributed to development of the covered bond market...

Outstanding Bonds

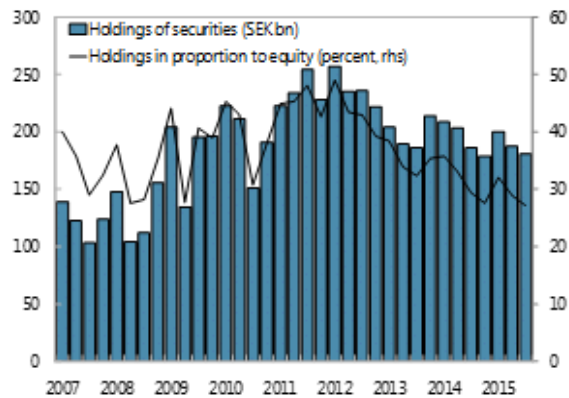
(Percent of GDP)



Sources: Mortgage Bond Association; Statistics Sweden; and Riksbank.

...which is a key source of interconnectedness among banks.

The Major Banks' Holding of Other Banks' Securities



Source: Riksbank.

Table 2. Selected Economic Indicators, 2013–19

	2013	2014	2015	Projections			
				2016	2017	2018	2019
Real economy (in percent change)							
Real GDP	1.2	2.6	4.1	3.4	2.4	2.2	2.1
Domestic demand	1.6	2.9	4.0	4.3	2.7	2.4	2.2
Private consumption	1.9	2.1	2.7	2.6	2.4	2.3	2.2
Public consumption	1.3	1.5	2.5	3.6	1.9	1.2	1.0
Gross fixed investment	0.6	5.5	7.2	6.9	3.9	3.8	3.6
Net exports (contribution to growth)	-0.3	-0.1	0.3	-0.6	-0.1	-0.1	0.0
HICP inflation (e.o.p)	0.4	0.3	0.7	1.2	1.6	2.0	2.2
Unemployment rate (in percent)	8.0	7.9	7.4	6.9	6.7	6.7	6.7
Gross national saving (percent of GDP)	27.8	28.0	29.5	30.4	31.1	31.3	31.3
Gross domestic investment (percent of GDP)	22.5	23.3	24.2	25.5	26.0	26.3	26.5
Output gap (as a percent of potential)	-2.8	-2.2	-0.7	0.9	1.0	0.7	0.4
Public finance (in percent of GDP)							
Total revenues	50.9	50.1	49.1	48.9	48.9	48.9	48.7
Total expenditures	52.2	51.7	48.9	49.1	49.1	49.1	48.7
Net lending	-1.3	-1.6	0.2	-0.2	-0.3	-0.2	0.0
Structural balance (as a percent of potential GDP)	-0.5	-0.6	0.0	-0.5	-0.9	-0.5	-0.1
General government gross debt, official statistics	39.8	44.6	42.9	41.6	40.5	39.4	38.8
Money and credit (year-on-year, percent change, eop) 1/							
M3	3.1	4.1	7.6	8.5	...	...	...
Bank lending to households	4.9	6.0	7.4	7.4	...	...	...
Interest rates (end of period)							
Repo rate 2/	0.8	0.0	-0.4	-0.5	...	...	...
Ten-year government bond yield 2/	2.1	1.7	0.7	0.2	...	...	...
Mortgage lending rate 3/	2.5	1.9	1.6	1.6	...	...	...
Balance of payments (in percent of GDP)							
Current account	5.3	4.6	5.2	4.9	5.1	5.0	4.7
Foreign direct investment, net	4.4	1.0	2.7	2.6	2.8	2.6	2.6
International reserves, changes (in billions of US dollars) 4/	14.6	0.2	1.3	0.5	...	...	...
Reserve cover (months of imports of goods and services)	3.4	3.3	3.5	...	...	...	...
Net international investment position	-12.6	-0.3	4.1	6.0	8.1	10.1	12.0
Exchange rate (period average, unless otherwise stated)							
SEK per euro 2/	8.7	9.1	9.4	9.4	...	...	...
SEK per U.S. dollar 2/	6.5	6.9	8.4	8.4	...	...	...
Nominal effective rate (2010=100) 5/	108.5	103.7	97.5	96.7	...	...	...
Real effective rate (2010=100) 5/ 6/	103.4	98.8	94.7	95.7	...	...	...
Fund Position (August 31, 2016)							
Quota (in millions of SDRs)				4430.0			
Reserve tranche position (in percent of quota)				1.8			
Holdings of SDRs (in percent of allocation)				87.4			

Other Indicators

GDP per capita (2015, USD): 50,591; **Population** (2016, million): 9.9; **Main products and exports**: Machinery, motor vehicles, paper products, pulp and wood; **Key export markets**: Germany, Norway, United Kingdom

Sources: IMF's *World Economic Outlook*; Sveriges Riksbank; Sweden's Ministry of Finance; Statistics Sweden; and IMF staff calculations.

1/ Data for 2016 is as of August 2016.

2/ Data for 2016 is as of September 2016.

3/ Mortgage rates for new contracts, data for 2016 is as of June 2016.

4/ Data for 2016 is as of Q2 2016.

5/ Data for 2016 is as of August 2016

6/ Based on relative unit labor costs in manufacturing.

3. A Financial Stability Council (FSC) was created in 2013. It is chaired by the Ministry of Finance and comprises the Riksbank Governor, FI Director General, and the NDO Director General. It is a forum for, among other things, monitoring financial stability and discussing the need for measures to prevent financial imbalances and crisis management measures. It has no decision-making powers.

4. The authorities have followed up on the 2011 FSAP recommendations. In addition to establishing the FSC, they increased FI's resources, and introduced a new resolution framework for credit institutions and investment firms. Appendix I reviews the main steps taken since the last FSAP.

5. Since 2011, the economy has regained speed. Following the sharp rebound in 2010, economic activity was flat for much of 2011–13. Growth has accelerated to 4.1 percent in 2015, driven by strong domestic demand supported by exports. Employment growth picked up in 2015–16, bringing the unemployment rate down to under 7 percent in 2016, from around 8 percent in 2011–14. Household disposable income growth averaged to about 3.5 percent per annum in 2012–2015. The public debt was low at 43 percent of GDP in 2015, underpinned by the prudent fiscal framework. Inflation remains below the target, but has risen from its low in 2014 (Table 2).

RISKS AND VULNERABILITIES IN HOUSEHOLDS' AND CORPORATES' BALANCE SHEETS

A. The Housing Market

6. Housing finance creates vulnerabilities for financial stability due to specific features of Swedish residential mortgages, high household debt, and rising asset prices (Figure 2).

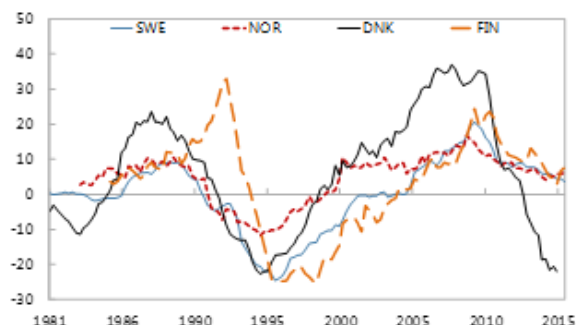
- The stock of mortgage loans granted before June 2016 does not have mandatory amortization. A typical Swedish mortgage contract has a contractual maturity of 30–50 years, with even longer maturities not unusual. In most countries, loans with no amortization requirements are considered high-risk, and are subject to more restrictive lending standards.
- Household debt has been rising relative to income with new borrowers taking on increasingly high debts. The share of new mortgage borrowers with debt-to-income (DTI) ratios above 450 (600) percent was about 37 (17) percent in 2015, up from 21 (10) percent in 2011. The credit to GDP gap has declined but it is still positive and credit to households is growing faster than disposable income. Households are vulnerable to interest rate increases (70 percent of residential mortgages are based on floating rates).
- House prices have risen to high levels, slowing only recently. The price-to-income ratio is 40 percent above its 20-year average, among the highest in advanced economies, raising a red flag. Research suggests that house prices are 12 percent above long-run equilibrium (IMF Working Paper 15/276). House price gains provide incentives for households not to amortize loans and take out even larger loans relative to income, aided by longer loan maturities. Mortgage interest rate deductibility and the lack of a property tax further propel house demand.

7. The pace of housing completions represents less than 1 percent of the housing stock, lagging behind rising population, especially in urban areas. Restrictions on land acquisition and planning procedures at the municipal level impair the expansion of housing supply, and rigidities associated with rental market controls do not help.

Figure 2. Nordic Countries: Assessment of Cyclical Vulnerabilities

Credit gaps are still positive but declining...

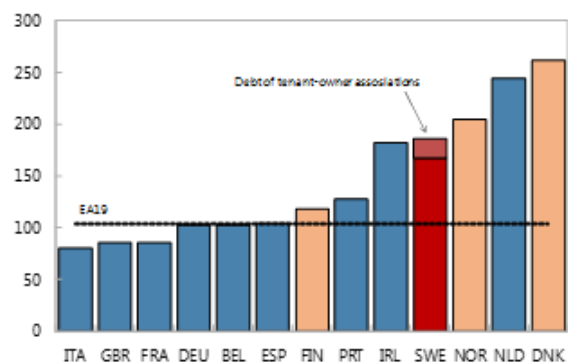
Credit Gaps
(Percent of GDP)



Source: National authorities.

Moreover, the Nordic household debt-to-income ratio is among the largest in Europe.

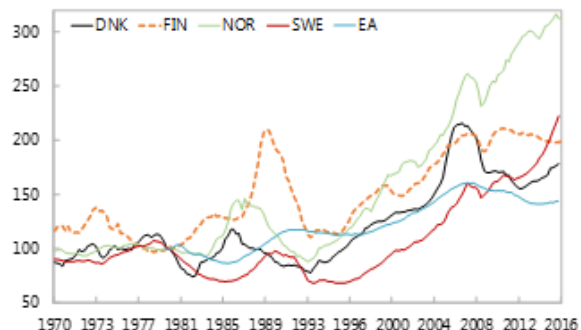
Household Debt, 2015:Q4 or Latest Available
(Percent of disposable income)



Sources: Statistics Sweden; and IMF staff calculations.

...and house prices keep rising in Sweden and Norway.

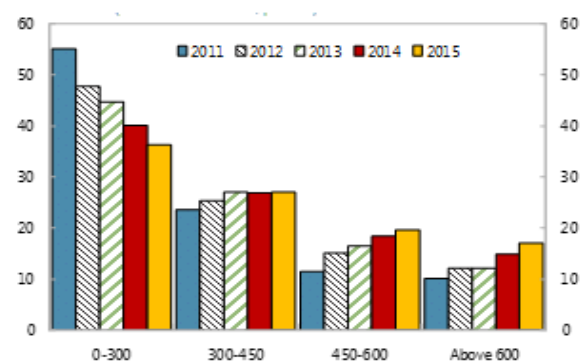
Real House Prices
(Index, 1980 = 100)



Source: OECD.

...and the proportion of households with high debt is growing.

Sweden: Debt-to-Income Ratios for New Mortgages
(Share of households, percent)



Sources: Finansinspektionen; and IMF staff calculations.
Note: Debt-to-income ratios based on household's total debt and disposable income (after tax).

8. FI's view is that the rising house prices and high household debt do not entail high credit risk for banks, but they do add to macroeconomic vulnerabilities. Swedish mortgages are full recourse loans, most households have high savings, and social benefits are generally sufficient to limit defaults even in less financially secure households. Moreover, loan origination includes stress tests of the adequacy of household buffers at high interest rates. Rather than distress, supervisors are concerned with the impact of households deleveraging if they come under stress, as reduced

consumption would impact employment and smaller firms. FI's stress tests on household level data for new mortgage originations are in line with this assessment.

9. High asset valuations do not necessarily lead to asset price declines, but if a fall were to happen, the corrections could be much larger and damaging, especially given the high household debt. A 20 percent house price decline could reduce GDP by 2.6 percent,¹ with a greater impact if it coincided with a global downturn. It would affect banks directly through nonperforming loans (NPLs) and second round effects may arise from the impact of lower domestic demand on enterprises. Given the high interconnectedness within the Nordic-Baltic financial systems, a fall in house prices with an associated loss of confidence in the Swedish housing market collateral could trigger disturbances across the region. The high reliance on wholesale funding and covered bond concentration in bank portfolios would act as an amplifier.

10. Even though households appear resilient, it is challenging to be conclusive about how scenarios of falling asset prices and higher interest rates would play out. Stress tests may not capture all second round effects. Prices of household assets are exposed to market volatility, and there are no data on households' wealth distribution that can be compared with the distribution of debt burden or used for stress testing purposes. Pre-crisis data suggests that households with higher debt relative to income typically have lower liquid assets.²

11. The authorities have responded to increasing household debt with macroprudential measures focusing on credit supply (Table 3). An 85 percent cap on LTV ratios, adopted in 2010, has not contained indebtedness, given rising prices and the possibility of taking uncollateralized loans above the cap. The lack of mandatory amortization has taken a long time to address given FI's insufficient mandate. A mandatory statutory amortization requirement became effective on June 1, 2016. The impact of recent macroprudential measures is not yet clear.

Table 3. Macroprudential Measures Adopted since 2011

Measure	Implementation
Maximum LTV ratio, 85 percent	October 2010
Risk-weight floor for mortgages, 15 percent	May 2013
LCR regulation, including in euro, U.S. dollar, and total	January 2014
Pillar II capital add-on 2 percent for the four largest banks	September 2014
Risk-weight floor for mortgages, 25 percent	September 2014
Systemic risk buffer 3 percent for four largest banks	January 2015
Counter-cyclical capital buffer activated at 1 percent	September 2015
Amortization requirement	June 2016
Counter-cyclical capital buffer raised to 1.5 percent	June 2016
Counter-cyclical capital buffer raised to 2.0 percent	March 2017

Sources: IMF staff based on information from the authorities.

¹ <http://www.konj.se/download/18.42684e214e71a39d0723a0c/1436518472414/Working-Paper-138-Macroeconomic-Effects-of-a-Divide-in-Housing-Prices-in-Sweden.pdf>

² https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=SED2016&paper_id=1015

12. The recent amortization requirement and the government’s 22–point proposal for more housing are welcome, but more is needed to address distortions in the housing market. The impact of the amortization requirement is likely to be limited as only new borrowers are affected. The mission recommends:

- Introducing a cap on the DTI ratio to increase household resilience and prevent higher housing prices from driving up household indebtedness. Although a cap on the DTI ratio would initially affect a small portion of borrowers, the cap would become more binding as house prices rise relative to income, tending to lean against the cycle, unlike LTV limits. Reflecting their benefits, DTI caps were introduced in the United Kingdom and Ireland, which recently experienced strong house price dynamics, and the measure is under consideration in New Zealand and Norway;
- Giving FI flexibility to calibrate LTV ratios. LTV limits directly reduce the funding available to borrowers, hence they can reduce housing demand, leading to a decrease in credit and house price growth;
- Eliminating mortgage tax deductibility or revisiting the property tax ceilings to moderate the incentives to accumulate housing debt; and
- Further easing the housing supply constraints associated with excessively restrictive regulations in the use of land.

B. The Nonfinancial Corporate Sector

13. Data on Swedish corporates suggest vulnerabilities that should be monitored (Table 4). Large corporates appear to have strong interest coverage ratios, but the strength declines with corporate size. About half of corporate debt is denominated in foreign currency, and banks usually do not require clients to have income in foreign currency as a condition for granting foreign currency loans. A 250 basis points (bps) shock to interest rates would bring the interest coverage ratio of medium and small corporations to about 1.5. This would be aggravated if a recession reduced corporations’ earnings. Corporate fragility is particularly important for banks with sizeable exposures to small and medium enterprises and in scenarios in which households would deleverage. Corporates represent about 30 percent of banks’ total exposures.

14. The mission recommends including corporate risks in FI’s risk analysis. This could be done by implementing regular top-down stress tests of corporate resilience (along the lines of what FI currently uses for assessing household resilience) to gauge the impact of macroeconomic instability on corporates’ ability to repay debt. Enhanced supervisory focus on small and medium enterprise portfolios, in particular for banks with concentrations in such exposures, is warranted.

Table 4. Corporate Vulnerabilities

	2009	2010	2011	2012	2013	2014	Scenario 1	Scenario 2
OMX 30								
<i>Memo: 12.6% of total assets</i>								
Total Liabilities/Total Equity	154	146	156	142	128	134	...	...
Interest Coverage	5.4	9.4	8.6	6.9	6.7	6.9	3.8	4.5
Return on Equity	13.9	19.5	16.6	14.9	10.7	13.6	...	...
Top 1-30								
<i>Memo: 22.4% of total assets</i>								
Total Liabilities/Total Equity	145	133	168	142	144	131	...	...
Interest Coverage	4.1	8.5	6.3	5.4	6.7	5.9	3.3	3.9
Return on Equity	9.2	15.5	11.8	13.0	8.5	9.5	...	...
Top 31-100								
<i>Memo: 13.2% of total assets</i>								
Total Liabilities/Total Equity	169	160	156	159	168	170	...	...
Interest Coverage	3.1	4.8	5.2	3.4	2.9	3.2	1.8	2.2
Return on Equity	6.1	11.8	10.4	10.7	9.1	8.0	...	...
Top 101-1,000								
<i>Memo: 22.6% of total assets</i>								
Total Liabilities/Total Equity	230	216	218	228	212	213	...	...
Interest Coverage	1.9	2.6	1.9	1.6	1.9	2.5	1.4	1.7
Return on Equity	7.7	10.2	8.3	7.4	7.5	9.0	...	...
Top 1,001-10,000								
<i>Memo: 14.6% of total assets</i>								
Total Liabilities/Total Equity	228	235	241	242	240	228	...	...
Interest Coverage	2.4	3.1	2.2	1.8	2.1	2.6	1.3	1.5
Return on Equity	10.0	11.7	10.3	9.0	9.0	10.4	...	...
Sources: Orbis; and IMF staff calculations.								
Note: Top Swedish nonfinancial corporations by sales, and OMX 30 nonfinancial corporate members found in Orbis. Scenario 1 represents a 250 basis point interest expense increase. Scenario 2 reflects a Lehman event where interest rates increase by 17 percent and EBIT declines by 23 percent. EBIT = earnings before interest and taxes.								

RESILIENCE OF THE FINANCIAL SYSTEM

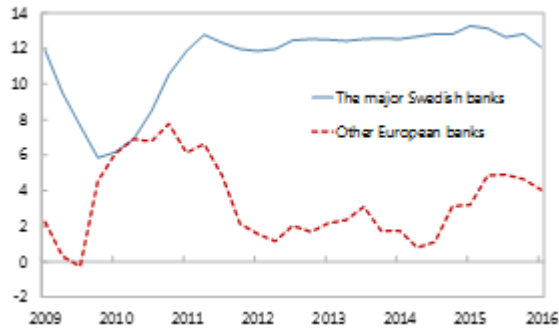
A. Banks

15. Banks have remained profitable in the negative rate environment (Figure 3 and Table 5). Their high returns on equity are primarily driven by low credit losses, low funding costs, and improved cost efficiency. Banks' net interest margin has been stable. The large share of low-cost wholesale funding has partly mitigated the impact from the zero floor on retail deposit rates. With about 70 percent of mortgages having floating rate contracts, banks re-price interest rates every three months.

Figure 3. Bank Profitability

Return on Equity

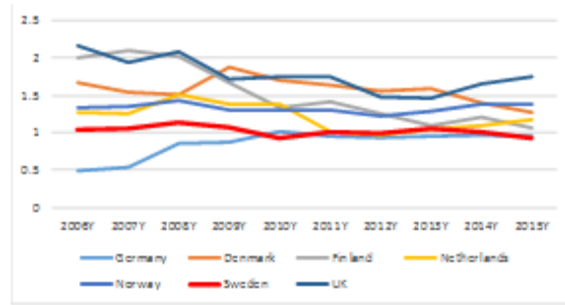
(Rolling four quarters, percent)



Source: Riksbank.

Net Interest Margin

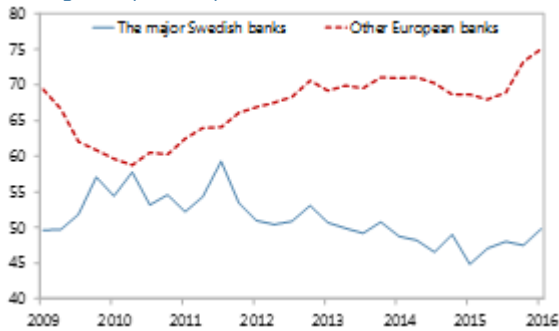
(Percent)



Source: Riksbank.

Cost-to-Income Ratio

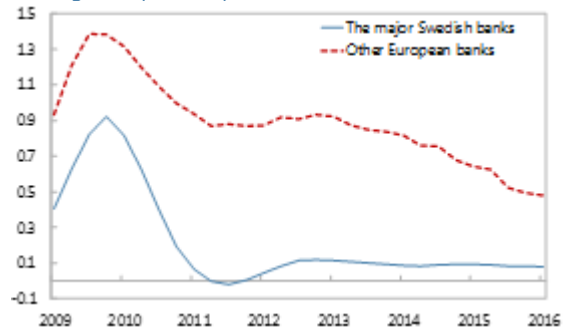
(Rolling four quarters, percent)



Source: Riksbank.

Loan Losses in Relation to Lending to the Public

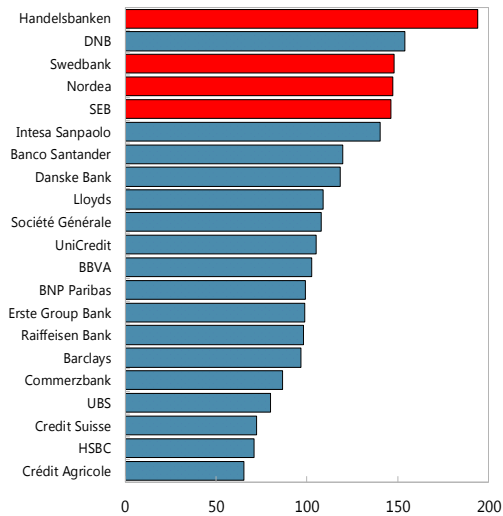
(Rolling four quarters, percent)



Source: Riksbank.

Loan-to-Deposit Ratio, March 2016 1/

(Percent)

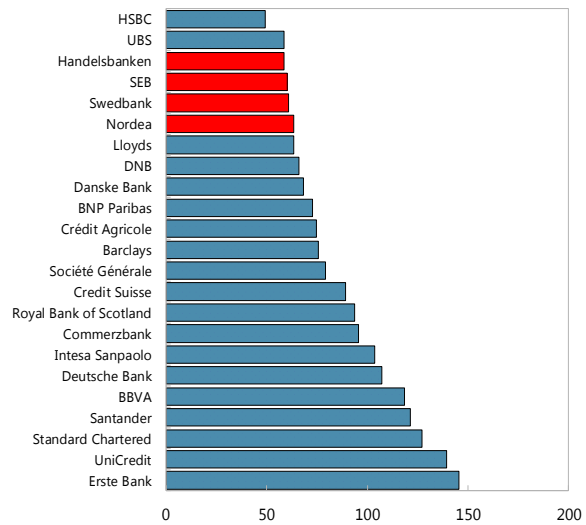


Source: Riksbank.

1/ Average over last four quarters. Nordea based on the second quarter of 2015.

Indicative Bank Funding Costs 1/

(Basis points)



Source: Riksbank.

1/ Measured as five-year credit default swap premiums and refers to the average over the last year.

Table 5. Financial Soundness Indicators for Banks

	2010	2011	2012	2013	2014	2015
Capital adequacy						
Regulatory capital to risk-weighted assets 1/ <i>of which: Four major banks 2/</i>	12.6	12.2	12.5	12.7	22.4	24.2
Regulatory Tier I capital to risk-weighted assets 1/ <i>of which: Four major banks 2/</i>	11.0	11.3	11.7	12.0	19.5	21.1
Capital as percent of assets (leverage ratio) <i>of which: Four major banks 2/</i>	4.8	4.1	4.4	4.5	5.0	5.5
	4.7	4.0	4.2	4.4	4.9	5.6
Asset quality and exposure						
Nonperforming loans to total gross loans <i>of which: Four major banks 2/</i>	1.9	1.6	1.5	1.3		
Nonperforming loans net of loan-loss provisions to capital <i>of which: Four major banks 2/</i>	9.9	9.5	9.3	8.2		
Loan-loss provisions to nonperforming loans <i>of which: Four major banks 2/</i>	44.3	41.3	39.8	38.8		
Distribution of monetary financial institutions' credit (percent) 4/ Sweden	81.3	80.9	80.1	79.3	77.8	78.0
Financial corporations	2.0	1.7	1.8	1.5	1.9	1.1
Nonfinancial corporations	31.0	31.1	30.3	29.5	28.0	27.8
Public sector	2.6	2.9	2.8	2.6	3.5	3.1
Households	45.7	45.2	45.2	45.7	44.4	46.0
Outside Sweden	18.7	19.1	19.9	20.7	22.2	22.0
Other European Union countries	9.5	9.5	10.0	10.5	12.0	12.4
Rest of the world	9.3	9.6	10.0	10.2	10.2	9.6
Large exposures as percent of tier 1 capital 3/ <i>of which: Four major banks 3/</i>	40.1	37.2	29.5	20.0	8.5	
	36.8	31.4	22.0	10.7	8.8	
Earnings and profitability						
Return on assets (net income as percent of average total assets) <i>of which: Four major banks 2/</i>	0.4	0.5	0.5	0.6	0.5	0.6
Return on equity (Net income as percent of average equity capital) <i>of which: Four major banks 2/</i>	9.8	10.6	11.4	11.4	10.2	11.4
Net interest income as percent of gross income <i>of which: Four major banks 2/</i>	52.7	54.4	55.4	55.3	50.3	50.6
Noninterest expenses as percent of gross income <i>of which: Four major banks</i>	66.2	66.1	63.2	63.9	32.0	59.2
Noninterest income as percent of total income <i>of which: Four major banks</i>	55.1	52.9	51.7	53.7		
Trading income and foreign exchange gains (losses) to gross income <i>of which: Four major banks 2/</i>	11.6	9.4	10.7	8.4	9.3	10.6
Personnel expenses as percent of noninterest expenses <i>of which: Four major banks 2/</i>	52.6	53.6	52.2	53.9	57.4	48.5
	57.4	57.8	59.4	60.5	68.5	54.0
Liquidity						
Liquid assets as percent of total assets <i>of which: Four major banks 2/</i>	4.8	6.2	8.5	8.9		
Liquid assets as percent of short-term liabilities <i>of which: Four major banks 2/</i>	44.4	66.7	97.2	95.0		
Customer deposits as a percent of total (non-interbank) loans <i>of which: Four major banks 2/</i>	47.8	49.8	52.9	53.8	56.5	52.6
Noninterbank loans to noninterbank deposits <i>of which: Four major banks 2/</i>	155.0	153.8	148.8	145.9	140.7	152.4
	165.9	163.5	158.0	153.7	149.5	165.4
Foreign exchange risk						
Foreign currency loans as percent of total loans	36.5	37.4	34.9	36.8	39.4	38.1
Foreign currency assets as percent of total assets	31.4	34.5	33.1	33.8	35.6	33.1
Foreign currency-denominated liabilities as percent of total liabilities	31.4	35.1	31.1	28.7	32.9	28.0
Exposure to derivatives						
Gross asset position in derivatives as percent of Tier 1 capital	222.3	351.2	243.9			
Gross liability position in derivatives as percent of Tier 1 capital	217.9	335.2	232.8			

Sources: Finansinspektionen; Riksbank; and IMF staff calculations.

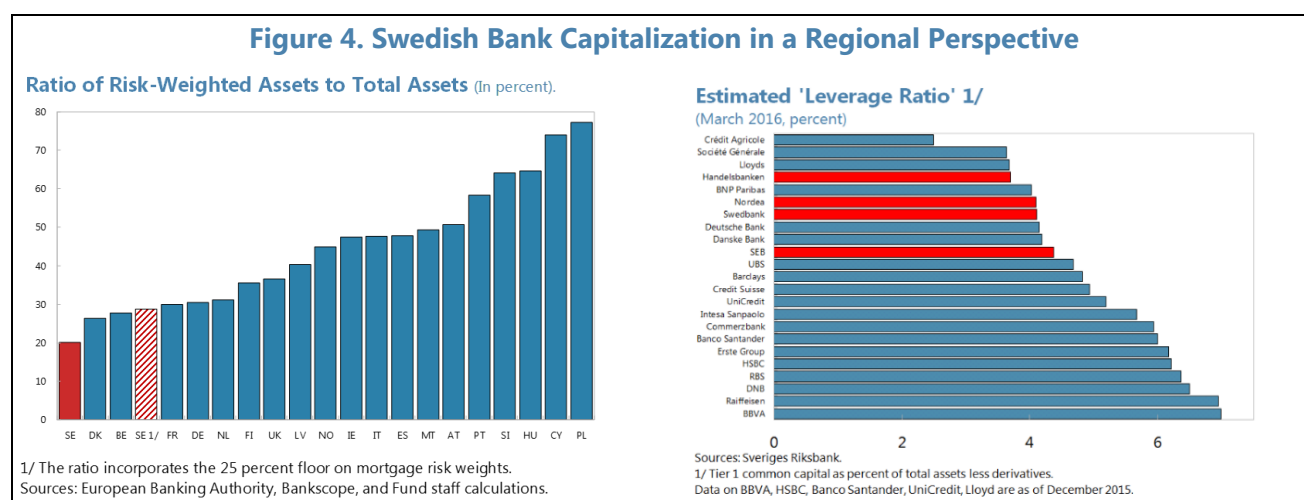
1/ From 2007 to 2013: based on Basel II, with a consideration to the Basel I-floor. From 2014: based on Basel III.

2/ On a consolidated basis.

3/ From 2010 onward, exposures to credit institutions are included.

4/ Non-consolidated data; parent banks only; monetary financial institutions include banks and housing credit institutions.

16. Banks’ risk-weighted capital ratios are high, but risk weights are among the lowest in Europe. Large Swedish banks appear well capitalized when capital ratios expressed in terms of risk-weighted assets, such as the regulatory Tier I capital ratio (Table 5), are compared with major global banks. At the same time, Swedish banks’ ratio of risk-weighted assets to total assets is among the lowest in Europe, apparently driven by banks’ use of internal rating-based (IRB) models (applied to 96 percent of bank assets) and low default rates in recent years.³ Staff estimates of Swedish banks’ ‘leverage ratios’ are below the average of European peers (Figure 4).



17. FI is working on increasing safety margins. In May 2013, the FI introduced a 15 percent floor for risk weights on Swedish residential mortgages to address IRB model risks. In 2014, the floor was raised to 25 percent as a macroprudential measure, to target risks arising from high growth rates in residential mortgage lending. In May 2016, FI announced the adoption of a supervisory approach to internal models for corporate exposures by which one of the elements is that the banks should assume that at least every fifth year is a downturn year when estimating default probabilities. Following this approach, the risk weights for exposures to corporates are expected to be at least around 30 percent for all banks.

18. Comprehensive stress tests were used to quantify the risk assessment matrix (Table 6). Top-down (TD) solvency stress tests were implemented by the FSAP team and the authorities, and results were compared with the outcome of bottom-up (BU) stress tests conducted by banks for the European Union (EU)-wide stress testing exercise by the European Banking Authority (EBA). The FSAP TD stress tests covered the largest four banks using a balance sheet approach, and the authorities ran a simpler framework based on a projection of credit losses.⁴ The tests considered two five-year scenarios: a baseline, following the IMF’s April 2016 *World Economic Outlook*; and a stress scenario, reflecting a combination of Sweden-specific shocks and spillovers from a recession in the global economy. The stress scenario entails an ‘L-shaped path’ for economic growth: a deep recession followed by slow recovery due to domestic balance sheet adjustment. The dynamics of most variables

³ For an analysis of the drivers of risk weights in Sweden relative to other European countries, see Turk, Rima: “Risk Weights in Europe: Heterogeneity, Harmonization, and Possible Determinants,” IMF Working Paper, forthcoming.

⁴ The stress tests undertaken by the team and the authorities are summarized in the Stress Tests Matrix (Appendix II).

in the first three years of the IMF's stress scenario are identical to the EBA 2016 adverse scenario for Sweden, but the interest rate and exchange rate shocks are more severe (Table 7).

Table 6. Risk Assessment Matrix ¹

Source of Risks	Likelihood ²	Impact
1. Sharp rise in risk premia with flight to safety leads to more volatile global financial conditions.		
<p>Sharp asset price adjustment and decompression of credit spreads as investors reassess underlying risk and respond to unanticipated changes in growth prospects, Fed policy rate path, and increases in U.S. term premia, with poor market liquidity amplifying the effect on volatility.</p> <p>For Sweden: Apart from the global adjustment, there is a reassessment of Swedish-specific risk, i.e. a reassessment of household risk which would translate into a reassessment of covered bonds risks. This scenario could also be triggered by a fall in housing prices. The scenario could further affect stock prices (with stocks accounting for a large share of insurance investments).</p>	Medium	<p>Renewed stress in global wholesale funding markets would led to liquidity strains for Swedish banks that rely on foreign exchange wholesale funding</p> <p>More specifically, concerns about covered bonds would impose higher refinancing risks for banks. In the face of higher volatility, banks would be constrained in their ability to post additional collateral to maintain the bonds' cover ratios</p> <p>High loss rates due to real estate collateral devaluation would put pressure on loan generation and banks' and MC's profitability.</p> <p>Mark-downs of covered bonds would hurt the solvency of banks, life insurance companies and pension funds.</p> <p>A drop in stock prices would affect insurers given that stocks are a big share of their investments</p> <p>Adverse impact could be partially mitigated by safe-haven flows.</p>
<p>Extension to Nordic countries</p> <p>The scenario above would also affect Nordic countries in which Swedish banks (such as Nordea and Handelsbanken) have extensive exposures. This regional scenario could be motivated by a surge in global volatility or by specific conditions in Nordic countries which in general are confronting weak growth prospects, rising house prices and high household debt, as a result of the search for yield. Mortgage loans are funded with covered bonds.</p>	Medium	<p>Similar effects as above are extended to Swedish banks' exposures in the other Nordic countries: 70 percent of Nordea's lending and 22 percent of Handelsbanken's lending goes to Nordic economies. Moreover, higher bank funding costs translate into higher lending rates and curtailed lending, leading to a decline in house prices in the region. Nordea is the second bank in Denmark (after Danske Bank)</p>
<p>Source: IMF staff's assessment.</p> <p>1/ The matrix shows events that could materially alter the baseline (the scenario most likely to materialize in the IMF staff's view). It reflects staff's views on the source of risks and overall level of concern at the time of discussions with the authorities.</p> <p>2/ The likelihood of risks (if the baseline does not materialize) is the IMF staff's assessment of the risks around the baseline ('low' is a probability below 10 percent, 'medium' between 10 and 30 percent, and 'high' between 30 and 50 percent).</p>		

Table 6. Risk Assessment Matrix (concluded)

Source of Risks	Likelihood	Impact
2. Structurally weak growth in key advanced and emerging economies , including the Euro Area and China.		
<p>Euro Area/Japan. Weak demand and persistently low inflation from a failure to fully address crisis legacies and undertake structural reforms, leading to low medium-term growth and accumulation of financial imbalances.</p> <p>Sweden, Nordic, and Baltic countries: Lower growth in advanced economies and in particular Euro Area would affect exports of Sweden and other Nordic and Baltic countries. This scenario is likely to be combined with low interest rates.</p>	Medium /High	<p>Weaker GDP growth and higher unemployment would increase NPL and lead to higher loan loss impairment, weighing on banks' profitability.</p> <p>Life insurance companies and pension funds would face difficulties in attracting long term savings in an environment of low interest rates; servicing contracts with guaranteed interest rates would weigh on profitability</p>
3. Economic fallout from political fragmentation in Europe , including uncertainty associated with post-Brexit arrangements, renewed surge in migration flows, and rising populism and nationalism in large economies.		
<p>The United Kingdom is an important trading partner (Sweden exports over 2 percent of its GDP to the United Kingdom).</p> <p>More generally, Sweden is a small open economy highly dependent on unrestricted movement of labor, goods and services.</p>	Medium	<p>Uncertainty during post-Brexit negotiations could weigh on confidence and investment. Renewed large scale refugee inflows would increase spending and support activity but would further strain capacity to receive and integrate migrants, raising unemployment and undermining social cohesion. Higher barriers to trade would dampen exports and investment and weaken the growth outlook. Weaker GDP growth and higher unemployment in Europe would increase NPL and lead to higher loan losses in banks with cross-border exposures.</p>
4. Significant house price decline in Sweden.		
<p>High house prices largely reflect demographic, balance sheet, and interest rate factors driving up demand faster than supply.</p> <p>Price levels remain high despite the recent moderation, but the slow reduction in supply shortfalls mitigates downside risks.</p>	Medium	<p>Large impact on consumption and employment lowers growth.</p> <p>Loan quality impacted, primarily of firms serving domestic market.</p> <p>Lending could be curtailed if doubts about the quality of covered bonds rise, elevating bank funding costs.</p>

Table 7. Stress Testing: IMF Stress Scenario

Stress scenario	2015	2016	2017	2018	2019	2020
<i>Adverse scenario</i>						
Real GDP	4078.6	4050.0	3912.2	3798.9	3874.3	3943.7
Investment	988.9	984.8	879.1	819.9	818.1	827.9
Unemployment rate	7.4	8.2	10.1	12.6	13.5	13.5
HICP index	100.7	96.8	96.5	97.1	97.7	98.5
Real house prices (1981=100)	129.2	109.0	95.9	92.0	90.8	94.6
Nominal house prices	135.4	109.4	95.5	92.1	91.5	96.1
Short term interest rate (percent)	-0.2	-0.5	-0.5	-0.5	-0.4	0.1
Long term interest rate (percent)	0.7	2.4	2.0	1.9	2.0	2.5
2-year covered bond yield (percent)	0.2	1.5	2.5	3.0	3.5	3.9
5-year covered bond yield (percent)	0.9	2.3	3.4	4.0	4.6	4.9
Equity prices	1562.5	1165.1	1210.3	1415.8	1550.8	1682.4
KIX	112.6	115.6	126.1	124.0	120.3	113.8
<i>percent changes (percent)</i>						
Real GDP growth		-0.7	-3.4	-2.9	2.0	1.8
Investment growth		-0.4	-10.7	-6.7	-0.2	1.2
Inflation (HICP)		-3.9	-0.3	0.6	0.7	0.8
Real house prices (yoy change)		-15.6	-12.0	-4.1	-1.3	4.2
Nominal house prices (yoy change)		-19.2	-12.7	-3.5	-0.7	5.0
Equity prices (yoy change)		-25.4	3.9	17.0	9.5	8.5
KIX (yoy change)		2.7	9.1	-1.6	-3.0	-5.4

Sources: IMF staff scenario and calculations; past data from the authorities.

19. The stress tests suggest that bank solvency would be resilient to severe economic distress (Figure 5). In the stress scenario, one bank would fall below the supervisory hurdle rate and no bank would breach the regulatory threshold. The credit losses would be driven mainly by losses on corporate exposures, with about two-thirds coming from non-Sweden exposures.

20. There is considerable uncertainty around capital ratios under stress. Losses produced by the FSAP stress tests and by the authorities' model were larger than those estimated by banks in the EBA exercise, resulting in lower projected capital ratios under stress.⁵ This was partially due to the inclusion of more severe interest rate and exchange rate shocks; but the authorities' models also produced much larger credit losses than banks' models, suggesting significant modeling differences.⁶ Single factor shock analysis showed that while losses due to individual materialization of severe interest, market, and concentration shocks would be manageable, increases in risk-weighted assets due to shutdown of foreign exchange swap markets would entail higher capital needs.

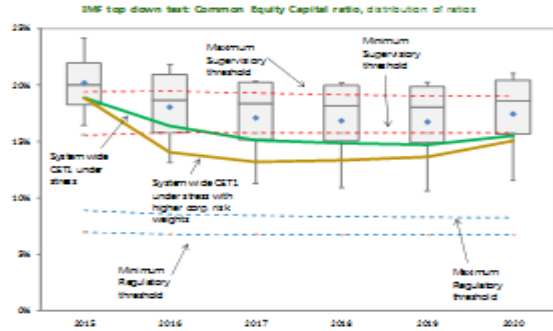
21. The contagion analysis suggests that the risk of insolvency spillovers among the four largest banks is limited, but the analysis is subject to caveats. The contagion analysis likely underestimated the spillover effects, since it did not capture all domestic interbank exposures and did not take into account the default risk outside the banking sector, including abroad.

⁵ A supplemental solvency stress test analysis was carried out using contingent claims analysis. The results are consistent with the balance sheet tests reported here (see the "Stress Testing" Technical Note).

⁶ The main difference between the IMF's and the authorities' test was the specification of the dependent variable, as discussed in the Technical Note.

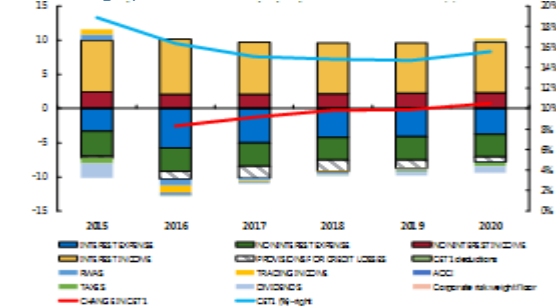
Figure 5. Stress Test Results: Bank Solvency

One bank would fall below the supervisory hurdle rate; no bank would breach the regulatory threshold. 1/
IMF Top Down Test: Common Equity Capital Ratio
 (Distribution of ratios)



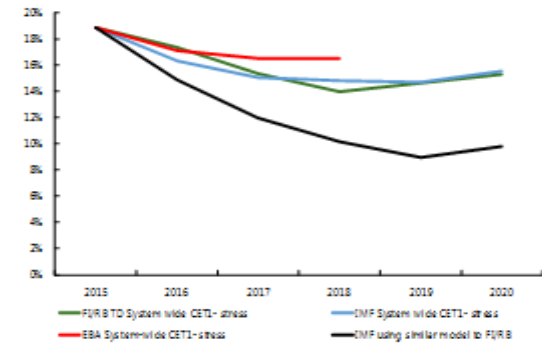
Capital ratios were driven by lower net interest income, higher credit losses and increases in RWAs.

IMF Top Down Test: Common Equity Capital Ratio, Contribution
 (Percentage points)



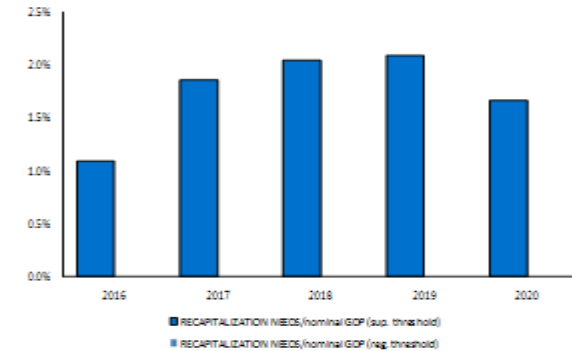
The TD tests produced lower capital ratios due to more severe interest rate and exchange rate shocks (IMF test) and large projected credit losses (authorities' test).

Common Equity Tier 1 Ratio, Stress Scenario, IMF Top Down, FI/RB Top Down and EBA Bottom Up
 (Percent)



Recapitalization needed to bring all banks to the supervisory hurdle rate would peak in 2018 at 2 percent of nominal GDP.

Recapitalization Needs
 (Percent of nominal GDP)



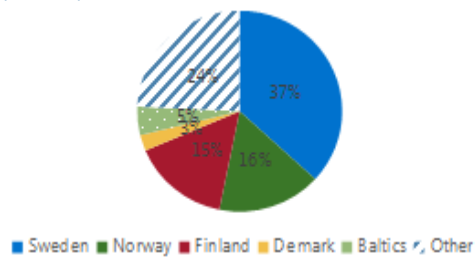
Credit losses were mainly driven by losses on corporate exposures...

EBA Bottom Up: Structure of Credit Losses by Asset Classes, 2018, Big 4 Banks
 (Percent)



...and two-thirds of losses came from non-Sweden exposures.

EBA Bottom Up: Structure of Credit Losses by Countries, 2018, Big 4 Banks
 (Percent)



Source: IMF staff calculations.

1/ The regulatory hurdle rate is defined as the Common Equity Tier 1 capital (CET1) ratio that does not include buffers and therefore includes a minimum Basel III capital requirement, Pillar 2 own-fund requirements associated with pension risk, concentration risk and interest rate risk in the banking book and the 'microprudential' capital requirements for mortgages in Sweden and Norway (15%). The supervisory hurdle rate took into account all capital buffers: 'macroprudential' mortgage floors (10%), capital conservation buffer, countercyclical capital buffer, and common equity systemic risk surcharge (5%). The box and whisker chart shows distribution of the results into quartiles, indicating the mean as well as outliers.

22. The stress tests provide a degree of comfort about banks' solvency, but modeling tail risks in Sweden is challenging. Available models may suffer from overreliance on recent historical experience and have difficulties capturing extreme but plausible scenarios, such as a combination of domestic housing market distress with global financial market turmoil, including the kind of non-linear effects that a housing market correction could imply.

23. The solvency exercise has helped identify data gaps and shortcomings in the stress testing framework. The authorities' solvency stress tests use many assumptions, especially on pre-provision income and risk-weighted assets. The mission recommends modeling approaches that would replace assumptions and allow projections of the main elements of bank balance sheets and income statements to be consistent with scenarios. As a prerequisite for the scenario-based stress testing framework, the authorities need to obtain longer time series of detailed balance sheet and income statements, and more granular data on trading and net interest.

24. To safeguard against model and measurement errors in calculating capital ratios and given the significant responsibilities of Swedish banks for financial stability in the region, the mission recommends timely adoption of a leverage ratio as a backstop. FI should promote sensitivity of bank models to tail risks and investigate drivers of risk weight variability. The leverage ratio is not meant to supplant risk-based capital ratios, but has an important complementary role in adding resilience. Unlike the risk-weighted capital framework, it does not seek to estimate the relative riskiness of assets and so can mitigate a failure to assign risk weights that reflect the true underlying risk of assets. Applied alongside risk-weighted capital requirements, it can limit incentives to reduce estimates of risk weights instead of raising capital.

25. Housing finance imposes considerable maturity transformation and refinancing risks. Sweden has one of the highest loan-to-deposit ratios in Europe (about 200 percent). Customer deposits represent only about 40 percent of bank funding, as households invest extensively in mutual funds, insurance products, and securities. The long-maturity residential mortgages rely on wholesale funding, such as covered bonds with three-year average maturity.

26. Banks could withstand funding and market liquidity shocks, but there are pockets of vulnerability beyond the 30-day timeframe. The TD liquidity tests assessed banks' resilience to short (up to 30 days) and medium term (up to one year) liquidity shocks, using the Swedish LCR,⁷ and Basel III Net Stable Funding Ratio (NSFR) on an aggregate basis and by currencies. Banks appear resilient within these parameters (Figure 6), but the maturity ladder exercise (beyond one month) shows large maturity mismatches for some banks, reflecting heavy reliance on wholesale funding in foreign exchange to finance long-term loans.⁸ Parameters consistent with a Lehman-type scenario would lead to great short- and medium-term liquidity pressures.

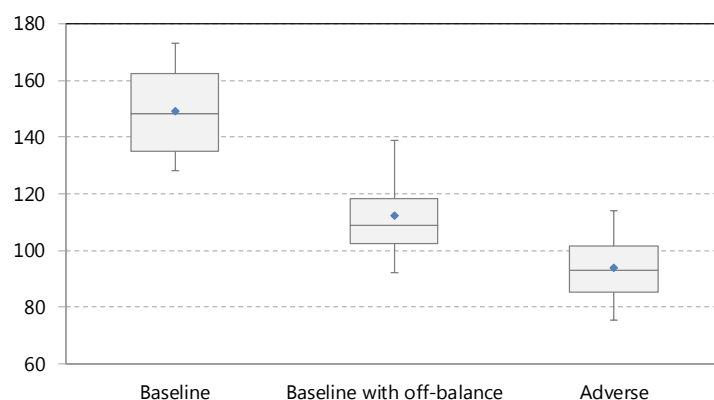
27. The mission recommends supervisory enhancements to the liquidity monitoring framework. This could include an extended LCR for the three-month horizon in U.S. dollar and euro to further strengthen banks' liquidity. The authorities should also investigate inconsistent results between compliance with the NSFR in foreign currencies and the outcome of the maturity ladder exercise.

⁷ The Swedish LCR regulations are based on the LCR originally proposed by the Basel Committee in 2010, which is more conservative than the revised proposal from 2013.

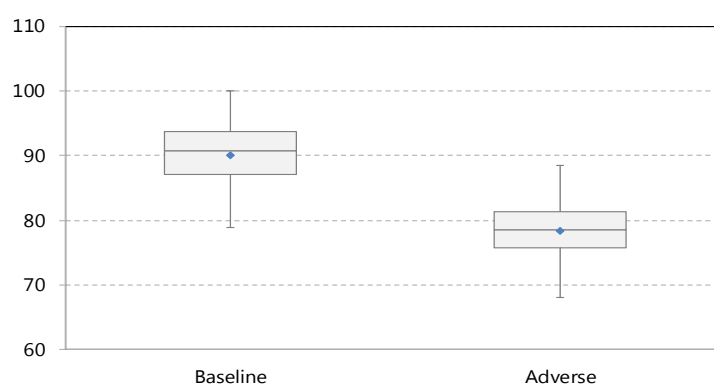
⁸ The cash flow test assessed banks' liquidity profile in a scenario characterized by outflows of at least 20 percent of funds within three months and additional 5–10 percent within next three months.

Figure 6. Stress Testing Results: Bank Liquidity

LCR, all currencies



NSFR, all currencies



Sources: IMF staff calculations based on data from the authorities.

Note: The chart shows the distribution of the results into quartiles, indicating the mean as well as outliers.

B. The Insurance Sector

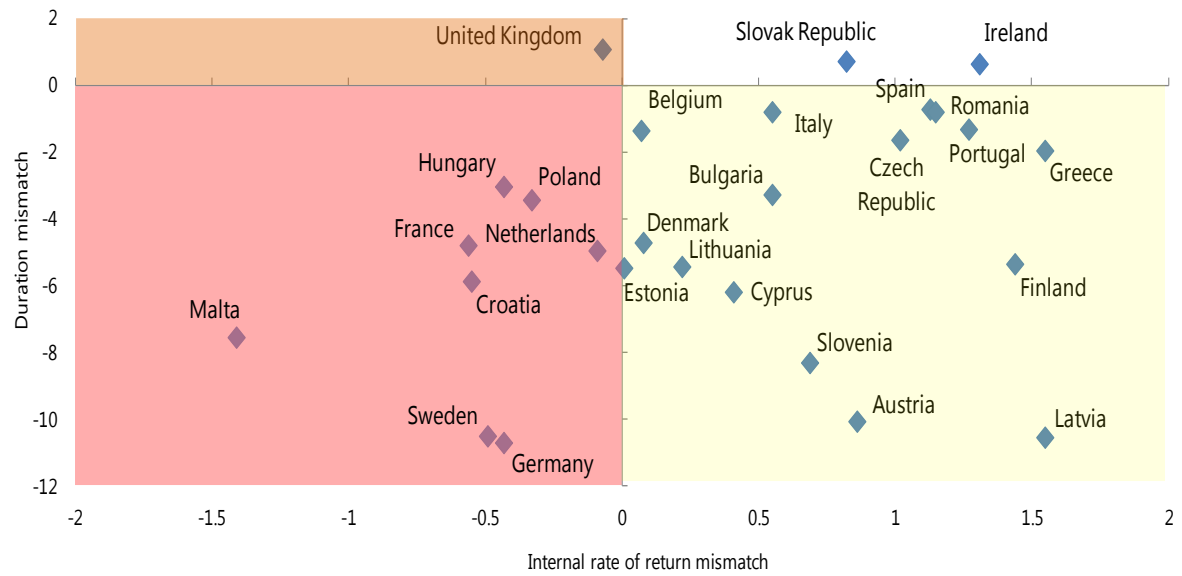
28. Low interest rates are challenging for the life insurance sector. The duration gap between assets and liabilities is among the highest in the EU. Companies have reacted by reducing guarantees for new business and increasing investment allocations to equities. Compared with European peers, Swedish insurance companies hold high equity exposures, making the sector vulnerable to a 'double hit' of a prolonged period of low interest rates and an asset price fall (Figure 7). In the nonlife sector, risks are less sizeable.

29. Insurance company stress tests indicate pockets of vulnerabilities, mainly on the asset side, but the industry seems well capitalized on aggregate and able to withstand severe price shocks. The stress test included four life and three non-life companies, accounting for 78 and 53 percent, respectively, of gross written premiums in each sector. An increase in the credit spread of Swedish covered bonds of 500 basis points could lead to a 7 percent reduction in the own funds of the median company (Figure 8).

30. The mission encourages FI to perform regular macroprudential stress tests. Scenarios should complement the Solvency II Standard Formula and the companies' Own Risk and Solvency Assessment, and incorporate a multi-period perspective. Should FI consider that the Standard Formula does not adequately capture the risk profile of a company, the need for a Pillar 2 capital add-on should be assessed.

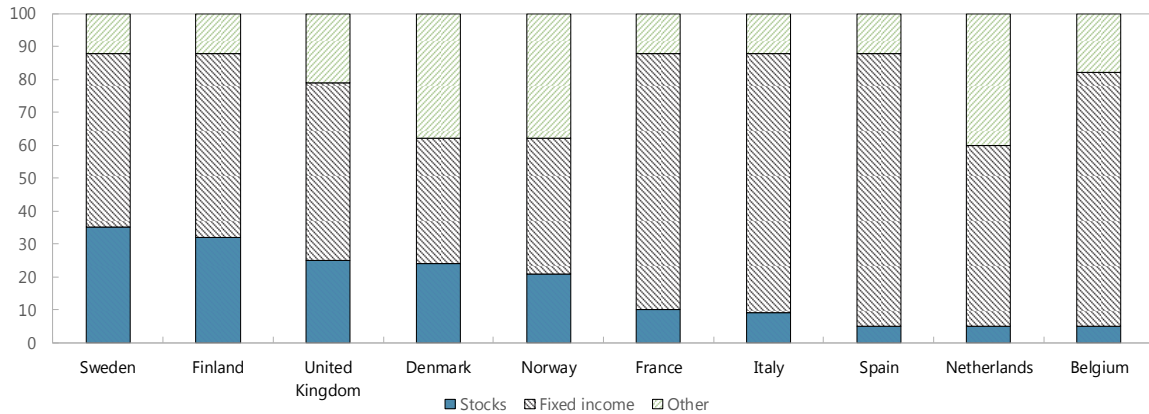
Figure 7. Insurance Companies: Duration Mismatches and Asset Allocation

Duration Mismatches and Negative Investment Spreads
(Baseline; in percent)



Source: European Insurance and Occupational Pensions Authority.

Sweden: Investment Assets of European Insurers
(Percent)



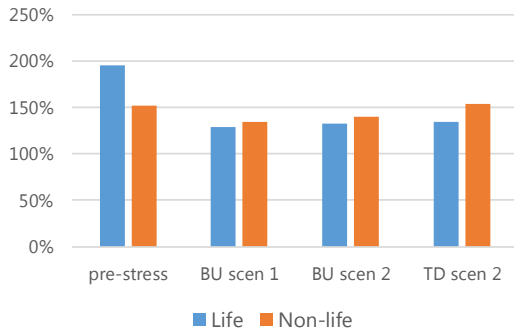
Sources: European Insurance and Occupational Pensions Authority; and IMF staff calculations.

Figure 8. Insurance Solvency Stress Tests

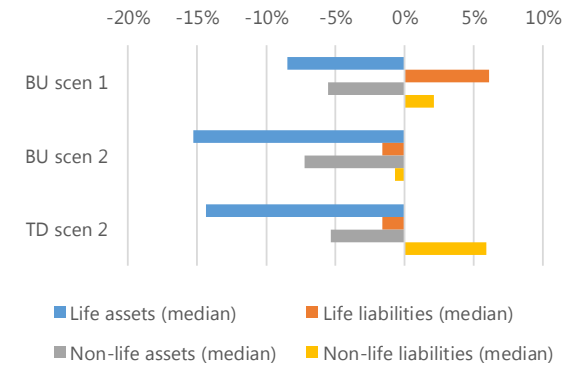
The insurance sector is well capitalized and able to withstand severe shocks on financial markets.

The stress scenario affects mostly the asset side...

Coverage of solvency capital requirement (weighted average)

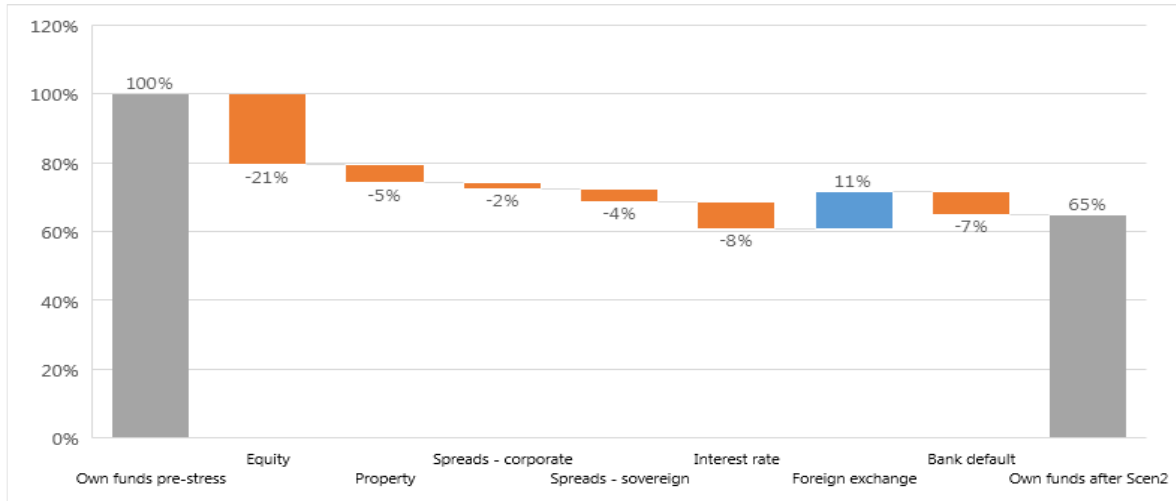


Valuation effect on assets and liabilities (compared to baseline)



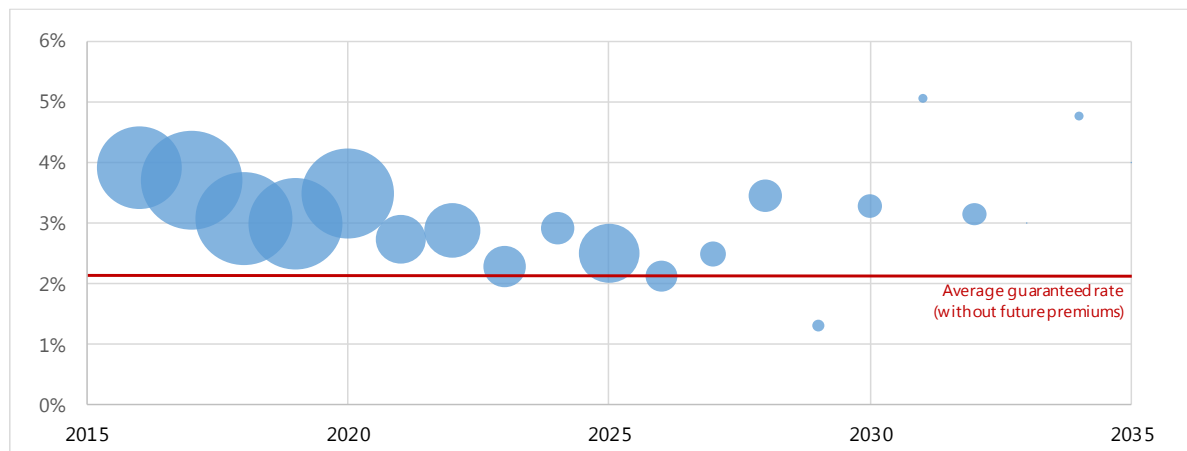
... with large effects stemming from the equity market shock and the default of the largest banking counterparty.

TD: Contribution of individual shocks



Bond investments with high coupon rates are going to expire soon, leaving insurers with significant reinvestment risks.

Average Coupon Rate per Remaining Maturity—Life Insurance
(Percent)



Source: IMF staff calculations based on data from the authorities.

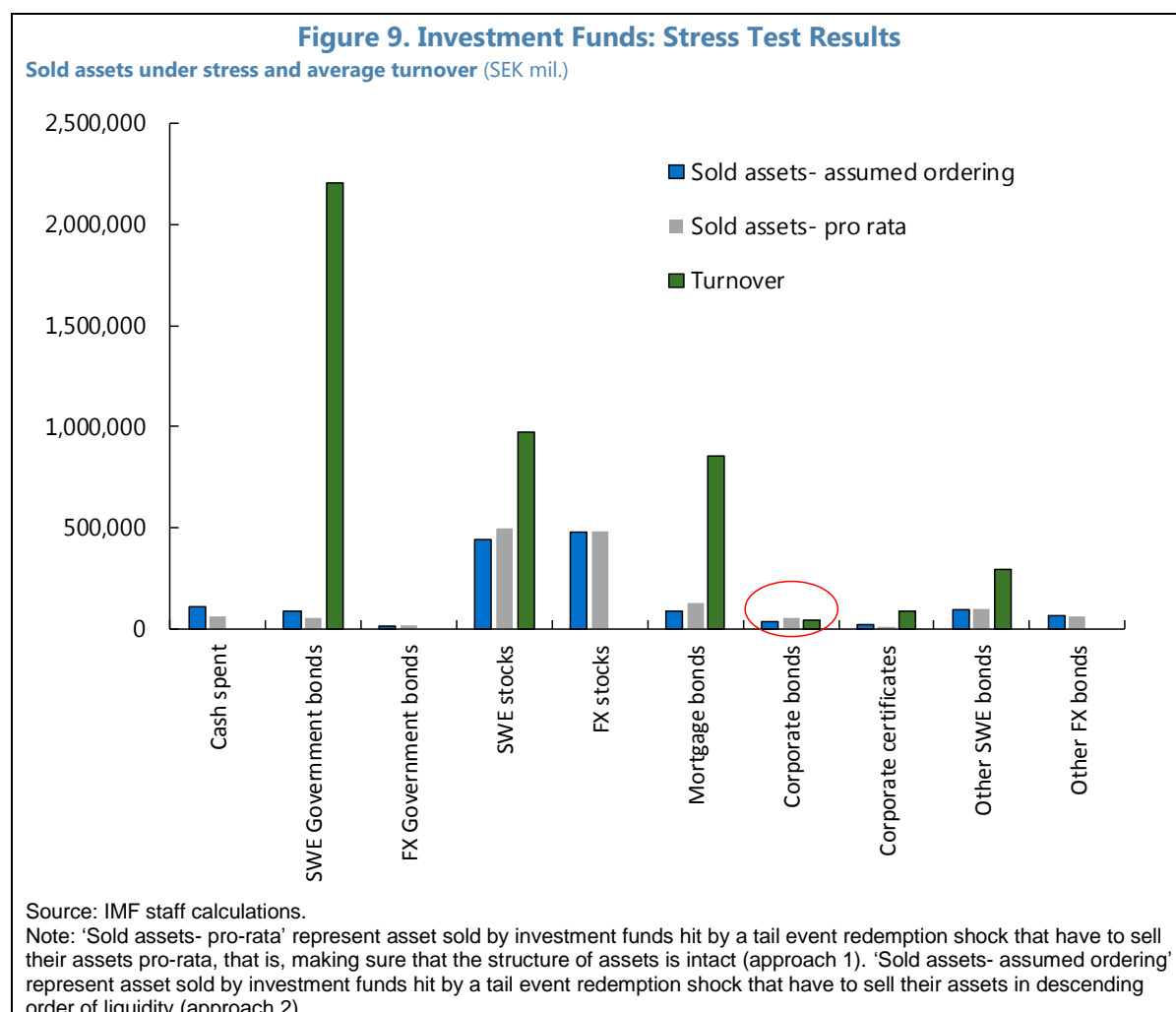
Note: Bubble size depicts the market value of expiring assets.

C. Investment Funds

31. The size of investment funds exacerbates the risks of transmission of redemption shocks in the fund industry to the rest of the economy. Total net assets have increased by 70 percent since end-2011, driven mostly by equity and balanced funds. Open-ended investment funds are exposed to redemption risk, i.e. asset liquidation that could represent a sizable shock for other institutions. While the liquidity risks for investment funds are alleviated by the existence of the Premium Pension Authority, which represents 25 percent of total assets, the redemption risk is still relevant since units redeemed and reinvested in other investment funds would probably not be invested in the same assets sold by the funds faced with outflows.

32. Stress tests suggest that corporate bonds markets are the most exposed to redemption shocks (Figure 9). The test measured whether markets would be able to absorb severe redemption pressures. Assets sold by investment funds were compared to turnover data. Parameters were calibrated based on historical distribution of redemptions. The results do not take into account that materialization of liquidity risks in other sectors would put additional pressures, and therefore it may overestimate the markets' absorption capacity.

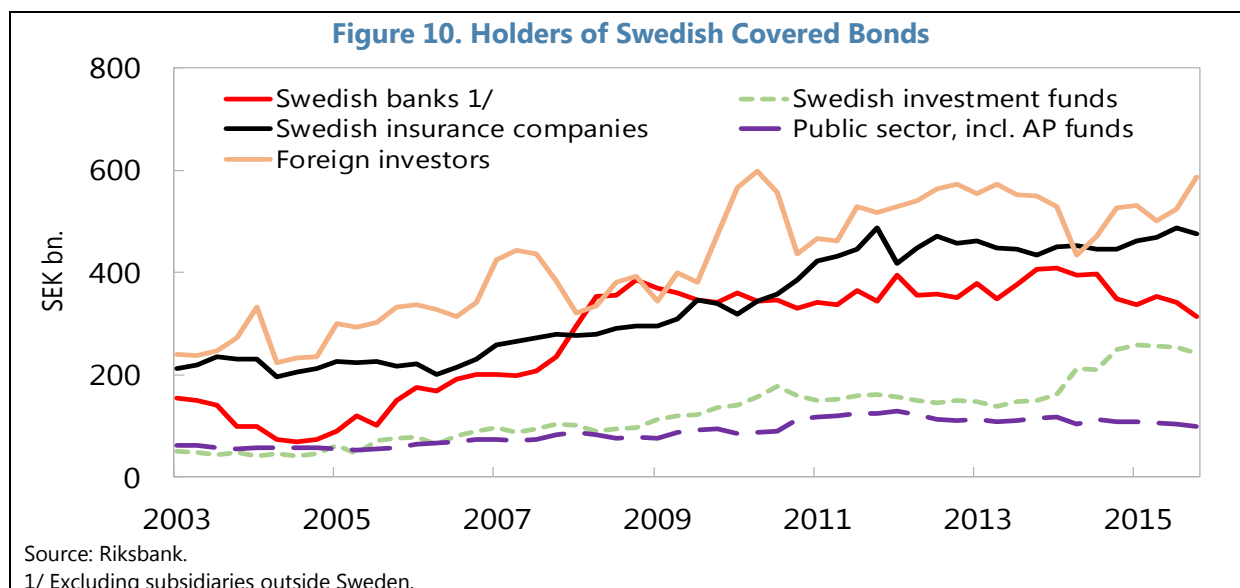
33. The authorities should develop monitoring tools to continuously assess market sensitivity to extreme mutual fund redemptions. As funds continue to grow and possibly change their structure of investments, it is important for the authorities to have in place liquidity risk analyses to examine the effects of liquidity shocks to investment funds.



D. Interconnectedness Across Institutions and Borders

34. Sweden’s responsibilities for financial stability in the region would become more pronounced after the planned conversion of Nordea’s Nordic banking subsidiaries into branches (Box 1). The Nordic-Baltic financial systems are highly interconnected through banks’ group structures, creating potential for inward and outward spillovers. Swedish banks in Finland account for 70 percent of assets. Baltic subsidiaries do not make large contributions to the groups’ assets, but Swedish banks account for the majority of financial intermediation in the region (80, 70, and 55 percent of total assets in Estonia, Lithuania, and Latvia, respectively). Nordea’s ‘branchification’ would increase pressures on supervisory resources, potential systemic liquidity needs, and the contingent liability of the Swedish deposit insurance scheme.

35. The mission recommends closer monitoring of financial interconnectedness. Banks have considerable interconnectedness via common exposures at the firm level and in the property sector. Moreover, the covered bond market has become a driver of interconnections. Among Swedish investors, it is primarily insurance companies, other banks, and funds that purchase covered bonds. The major Swedish banking groups invest in covered bonds to have buffers of liquid assets and to act as market makers. As of end-2015, covered bond holdings were equivalent to about 85 percent of banks’ equity, and Swedish banks held 28 percent of the covered bonds outstanding in 2015 (Figure 10). Liquidity in the covered bond market could be severely stressed in a systemic event, compounding banks’ risks from exposures to the housing market. The authorities should closely monitor banks’ cross holdings of covered bonds, and consider measures to further contain the potential contagion due to correlated risks.



36. Financial stability frameworks in the Nordic-Baltic region need strengthening through closer supervisory collaboration. The Nordic-Baltic Macroprudential Forum—established in 2011 to discuss financial stability risks and macroprudential policies—brings together central bank governors and heads of supervisory authorities. Although an informal body without decision-making powers, it has proved effective in allowing regional authorities to share financial stability concerns. It should continue operating with enhancements, such as (i) publishing its risk assessments and updates on macroprudential developments in the region; (ii) collecting exposure data for network stress tests among intermediaries in the region.

OVERSIGHT FRAMEWORK

A. Macroprudential Framework⁹

37. The macroprudential framework needs an upgrade. Effective macroprudential policy requires a clear mandate, well-defined objectives, adequate powers, and strong accountability. Currently, FI's macroprudential mandate rests on thin legal foundations, and the macroprudential toolkit is not fully developed. The lack of separation of responsibilities between FI and government has slowed down responses to emerging financial stability risks, as testified by the protracted debate on measures to address vulnerabilities in the housing market. The Riksbank has interpreted broadly its mandate to promote a safe and efficient payments system, but has no statutory role in macroprudential policy despite its expertise in financial stability analysis.

38. Given Sweden's choice of macroprudential framework, the law should clearly allocate the financial stability powers between the government and FI. The government should provide FI with a broad mandate and set of instruments that FI can use to address systemic risks in a timely and effective manner. This includes the ability to adopt and change instruments and their calibration.

39. The FSC's financial stability responsibilities should be strengthened by a statutory mandate and recommendation power. The RB should be given an important role in systemic risk analysis so that the FSC can fully benefit from its expertise and information on the financial system (through its payment system oversight and systemic liquidity roles). The preparatory group of the FSC should be upgraded to a Systemic Risk Committee, which would meet at a higher frequency than the FSC, with support from Riksbank and FI staff. The Systemic Risk Committee could propose to the FSC the adoption of recommendations. To enhance traction while ensuring agencies' independence, the recommendations should preferably have a 'comply or explain' attribute. The FSC should issue an annual financial stability assessment, drawing on the stability reports of its members, to provide a clearer guide to financial system stakeholders.

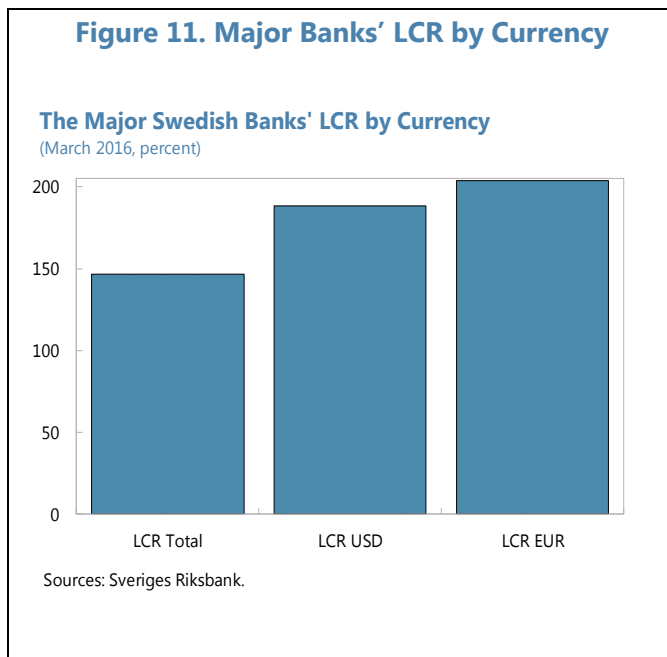
40. The authorities should enhance their financial stability analysis toolkit. They should conduct regular surveys on the distribution of households' financial assets; and improve the stress testing framework. FI should be allowed to increase the resources dedicated to systemic risk oversight and to cross-institutions supervisory issues.

B. Systemic Liquidity Management

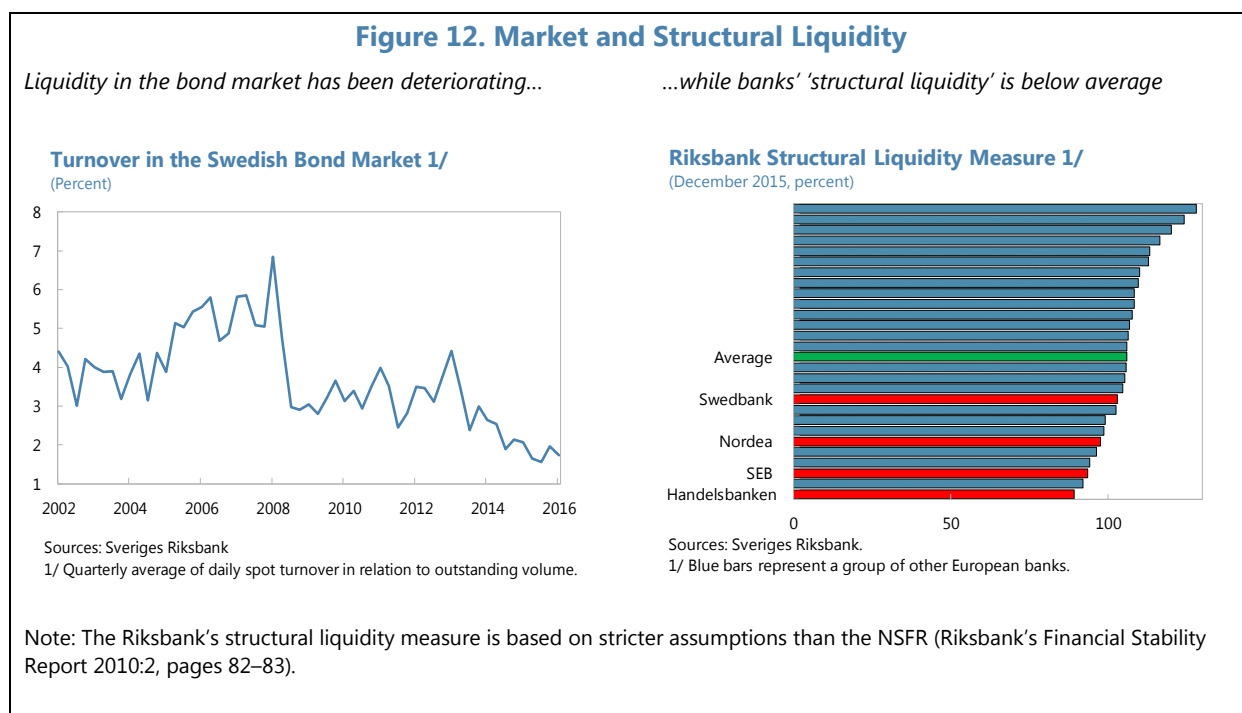
41. Banks have improved their short-term liquidity after the global financial crisis. After the Lehman Brothers collapse in September 2008, Swedish covered bonds came under heavy selling pressure. The market was subsequently calmed by a series of measures by the Riksbank and NDO, and banks started to build up short term liquid buffers. The LCR requirement of 100 percent was rolled out well ahead of the Basel timetable; in addition, the Swedish banks are required to meet LCR in euro and U.S. dollar. To date, all major Swedish banks have met the requirements, with higher LCR ratios in major foreign currencies (Figure 11).

⁹ See also the "Systemic Risk Oversight Framework and Management" Technical Note.

42. A sizable share of banks' 'high-quality liquid assets' consists of covered bonds issued by other Swedish banks, raising concerns about concentration risk. Although the Swedish definition of LCR has a less favorable treatment of covered bond holdings than the Basel LCR, covered bonds make up to 33 percent of banks' high-quality liquid assets, equivalent to about 28 percent of total outstanding covered bonds in 2015 (this includes subsidiaries outside Sweden). Recognizing the potential concentration risk, in December 2015, the Riksbank has amended terms and conditions governing collateral requirements for credit with the Riksbank.



43. The emerging signs of deterioration in the liquidity of the bond market require close monitoring. The turnover ratio for government bonds fell sharply at the onset of the global financial crisis, owing to a surge in demand for safe assets. After stabilizing at levels close to those that prevailed pre-crisis, the turnover ratio began declining from 2013, even before the Riksbank started its quantitative easing (Figure 12). At the same time, bond price sensitivity to turnover in ten-year government bonds points to a smaller deterioration in market liquidity.



44. Nordea’s planned ‘branchification’ will raise the potential needs for Riksbank’s ELA.

The Riksbank can provide unlimited Swedish krona to the banking system, but liquidity injections in foreign currencies require a foreign exchange buffer. Swedish banks had short-term external debt equivalent to about 50 percent of GDP at end-2015. Conversion of Nordea’s subsidiary banks in the region into branches would add an amount equal to a further 25 percent of GDP. The Riksbank will have the responsibility to provide ELA to all Swedish banks, including their branches outside Sweden. Despite their solid short-term liquidity buffers, the major Swedish banking groups (including regional subsidiaries) have lower ‘structural liquidity’ compared with other European banks according to the Riksbank’s measure (Figure 12).

45. The authorities should ensure appropriate foreign exchange buffers. The mission recommends that the Riksbank seeks to establish swap agreements with central banks in the Nordic countries, the Fed and the ECB.

46. The need for foreign exchange buffers could also be contained by further strengthening banks’ foreign exchange liquidity. Over a one-month period, the Swedish banks have ample liquid buffers in euro and U.S. dollar, indicated by high LCRs. Yet, the maturity ladder exercise finds that the banks need to seek foreign currency if the funding stress lasts longer than one month. Monitoring an extended LCR, beyond the ELA one-month horizon, could further strengthen banks’ liquidity and reduce potential ELA needs. The ongoing work on MoUs among the Nordic central banks may help the Riksbank to access Norwegian and Danish kronor liquidity, suggesting that the extended LCR should focus on euro and U.S. dollar.

C. Banking¹⁰

47. FI has made progress since the 2011 FSAP with supervisory approaches and techniques. Structured risk assessments for the four large banking groups have been rolled out and FI’s independence has been strengthened, but gaps remain.

- The roll-out of FI’s Supervision Strategy addresses one of the major findings of the 2011 FSAP, namely the lack of a formalized analytical framework to assess the risk profiles of supervised institutions. A number of gaps in the prudential framework have been addressed through a combination of EU legislation and regulation, and domestic regulations. However, significant gaps remain. Implementation of EU-wide requirements has improved the granularity and frequency of reporting by supervised institutions.
- FI reports that its independence has been strengthened, and it is better able to allocate resources and set its own priorities within the overall budget ceiling set by the government. The authorities have chosen not to proceed with recommendations to enhance the legal protection for supervisors, expand the remedial powers available to FI, and require fitness and probity reviews of members of senior management. They view the first two points as being adequately addressed within the existing framework, and the third as inconsistent with Swedish law, which does not recognize the concept of senior management.

48. A major challenge is that FI continues to be under-resourced relative to the size and complexity of the supervised system. Bank supervision has less than 100 staff to supervise

¹⁰ See also the “Banking Regulation and Supervision” Technical Note.

124 institutions, including one G-SIB. The result is limited analytical capability, too few examinations, and over-reliance on a small number of key people. The FSAP reviews in 2002 and 2011 both raised concerns about the adequacy of supervisory resources, given such a large banking sector. Since the last FSAP, FI's banking supervision staff has increased. However, it remains under-resourced. Moreover, given new demands, including the prospective conversion of Nordea's Nordic banking subsidiaries into branches, resources will be even more stretched. The lack of experienced bank supervisors also substantially weakens supervisory capacity.

49. FI may issue regulations only in areas specifically vested by a law or ordinance, resulting in long delays in regulations. Swedish law requires the power to issue regulations to be specifically vested in an authority. 'Catch-all' provisions may only be used to issue non-binding policy guidance. In several instances, such as the issuance of credit risk standards, introduction has been delayed by several years awaiting amendment of the law or ordinance to provide the specific power required. The mission recommends giving FI a general power to issue binding regulations on safety and soundness issues.

D. Insurance¹¹

50. Solvency II has brought higher standards of regulation, but is not being applied in full, on a mandatory basis, to occupational pensions insurance. Solvency II has brought improvements in regulatory reporting and group supervision, as well as higher overall solvency coverage. However, the requirements apply in full across only some 40 percent of the life insurance market. Sweden has allowed firms to exclude occupational pensions insurance from the application of the main solvency provisions of the framework. The mission recommends that the authorities resolve as soon as possible the uncertainties over the approach to regulation to be taken following the end of the transitional period in 2019; and that whatever regime they choose for after 2019, they ensure the same level of protection to occupational pensions as to life insurance.

51. The supervisory framework should be strengthened. FI is implementing an approach to supervision based on a well-articulated risk assessment framework. The mission recommends that FI overlay the risk-based allocation of resources with minimum supervisory staffing levels, an extended range of minimum supervisory activities for the highest impact entities and increased resourcing of the teams addressing the highest risk companies.

52. The mission noted that FI's approach to consumer protection work would also benefit from increased resources as well as a broader mandate. FI's new and separate consumer protection function has equipped it better to identify and address risks to consumers. Its agenda includes major issues such as the future of commissions-based remuneration. A broader mandate from government would avoid the need for FI to seek mandates in respect of new areas of focus, with the delay this can entail.

E. Securities Markets¹²

53. FI's Consumer Protection and Markets Areas have the primary responsibility for regulating and supervising securities markets. Their staff currently totals approximately 140, some of which are however responsible for other activities. Markets Area is subject to

¹¹ See also the "Insurance Sector Regulation and Supervision" Technical Note.

¹² See also the "Regulation and Supervision of Cross-Border Securities Activities" Technical Note.

extraordinarily high staff turnover, reaching 28 percent between January 1 and November 30, 2015.

54. FI should review the Consumer Protection Area's activities to assess where the current consumer protection angle should be complemented with explicit consideration of financial stability risks. While FI's objective of promoting the financial system's stability and efficiency also guides Consumer Protection Area's planning, the emphasis continues to be on consumer protection. This may no longer be appropriate given the increased financial stability risks arising from certain securities markets activities, in particular fund management.

55. Greater data availability and quality and better analytical tools would improve FI's ability to analyze risks and plan its supervisory activities. Solving the current reporting challenges is a precondition for building sufficient tools to conduct regular and ad hoc analyses to target supervisory activities and assess financial stability risks. To help address these challenges, authorities are encouraged to cooperate in data collection and analysis. To effectively supervise cross-market and cross-border trading in the current fragmented trading environment, FI should also acquire an automated market surveillance system.

56. Wider communication of inspection findings and recommendations is important to enhance the effectiveness of FI's current supervisory program. FI is encouraged to develop additional tools to communicate the general findings and recommendations of its thematic inspections to all supervised entities and, where relevant, to the public.

57. Enhancements to cross-border supervisory cooperation and active participation in the work of the European Securities and Markets Authority are necessary complements to FI's current active domestic supervisory program. It is important to continue to build closer cooperation with FI's key foreign counterparts, in particular in the Nordic region and Luxembourg. FI should actively raise issues for discussion at European Securities and Markets Authority to enhance EU level convergence to avoid regulatory arbitrage. This is important given the increased ability of fund managers, funds and investment service providers to choose their domicile within the EU.

F. FMIs¹³

58. There is room to enhance arrangements for FMI crisis management. FMIs are well developed, and subject to minimum regulatory requirements established in relevant international standards. However, there is overlap in the supervision and oversight by FI and the Riksbank. Arrangements have been established to facilitate cooperation. There is evidence that the authorities speak with one voice where relevant, but FI and the Riksbank should clarify how they would coordinate during a (non-resolution) crisis, possibly by establishing a joint crisis management plan.

59. Risk management at Nasdaq Clearing appears to be sound, but it does not have a comprehensive and well-developed recovery plan to ensure critical services in times of crisis. It should also have the ability to comprehensively address credit losses and liquidity shortfalls. All recovery tools must be backed by formal agreements or be in the rulebook, as appropriate. FI and the Riksbank have recognized the need for further development, and Nasdaq

¹³ See also the "Supervision and Oversight of Financial Market Infrastructures" Technical Note.

Clearing has begun work in this area. EU legislation, expected to be introduced in late 2016, should provide additional certainty and ensure that authorities have enforcement powers.

60. The mission encourages FI and the Riksbank to continue reviewing the adequacy of resources for FMI oversight and supervision. Effective cooperation helps alleviate pressures but international policy work and increasing demands in other areas can increase pressures. Additional resources will also need to be devoted to work on FMI crisis management when EU legislation on central counterparty resolution is introduced.

61. The mission recommends that FI and the Riksbank clarify how the two authorities would coordinate in a crisis. This should involve establishing a joint crisis management plan. Further work will be required when the EU legislation regarding central counterparty resolution is implemented, possibly with a wider range of authorities.

G. Financial Integrity

62. Sweden has made significant progress in addressing deficiencies in its financial integrity regime, but improvements to the anti-money laundering/combating the financing of terrorism (AML/CFT) framework could enhance its effectiveness. Since the 2006 assessment,¹⁴ the authorities have strengthened the legal framework, covered national and sectoral money laundering/terrorist financing risk assessments, and developed a national AML/CFT strategy. Nevertheless, important shortcomings remain (e.g., low risk customers are completely exempt from customer due diligence requirements, identification and verification of beneficial owners could be improved, and suspicious transaction reports from specific sectors are of low quantity and quality). The authorities should improve their understanding of money laundering/terrorist financing risks and enhance cooperation on AML/CFT among stakeholders. Addressing the customer due diligence exemption, establishing a register of beneficial ownership through legislation, and providing feedback to reporting entities on improving suspicious transaction reports will contribute to the overall effectiveness of the AML/CFT regime.

CRISIS READINESS, MANAGEMENT, AND RESOLUTION¹⁵

63. The authorities have addressed key recommendations of the 2011 FSAP. They held a crisis simulation exercise in late 2014 while a new crisis simulation exercise is under preparation. In mid-2011, they revised the deposit insurance scheme through implementation of EU directives, including the FSAP recommendations to shorten the payout period and to redefine the payout trigger,¹⁶ and in early 2016, they vested the National Debt Office with resolution authority and established a bank resolution regime by implementing the EU's Bank Recovery and Resolution Directive (BRRD).¹⁷

¹⁴ The Financial Action Task Force is assessing the AML/CFT regime under the revised standard, and is expected to finalize its report in 2017.

¹⁵ See also the "Financial Safety Net and Crisis Management" Technical Note.

¹⁶ The deposit insurance scheme appears well-funded, at more than twice the EU target level, although the contingent liability may increase with Nordea's 'branchification' (Box 1).

¹⁷ After concluding the public consultation, the NDO aims to adopt its policy on minimum requirements for own funds and eligible liabilities (MREL) in Q4 2016 when it also expects to take the first MREL decisions when adopting resolution plans for the four cross-border banks. Meanwhile, it has set MREL equal to required capital.

64. The overhauled framework is untested, and further investments are needed to be able to rapidly deploy recovery and resolution tools. Establishing a new framework requires additional resources, including for a new resolution handbook to operationalize the resolution toolkit, an updated early intervention manual to ensure consistency with the BRRD, and the first recovery and resolution plans for all 200 banks and investment companies. Even though there are no official metrics to assess the needs for recovery and resolution staffing, FI and NDO appear understaffed when benchmarked against other EU countries' agencies, particularly in light of Sweden's home-country responsibilities.

65. The introduction of the special bank resolution regime requires a smooth transition from early intervention by FI to resolution by the NDO. The new regime also underlines the importance of close cooperation between FI, NDO, and the Riksbank in assessing the solvency and viability of institutions receiving ELA from the Riksbank, particularly during resolution. Existing MoUs between the agencies should be updated. As the home country for one G-SIB and three other major cross-border banks, Sweden will need to rely on comprehensive bi- and multilateral cross-border arrangements to ensure effective recovery and resolution including of systemic Swedish bank branches. The mission recommends that a revamped Nordic-Baltic Stability Group could oversee cross-border crisis preparedness and management.

66. The mission recommends clarifying the Riksbank's financial stability mandate and related powers to provide liquidity assistance. Riksbank's financial stability mandate should include a clear role in the oversight of systemic risk and explicit confirmation of statutory authority to extend ELA for financial stability purposes to individual institutions ('idiosyncratic ELA') and the system as a whole ('systemic ELA'). The mission recommends that a special clause be introduced in the Riksbank Act and that strategies be defined to provide liquidity to banks in resolution. To strengthen the Riksbank's ability to provide ELA in foreign currencies—should the Riksbank's foreign exchange reserves be insufficient—the mission recommends that the Riksbank seek swap agreements with central banks of jurisdictions where Swedish banks operate through branches. To further protect the Riksbank's balance sheet against potential exposures due to ELA, the mission recommends that the authorities consider complementary ex ante, standing indemnification and guarantee arrangements for any ELA losses if incurred by the Riksbank without subjecting each ELA operation to ad hoc approval from third parties. This will be crucial for promoting the Riksbank's financial and operational autonomy.

67. The responsibility to actively oversee national contingency planning, including national and cross-border financial crisis simulation exercises, has not been assigned; nor is there a national contingency plan. The mission recommends that this be addressed by expanding the FSC's mandate, which will also require that the supporting preparatory group and FSC secretariat include contingency planning expertise. The FSC would remain a platform for inter-agency coordination and the agencies would continue to use their powers within their mandate.

Box 1. Proposed Conversion of Nordea's Nordic Banking Subsidiaries to Branches

In May 2016, Nordea, the largest financial services group in Northern Europe, with assets of about EUR 650 billion, received approval from Sweden's FI to convert its Danish, Finnish, and Norwegian subsidiary banks to branches of its Swedish bank. These subsidiary banks are currently supervised by the national authorities in Denmark, Finland, Norway, and the ECB.

The majority of Nordea's funding is wholesale, and most of its balance sheet is in currencies other than SEK. Nordea's assets are equivalent to 140 percent of Sweden's GDP. The Financial Stability Board has designated Nordea as one of 30 G-SIBs based on Nordea's cross-border presence in the Nordic region and its dependency on wholesale funding. As a G-SIB, Nordea should be subject to more intensive and effective supervision, commensurate with the potential destabilization risks that G-SIBs pose to their domestic financial systems, as well as the broader international financial system.

Nordea is awaiting approval from authorities in the other three countries before it proceeds. If it does go forward, it will significantly increase Sweden's financial stability responsibilities within the region. Under the EU Fourth Capital Requirements Directive (CRD-IV), virtually all authority for the supervision and resolution of international branches is assigned to the home competent authority. As a result, absent an agreement with the other Nordic countries and ECB to share resources, Sweden's FI will need to assign its supervisors to take the place of the Danish, Finnish, Norwegian, and ECB supervisors, who will no longer be responsible for the supervision of the Nordea operations in their respective jurisdictions. The Riksbank will become Nordea's primary central bank, and the Swedish government will become the primary deposit insurer and be responsible for any potential resolution. Supervisors in Denmark, Finland, Norway and at the ECB expressed concerns that while CRD-IV anticipated that some international branches may be significant in host countries, it had not anticipated branches that are among the top three or four banks and impose systemic risks on host countries.

The Riksbank, in comments on the proposed conversion, pointed out Nordea's cross-border operations and its size relative to the Swedish economy. It recommended that the Swedish FI impose liquidity coverage ratios on Nordea in Danish and Norwegian kronor, be given additional resources to carry out its expanded responsibilities, and be given clear authority to implement macroprudential measures consistent with those in the other countries. It also suggested tightening capital requirements of the four major Swedish banks.

The NDO's view was that the risk to the state is not greatly affected by Nordea's plans. The NDO thought that although the reorganization would extend Sweden's formal liability for deposit guarantees and resolution, the increase in the sovereign's financial commitments would be limited. The NDO pointed out that the new arrangements for handling a banking crisis applied since February 2016 mean that costs of resolution are mainly borne by the bank's owners and lenders. In NDO's assessment, the 'branchification' could mean an improvement in the conditions for effective and orderly handling of a crisis.

The Swedish FI, in its decision granting Nordea Bank AB the authorization to execute the merger plans,¹ concluded that Nordea's transformation would not significantly increase risks to public interests, nor would it impair the conditions for handling a crisis, or that the Swedish State's potential commitments would be significantly increased. FI did not see an increased risk of a serious disruption in the payment system or the manner in which the capital market functions. At the same time, FI thought that it may be relevant to apply a temporary own funds requirement to address the risks during the transition period. FI has committed to carefully monitoring Nordea Bank AB's contingency plans for liquidity and funding, conduct more frequent and comprehensive supervision, and, if necessary, widen the scope of the bank's reporting.

It is crucial that the relevant supervisors, central banks, and ministries of finance work on agreements that should ease some of the concerns of the host countries and ECB, while providing support to Sweden if it is to take on these additional responsibilities.

¹ http://www.fi.se/upload/90_English/20_Publications/20_Miscellaneous/2016/beslut-bilaga-nordea-16-maj-2016-eng2.pdf

Appendix I. Follow-up on the 2011 FSAP's Key Recommendations

Recommendation	Status
Establish a high-level FSC	<p>An agreement between seven parties in the Swedish Parliament on the principles of the macroprudential framework was reached in 2013. On the basis of that agreement, the government decided to appoint FI as the Swedish macroprudential authority and establish the FSC. The FSC became operational in the beginning of 2014. The FSC is a forum in which representatives of the government, FI, the NDO, and the Riksbank regularly meet to discuss issues of financial stability and how financial imbalances can be counteracted. Should a financial crisis arise, the FSC would also function as a forum for the discussion of possible measures for handling the crisis. The government and the agencies represented on the FSC decide independently what measures to take in their areas of responsibility.</p> <p>Implemented, but further steps needed</p>
Monitor closely the performance of mortgage loans	<p>FI is required to present a biannual stability report, as determined in the government's appropriations letter. To follow the developments on the Swedish mortgage market, FI produces an annual mortgage survey, which includes micro data on household level. In addition, data on the aggregate level is also collected. The data allows FI to follow the development in indebtedness for new borrowers over time. FI also assesses changes in amortization behavior and do stress tests of household resilience to economic shocks. Household indebtedness is regarded as a systemic issue by the Riksbank and FI. The issue is thoroughly monitored at both authorities and various publications have been released on the subject since 2011.</p> <p>Ongoing</p>
Collect and monitor on a regular basis loan default rates and NPLs by sector and geographical allocation	<p>The government has addressed this by assigning FI to assess it in its biannual stability report on overall financial stability, with a focus on the state of the financial markets and the economic situation of households, nonfinancial companies, credit institutions, securities companies, and insurance companies. The stability report should include a description of credit lending and credit conditions to businesses, broken down into small- and medium-sized enterprises, and to households. The report should also make an assessment of financial imbalances that may affect the supply of credit and the demand for credit and describe the action taken—and actions that can be taken—to counter these imbalances and the effects of the measures are expected to have on the economy. Each quarter, FI collects and monitors loan default rates and NPLs by sector and geography through the European reporting frameworks (Corep and Finrep). In connection with the Risk Assessments conducted under the Supervisory Review and Evaluation Process, FI analyses and compares the development of NPL and past due loans between banks and across geographies and portfolios.</p> <p>Implemented</p>

Recommendation	Status
Increase FI's resources to ensure effective supervision	<p>Since 2011, the appropriation to FI has increased substantially. In the budget proposals for 2012–2014, it was stated that FI's resources needed to be gradually reinforced, and FI was therefore assigned in total SEK 103 million for that period. For the period of 2014–2016, an additional appropriation of SEK 100 million has been granted. The reason for the additional funds is the increased demands on FI in relation to its supervision and consumer protection assignment. As shown in the diagram below, the appropriations have increased substantially, from SEK 284 million in 2010 to SEK 491 million in 2016. The additional funds have been used to increase resources especially in the banking, consumer protection and macro analysis areas. Significant resources have also been devoted to development of systems needed due to new legislation and reporting requirement following for example the EU Capital Requirements Regulation. The need for development of new systems is expected to continue. The increase in resources for FI since 2011 has led to an increase in time on supervision. The resources have also been necessary for FI to be able to participate actively in both the development and implementation of new legislation. During this period FI has also been given new tasks, such as the responsibility for macroprudential supervision and the supervision of new categories of companies. Furthermore, the level of expectations in regulation and supervision at the EU and international level has increased.</p> <p>Implemented, but further steps needed</p>
Enhance the operational independence of FI in discharging its supervisory responsibility by, inter alia, redefining the function and nature of the appropriations letter	<p>In 2013, the ordinance that details FI's specific objectives, assignments and responsibilities was changed and FI's independence strengthened. Thereby, the operational independence of FI was enhanced, and it now has more independence in setting its own priorities and work program within its legal mandate. As was the case already in 2011, no public authority, including the parliament, may determine how an administrative authority should decide in a particular case relating to the exercise of public authority vis-à-vis an individual or relating to the application of law.</p> <p>In addition, by Government Bill 2012/13:95, the ability of the government to assess and judge issues of authorization of bank and insurance activities has been removed. Thus, it is now only FI that has the ability and mandate to authorize institutions. The government's reason for the change is an assessment that the government's decision-making authority in such matters is no longer motivated. Authorization of a credit institution should be based on certain specified conditions being met. The assessments that may arise during the authorization process are not of such nature that they require involvement by the government. The government's decision-making competence in such matters was therefore removed, and issues of authorization are now handled entirely by FI. That position was supported by the fact that no such cases had been referred to the government for assessment since 2001. The changes in the bill therefore established a legal base for practices already applied.</p> <p>The appropriations letter for FI has become substantially shorter compared to 2010. The amount of times it has been issued each year has varied over</p>

Recommendation	Status
	<p>the years, but changes during a year have only concerned marginal issues which cannot be said to have had any effect on FI's possibility to discharge its supervisory function or setting priorities.</p> <p>In general, changes have concerned specific assignments for FI, such as the production of a specific report. No changes have led to a significant reduction in resources. That the appropriations letter is reissued during the year when FI receives an assignment is a matter of ensuring transparent instructions to the agency as well as accountability for the government. It is a fundamental principle of the Swedish state budget, to ensure parliamentary control that fees collected by a government agency are not to be used directly by that agency. This is regulated in the Budget Act. Based on an exception in the Budget Act, FI does dispose of certain fees from different kind of applications as these are directly intended to cover the costs associated with the applications.</p> <p>Implemented, but further steps needed</p>
<p>Broaden the scope of FI's discretion in issuing binding secondary regulations in the insurance sector</p>	<p>The new Insurance Business Act (SFS 2010:2043), which came into effect in April 2011, provided FI with a wider mandate to issue regulations in the areas of solvency, liquidity and risk management based on broad principles through amendments in Chapter 4, section 18. Similar principle-based approaches have been made, for example the changes to Chapter 1, section 23 of the Insurance Business Act, which came into effect in January 2016, which provide FI with a wide mandate to issue regulations concerning minor insurance companies.</p> <p>Implemented</p>
<p>Enhance crime prosecution in the securities market sector including for insider dealing and market manipulation</p>	<p>In January 2012, the Swedish Economic Crime Authority established a Financial Markets Chamber (FMK). By establishing a specialized public prosecution chamber for financial market offences, the authority aimed at strengthening its governance and management, to develop its working methods and to enhance staff skills in the area of financial markets offenses. The dominating type of offences handled by FMK is insider dealing and market manipulation, but the Chamber also investigates and prosecutes swindling in listed companies. The operations at FMK are exclusively dedicated to financial market offences. The specialization in combination with a dedicated financing has increased the level of knowledge concerning these offences. Since FMK was established, its investigation methods have improved, the use of coercive measures has increased, the cooperation with market places and FI has improved and the processing times have been shortened. FMK prosecutors have in their own processing in courts, by referring to EU legal acts and EU court decisions as a complement to national legislation, been able to clearly illustrate how the concept of insider information should be interpreted. It is also evident from recent Swedish insider judgments that Swedish courts have also begun to take EU law into account to a greater extent than previously. Due to of the increased level of expertise in financial markets of investigators and prosecutors, more links between atypical trading and persons in possession of insider information</p>

Recommendation	Status
	<p>have been detected. This has in turn led to investigations becoming more extensive. Collaboration between FMK, FI and other actors in the financial markets has been improving. Collaborative meetings between FI and the Swedish Economic Crime Authority have been held and the forms of cooperation have developed. Since January 2015, the forms of collaboration have been formalized in an MoU between the two authorities. Pursuant to the MoU, FI and the Swedish Economic Crime Authority should discuss the cooperation between the authorities at meetings on a strategic level twice every year, and there should be an ongoing dialogue on specific cases, and collaboration meetings should be held every two months. FMK has also initiated and conducted joint meetings to find effective ways to prevent market abuse and unwanted trends in collaboration with FI and the trading venues. Preparation of aggravated insider offences has been criminalized in July 2011. A person who prepares to commit such an offence shall be sentenced to a term of imprisonment not exceeding two years.</p> <p>Implemented</p>
<p>Enhance NOMX DM's risk management procedures and separate financial resources between NOMX DM and NOMX COM</p>	<p>Nasdaq Clearing has developed its operations since the FSAP 2011. The legal requirements covering Nasdaq Clearing's operations have changed since 2011, becoming both more stringent and more granular. Nasdaq Clearing is authorized under EMIR since March 2014. Some of the changes in Nasdaq Clearing's operations introduced due to EMIR requirements were of the same character as the recommended actions in the FSAP 2011. The clearing business has been separated from the exchange business of Nasdaq in Stockholm. The clearing business is in a separate legal entity, which only carries out clearing services. Nasdaq Clearing has introduced member contributed default funds. Nasdaq Clearing has today three different default funds, one for each line of clearing business. The governance structure in Nasdaq Clearing has been enhanced by member representation. Nasdaq Clearing has a member risk committee and also other advisory committees populated by members. Nasdaq Clearing has changed its arrangement for collecting collateral from clearing members. The new collateral management system makes it possible for Nasdaq Clearing to have complete information on who has provided the collateral and the composition of the collateral. Bank guarantees not fully backed by collateral have been phased out as eligible collateral for the commodity business lines. Bank guarantees not fully backed by collateral benefitted from an exemption in EMIR and were therefore allowed as collateral until mid-March 2016. The sources of liquidity have been diversified. Nasdaq Clearing relies partly on credit lines as liquid resources. Nasdaq Clearing has multicurrency credit lines with four liquidity providers, three with major Scandinavian banks and one with a bank outside the Scandinavian region. Nasdaq Clearing has also access to intraday credit with the Riksbank. Nasdaq Clearing does still allow investments with lower credit rating than AAA, but there are limits in the investment policy regarding investments rated below AAA.</p> <p>Implemented</p>

Recommendation	Status
Review the relevant laws and regulations to address the legal uncertainty related to settlement finality and collateralization procedures	<p>This was addressed by an amendment to Chapter 3, section 2 of the Bankruptcy act (SFS 1987:672), from which it now follows that a bankruptcy estate cannot request the return in case of transfer or other disposition of financial instruments, currencies, gold or certain credit claims. The amendment removes inter alia the previous uncertainty regarding the validity of a transfer order which a Swedish participant enters into a designated settlement system on the day of, but after, notice of a bankruptcy decision. There is no explicit provision to regulate what applies in case of the bankruptcy of non-Swedish participants. The latter issue can however be managed by the systems, e.g. by stipulating a legal opinion in order for the non-Swedish entity to become a participant. The amendment to the Bankruptcy act entered into force on 1 March 2015, following a Government bill presented for the Parliament in June 2014.</p> <p>Implemented</p>
Review its act to allow RB to issue regulations and clarify the division of responsibilities between the RB and FI	<p>A project on increased security in the central payments system in Sweden has been initiated by the Ministry of Finance. It intends among other thing to clarify the powers of the Riksbank as regards the actors within central payments system. The Riksbank oversees the financial infrastructure with the aim of safeguarding the stability of the entire financial system. FI has responsibility for financial stability through its supervision of the individual FMIs in Sweden. FI also grants licenses to engage in such activities as clearing and settlement, as well as operations as central counterparty. The areas of responsibility of the two authorities occasionally overlap. In these cases, the authorities endeavor to develop efficient forms for contacts and cooperation. Formalized cooperation exists between the two authorities.</p> <p>Implemented</p>
Reconstitute the mandate of the Domestic Standing Group to focus on contingency planning and crisis management	<p>Contingency planning and crisis management have been strengthened by the establishment of the FSC and the new EU based framework to handle credit institutions in distress, the BRRD.</p> <p>Implemented, but further steps needed</p>
Hold crisis simulation exercise with all four parties to the domestic MoU	<p>In fall 2014, the Ministry of Finance together with staff from FI, the NDO, and the Riksbank arranged a series of seminars to run through a hypothetical resolution process under the BRRD regime. The seminars had more than 30 participants divided into three groups, including the responsible state secretary from the ministry as well as the heads of FI and the NDO, and the vice chairman of the Riksbank. The seminars were arranged as workshops based on hypothetical simulations of institutions in distress. The discussion covered whether or not to initiate resolution; single point of entry or multiple points of entry; assessment of bail-inable debt; restoring the viability of the institution through balance sheet measures. The seminars were ex post evaluated as informative and productive, leaving the participants with a number of issues to address as they returned to their</p>

Recommendation	Status
	<p>respective ordinary work and continued to prepare for a real world resolution process in future. The legislation implementing the BRRD entered into force in Sweden in February 2016. There is ongoing preparatory work within the FSC for an upcoming crisis simulation exercise.</p> <p><i>In progress</i></p>
<p>Carry out a reform of deposit insurance including shortening the payout period and redefining the payout trigger</p>	<p>In 2011, the government presented a bill that implemented the changes set out in the European Parliament's and Council's Directive 2009/14/EC of March 11, 2009 amending Directive 94/19/EC on deposit guarantee. The amendments entered into force on July 1, 2011. The bill focused on coverage and payment delay. It also brought certain improvements in the management of deposit guarantee, and introduced a new alternative process for initiating compensations. Moreover, the payment period for compensation was shortened to 20 days and a stricter disclosure obligation was introduced for both institutions as well as for relevant authorities.</p> <p><i>Implemented</i></p>
<p>Introduce a special bank insolvency regime with a possibility of deposit insurance fund to support bank restructuring</p>	<p>In February 2016, the EU's new bank recovery and resolution directive (BRRD) entered into force in Sweden through two new laws and a number of changes to existing national laws. The BRRD introduces a framework for the resolution of credit institutions and investment firms, as well as companies within the same corporate group as such institutions and firms. A central feature in the new resolution process is that institutions' owners and lenders, rather than the state, should bear losses. The state will step in only as a last resort, once owners and lenders have contributed extensively to recapitalizing the affected institution. In the Swedish implementation, the NDO is the designated resolution authority with responsibility for handling the resolution process of an individual institution. FI is given further supervisory tasks aimed at preventing institutions from ending up in a situation which motivates initiating a resolution process. The new legislation also creates a new fund—the resolution reserve—which will be financed by contributions from the sector. The resolution reserve is created to cover costs of future reconstruction and resolution measures. With the BRRD implemented, bank owners as well as bank lenders are primarily responsible to bear any losses in a crisis. This reduces the risk to public finances and to the tax payers. At the same time, financial stability is enhanced thanks to the new resolution reserve as it increases the shock absorbing capacity of the financial system. Two new laws have been created, the Resolution Act and the Act on Preventive Public Support to Credit Institutions. The bill also imposes changes to other laws, including the Banking and Financing Business Act and the Securities Market Act.</p> <p><i>Implemented</i></p>
<p>Formalize communication between RB and FI in assessing</p>	<p>According to an MoU between FI and Riksbank signed in 2009, the two authorities should have routines for smooth and efficient exchange of information and plans for crisis mitigation. For this purpose, among others, there is an advisory group. Pursuant to the MoU, this group has the ultimate</p>

Recommendation	Status
institutions' solvency and viability in the context of emergency liquidity assistance	<p>responsibility for consultation and exchange of information between the two authorities in a crisis situation. The group is also responsible for developing routines for coordination of crisis mitigation. The group should meet every three months and may be summoned ad hoc on short notice. The MoU is currently subject to a review. The new Resolution Act introduces obligations for consultation between the authorities related to actions before resolution could be considered.</p> <p>Implemented</p>
Develop a formal process, in the context of the proposed FSC, on international reserve management policy	<p>Discussions related to international reserve management policy (with potential fiscal implications) have not been on the agenda of the Council. The Riksbank has devised internal policies that ensure an efficient management of its international reserves.</p> <p>Limited implementation</p>
Establish measures in relation to the criminalization of terrorism financing to enable the freezing of all funds	<p>The lacunae in Sweden's implementation of its obligations under UNSCR 1373 arising from the inability of the EU system to offer implementation of the resolution to deal with the so called EU internal terrorists was one of the subjects of an official government inquiry (Sanktionslagsutredningen, SOU 2006:41). In its report, produced in 2006 and sent out for the requisite public consultation in 2008, the inquiry proposed certain national legislation for the implementation of the resolution to the extent that implementation did not take place at the EU level. The intended reform of the Swedish national measures to supplement the EU implementation system was put on hold in the spring of 2009 in view of the then imminent entry into force of the EU Lisbon Treaty, which, through the new Article 75, seemed to offer common EU ways of filling the gap. No legislative measures have to date been adopted at the EU level. A vast majority of EU Member States have adopted national measures that allow for listings of EU internal terrorists. Hence, a Committee of Inquiry was appointed (2015:91) (#112) and given an assignment to, inter alia, propose an effective system Sweden to implement targeted economic sanctions concerning terrorism and the financing of terrorism. The inquiry has also been tasked to submit legislative proposals necessary for this purpose. It is to present its report by November 3, 2016.</p> <p>In progress</p>
Amend the legal framework to require current beneficial ownership information	<p>With the implementation of the fourth anti-money laundering directive, a central register for information of beneficial ownership will be introduced in Sweden. An official inquiry presented a proposal in February 2016, and the Ministry of Finance is working on a legislative proposal. The new legislation is expected to be in force by June 2017.</p> <p>In progress</p>

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
BANKING SECTOR: SOLVENCY RISK				
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> • Four largest bank holding companies 		
	Market share	<ul style="list-style-type: none"> • 75 percent of total banking sector's assets 		
	Data and baseline date	<ul style="list-style-type: none"> • Banks' own data • Consolidated banking group • Baseline date: 2015 Q4 	<ul style="list-style-type: none"> • Publicly available data • Consolidated banking group • Baseline date: 2015 Q4 	<ul style="list-style-type: none"> • Supervisory data • Consolidated banking group • Baseline date: 2015 Q4
2 Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> • Banks' internal models constrained by EBA guidelines 	<ul style="list-style-type: none"> • A simple top-down approach by Riksbank and FI focused on modeling loan losses 	<ul style="list-style-type: none"> • Balance sheet-based approach
	Satellite Models for Macro-Financial linkages	<ul style="list-style-type: none"> • Macrofinancial linkages: Banks were required to calculate, under the EBA scenarios and the EBA methodology, potential losses, pre-provision net revenue, provision for loan losses and capital levels as a function of macro and financial variables from the scenarios. • Net interest income: Banks' own methodology to project net interest income based on the repricing of their portfolio; net interest income could not increase under the baseline or the stress scenario; the margins were constrained: (i) the margin paid on liabilities could not increase less than the highest amount between a proportion 	<ul style="list-style-type: none"> • Macrofinancial linkages: The focus was on projecting provisions for loan losses as a function of macro and financial variables from the scenario • Provisions for loan losses: projected using a model that fits historical credit losses, bank by bank, to macro variables, and conditional on the stress scenario it gave a projection of the aggregate credit loss level for each of the four banks The second model estimated the relative risk for different exposures which was used to distribute the losses estimated in the first model across different asset classes and countries 	<ul style="list-style-type: none"> • Macrofinancial linkages: Income statement items and balance sheet items (loans and funding in particular) modeled and forecasted as functions of macro variables from scenarios as explanatory variables Growth rate of balance sheets in the stress scenario was set to zero (but adjusted to exchange rate changes and mark to market losses) • Net interest income: maturity gap analysis due to a general increase in interest rates that affected all banks' banking and trading books was used; all interest earning assets and liabilities in each bracket were assumed grow at projected loan growth rate Margins calculated using the EBA methodology

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<p>of the increase in the sovereign spread and that of an idiosyncratic component; (ii) the increase of the margin on repriced assets was capped by a proportion of the increase in sovereign spreads</p> <ul style="list-style-type: none"> Operational risk losses: Losses from new conduct risk events and other operational risk losses were subject to a floor Non-interest income, expenses: Banks' own estimates, but subject to constraints for specific P&L items; Administrative expenses and other operating expenses could not fall below the 2015 value Provisions for loan losses: calculated as expected losses using point in time projected PD, LGDs and exposures A static balance sheet assumption; the exposure for the computation of the leverage ratio remained constant 	<ul style="list-style-type: none"> Pre-provision net revenue: projected by applying a 20 percent haircut 	<ul style="list-style-type: none"> Non-interest income excluding trading: projected as a function of GDP growth, interest rates using a panel regression model Trading income: losses in the value of trading and AFS fixed income securities due to interest rate and credit spread risks assessed through a duration approach. In the case of all securities HTM (including those issued by sovereigns), no losses were computed from changes in general interest rates. Losses on equity positions were modeled as a function of Stock exchange index, interest rates and real GDP dynamics Non-interest expense: projected as a function of total assets in a panel regression model Provisions for loan losses: projected as total credit losses using a panel regression model AOCI: projected unrealized losses on AFS securities using the duration approach
	Stress test horizon	<ul style="list-style-type: none"> 2015Q4–2018Q4 	<ul style="list-style-type: none"> 2015Q4–2020Q4 	

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
3. Tail shocks	Scenario analysis	<ul style="list-style-type: none"> • Baseline: EBA baseline scenario • Stress: EBA stress scenario reflecting Sweden-specific risks as well as spillovers from a recession in the Nordic and Baltic region. The Sweden-specific stress scenario was driven by a confluence of shocks to produce a deep recession. Recovery was slowed by domestic balance sheet adjustments, so the overall GDP profile is somewhat 'L-shaped' • In the stress scenario unemployment rate rose by a 6 percentage point rise over a four period. The cumulative growth rate of real GDP was equal to 7 percent over the first three years (GDP growth rates were negative for three years), equity prices fell by 25 percent in the first year, house prices declined by 35 percent over the first three years • The Sweden-specific macro scenarios were supplemented with a set of scenarios for the Nordic and Baltic region. 	<ul style="list-style-type: none"> • Baseline: IMF's <i>World Economic Outlook</i> baseline scenario as of April 2016 and EBA baseline • Stress: EBA stress scenario with more severe interest rate (100 bps in the first year) and exchange rate (10 percent depreciation) shocks 	
	Sensitivity analysis/one-	N.A.	• N.A.	• Interest rate risk in the banking book: steepening of the yield curve depending on currency (e.g., 100 bps

	time add-on shock			<p>widening in the short end of the curve; 350 bps widening in the long end of the curve for Sweden)</p> <ul style="list-style-type: none"> • Market risk shocks on Trading, AFS securities and CVA: Equity index shocks: stock market decline (OMX by 40 percent, S&P 500 by 30 percent, Stoxx 50 by 50 percent, MSCI Asia (e.g., Japan) by 40 percent, Nikkei 225 by 30 percent); Currency valuation shocks: 40 percent depreciation of the SEK against the U.S. dollar, 20 percent depreciation against the euro, 30 percent depreciation against GBP; (iii) commodity price decline (energy, base metals, precious metals and grains by 40, 40, 25, and 30 percent, respectively); (iv) interest rates (depending on the currency and maturity) and credit spreads (depending on exposure) increase. • Counterparty default shock (top 10 exposures) • Shutdown of foreign exchange swaps market: impact on net open position and capital, CCR risk-weighted assets and credit risk-weighted assets • Low interest rates for a long time • Constant loan supply versus dynamic forecast of credit (modeled using panel regression model and macro
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Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
				and financial variables as independent variables) <ul style="list-style-type: none"> • Less severe interest rate shock in the baseline • Corporate sector stress test
4. Risks and Buffers	<ul style="list-style-type: none"> • Risks/factors assessed • (How each element is derived, assumptions) 	<ul style="list-style-type: none"> • Credit risk (granular sectoral exposures) including securitizations: Banks' internal models based on stressed point-in-time PD and LGD parameters and grade migration; Prescribed loss parameters for sovereign exposures • Market risk, CCR and CVA: Full revaluation of the trading and Afs/FVO portfolio; Default of the two most vulnerable of the 10 largest stressed CCR exposures • Operational risk, including conduct risk: banks' own projections for the advanced measurement approach (AMA), basic approach and standard approach • Taxes: a common simplified tax rate of 30 percent 	<ul style="list-style-type: none"> • Credit risk (granular sectoral and geographical exposures) • Tax rate: After-tax net income (or loss) was calculated by applying a consistent tax rate to pre-tax net income (or loss) 	<ul style="list-style-type: none"> • Credit risk (households, corporates, sovereign, financial institutions exposures): estimated according to Basel III framework, under IRB approach • Market risk: mark-to-market valuation of securities in trading book and AFS/FVO using the duration approach • Taxes: set at the pooled average tax rate over the last 20 years
	Behavioral adjustments	<ul style="list-style-type: none"> • Dividend, fees and commission remained constant in the baseline; minimum of the ratio 	<ul style="list-style-type: none"> • The constant balance sheet assumption 	<ul style="list-style-type: none"> • Constant and dynamic balance (for the baseline) sheet assumptions were analyzed; for the dynamic case the

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<p>to total assets of 2015 and the average of the two years with the smallest value that occurred 2011–15 in the stress scenario; For dividends paid: Pay-out ratio was based on publicly declared dividend policies If no policy was available, the pay-out ratio in the baseline was the maximum of 30 percent and the median of the pay-out ratios in profitable years 2011–15; in the stress scenario, the same amount of dividends was assumed (0 except for loss-making banks)</p> <ul style="list-style-type: none"> The static balance sheet assumption 	<ul style="list-style-type: none"> If after tax net profit was positive, a dividend ratio of 75 percent was assumed 	<p>balance sheet growth and funding growth were modeled and forecasted using a panel regression with fixed effects and macro variables as exogenous variables</p> <ul style="list-style-type: none"> Dividend payout schedule followed capital conservation rule; banks could distribute maximum dividend amount equal to dividend payout ratio (dividends over net income) in the base-year (2015) if they were not capital constrained; dividends were paid out only if bank records profits Asset disposals and acquisitions over time not considered; the portfolio composition remained unchanged over time, with maturing exposures replaced with similar ones
5. Regulatory and Market-Based Standards and Parameters	Calibration of risk parameters	<ul style="list-style-type: none"> Banks used their models rather than resort to benchmarks to determine stressed PD and LGD parameters Banks employed a rating transition matrix-based approach, considering the effects of PD/LGD grade migration on the level of default and impairments 	<ul style="list-style-type: none"> For corporate exposures (and retail SME) PD was modelled using EDFs for all country exposures, except for the Baltic countries PDs for household exposures were based on the level of indebtedness and the level of unemployment The model estimates for PD were also subject to expert judgment LGDs 	<ul style="list-style-type: none"> Projected losses distributed across different asset classes and countries Projected point in time PDs for each asset class (and country) calculated as projected loan losses for each asset class/(LGD x projected exposures by asset class) Downturn LGDs provided by banks-stayed constant at 2015Q4 level Point in time PDs and downturn LGDs used for both credit losses and

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		projected in the stress test horizon for the given scenarios	were mostly based on expert judgment	stressed risk-weighted asset calculations
	Regulatory/ Accounting and Market-Based Standards	<ul style="list-style-type: none"> Capital standards: Basel III capital Capital metrics: Tier 1 common capital ratio, common equity tier 1 ratio, Tier 1 capital ratio, total capital ratio and the leverage ratio; all ratios reported on a transitional and a fully loaded basis Hurdle rates: NA; hurdle rates used from the IMF top down approach 	<ul style="list-style-type: none"> Capital standards: Basel III capital Capital metrics: Tier 1 common capital ratio, common equity tier 1 ratio, Tier 1 capital ratio, total capital ratio and the leverage ratio; all ratios reported on a transitional and a fully loaded basis Hurdle rates: NA; hurdle rates used from the IMF top down approach 	<ul style="list-style-type: none"> Capital standards: Basel III CET1 capital, leverage ratio Capital metrics: Common equity tier 1 ratio, Basel III leverage ratio Hurdle rate: regulatory hurdle rate (Basel III regulatory minimum, other Pillar 2 own-fund requirements associated with pension risk, concentration risk and interest rate risk in the banking book, microprudential mortgage floors) and local supervisory requirements that took into account the buffers (systemic risk surcharge, the countercyclical capital buffer, and macroprudential mortgage floors) 100 percent of AOCI phase out from CET1 capital from 2016 onwards 100 percent phase in factor on deductions from CET1
		<ul style="list-style-type: none"> Risk-weighted assets- credit risk: CRR requirements based on stressed PD and LGD parameters; a prescribed increase in REA for securitization exposures, as well as prescribed shocks to credit risk losses for sovereign 	<ul style="list-style-type: none"> Risk-weighted assets: risk weights went up by 75 percent per year for the first three years and 0 afterwards Market risk-weighted assets and Operational risk-weighted assets were not considered 	<ul style="list-style-type: none"> Risk-weighted assets- credit risk: using Basel II, IRB formula that translated downturn LGDs, changes in through the cycle PD (that are adjusted for projections of point-in-time PDs), changes in assets correlation, the maturity adjustment parameter and exposures (also

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<p>exposures; risk-weighted assets floored by 2015 value</p> <ul style="list-style-type: none"> • Risk-weighted assets- market risk: based on a common set of stressed market parameters, calibrated from the macroeconomic scenario, as well from historical experience, and on haircuts for sovereign exposures; constant for STA approaches; VaR constant in the baseline and replaced by SVaR in the stress scenario; Stressed IRC and CVA capital requirements; Prescribed haircuts for AFS/FVO sovereign positions; risk-weighted assets for IRC and CVA floored by the increase for IRB REA; Prescribed simplified approach based on historical NTI volatility for HFT 		<p>adjusted for depreciation of SEK) into stressed risk-weighted assets</p> <ul style="list-style-type: none"> • Risk-weighted assets for market and operational risk taken from the banks, reported for the BU test
6. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> • Distribution of CET1 ratios by bank in the baseline and stress scenario • Contribution to the change in system wide CET1 ratio in the baseline and stress scenario • Contribution of each component of the income statement to change in profits in the baseline and stress scenario • Structure of losses (by sectors and countries) • Evolution of PDs • Number of banks and share of total assets below hurdle rates • Capital shortfall under each scenario relative to GDP • Results of sensitivity analysis 		

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
BANKING SECTOR: LIQUIDITY RISK				
1. Institutional Perimeter	Institutions included	• N.A.	• N.A.	• Four largest banks
	Market share	• N.A.	• N.A.	• 75 percent
	Data and baseline date	• N.A.	• N.A.	• Supervisory data (COREP, FINREP) • Consolidated banking group as of 2015Q4
2. Channels of Risk Propagation	Methodology	• N.A.	• N.A.	• Swedish LCR ('old' Basel III version) by currency • Proxy NSFR by currency • Cash flow analysis using maturity ladder by currency
3. Tail shocks	Size of the shock	• N.A.	• N.A.	• Shocks reflected in adjustment factors (haircuts and run-off rates) applied to high-quality liquid assets/counterbalancing capacity and outflows; Factors were informed by the Basel III liquidity metrics (baseline scenario) and more severe episodes of market and funding risks (stress scenario)
4. Risks and Buffers	Risks	• N.A.	• N.A.	• Funding liquidity risk, rollover risk • Market liquidity shock
	Buffers	• N.A.	• N.A.	• Liquid assets/Counterbalancing capacity
5. Regulatory and Market-Based	Calibration of risk parameters	• N.A.	• N.A.	• Baseline scenario: haircuts and run-off rates calibrated based on the LCR/NSFR

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
Standards and Parameters				<ul style="list-style-type: none"> Stress scenario: stressed LCR (parameters were broadly consistent with the Lehman type liquidity squeeze, as documented by Schmieder and others (2011)) and NSFR (The parameters of the stress scenario were adjusted by 10 percentage points comparing to the baseline)
	Regulatory standards	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> For LCR and NSFR threshold set to 100 For maturity ladder based on survival horizon
6. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> Distribution of LCRs and NSFRs by currency, by bank Survival period of each bank in the baseline and stress scenario Drivers of banks' liquidity position and high quality liquid assets/counterbalancing capacity, for each scenario 		
BANKING SECTOR: SPILLOVER RISKS				
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> 4 largest banks 	
	Market share	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> 75 percent of banks' assets 	
	Data and baseline date	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> 2015Q4 	
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Espinosa and Sole (2013) network analysis based on a matrix of bilateral exposures 	
3. Tail shocks	Size of the shock	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Credit (default of each bank) and funding shocks; Parameters for LGD, and the share of funding previously granted by the defaulted banks that non-defaulted banks are unable to replace and the fire-sale discount were set to 25 percent. In the sensitivity analysis, the parameters were doubled 	

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
4. Risks	Risks	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Contagion risk 	
INSURANCE SECTOR: SOLVENCY RISKS				
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> • 4 life insurers • 3 non-life insurers 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • 4 life insurers • 3 non-life insurers
	Market share	<ul style="list-style-type: none"> • Life: 78 percent (gross written premiums) • Non-life: 53 percent (gross written premiums) 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Life: 78 percent (gross written premiums) • Non-life: 53 percent (gross written premiums)
	Consolidation level	<ul style="list-style-type: none"> • Groups' worldwide consolidated business (if applicable) 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Groups' worldwide consolidated business (if applicable)
	Data	<ul style="list-style-type: none"> • Companies' own data 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Companies' own data, mainly based on regular supervisory reporting
	Baseline date	<ul style="list-style-type: none"> • 01/01/2016 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • 01/01/2016
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> • Companies' internal calculations 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Balance sheet-based approach • Companies' asset and liability cash flow projections (60 years) • Companies' data on fixed-income portfolio and guaranteed interest rates
	Stress test horizon	<ul style="list-style-type: none"> • Asset shocks assumed to occur instantaneously. • Participants provided projections for a three-year horizon (2016-2018) assuming unchanged interest rates, risk 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Asset shocks assumed to occur instantaneously • Long-term projection for asset-liability mismatches

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<p>premia and asset prices after the shock has occurred</p>		
3. Tail shocks	Scenarios	<ul style="list-style-type: none"> European Insurance and Occupational Pensions Authority 'double-hit' scenario: low risk-free interest rates and increase in risk premia. IMF stress scenario: broadly in line with macrofinancial scenario used in the banking ST. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> IMF stress scenario: broadly in line with macrofinancial scenario used in the banking stress tests Low-for-long interest rate scenario
	Sensitivity analysis	<ul style="list-style-type: none"> 500 bps increase in Swedish covered bond spreads. Longevity shock: Permanent 20 percent decrease in mortality rates (life insurers only). Mortality shock: Permanent 15 percent increase in mortality rates (life insurers only). Pandemic event: Temporary 35 percent increase in disability/morbidity rates for the next 12 months. Catastrophic event (non-life insurers only): <ul style="list-style-type: none"> Windstorm: Repetition of windstorm Gudrun, hitting 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> None

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<p>the Nordic countries in 2005.</p> <ul style="list-style-type: none"> • U.S. hurricane: Repetition of hurricane Andrew in 1992. 		
4. Risks and Buffers	Risks/factors assessed	<ul style="list-style-type: none"> • European Insurance and Occupational Pensions Authority 'double-hit' scenario. <ul style="list-style-type: none"> • Interest rate shock: one-year SEK risk-free rate: -60 bps; 10-year: -63 bps. • Equity shock: -28.4 percent for Swedish stocks. • Property shock: <ul style="list-style-type: none"> -4.6 percent for Swedish residential real estate; -4.2 percent for Swedish commercial property • Sovereign credit spread: +141 bps for 10-year Swedish government bonds. • Corporate credit spread: Increase in credit spreads between 16 bps (for AAA financials) and 516 bps (for unrated financials). • IMF stress scenario <ul style="list-style-type: none"> • Interest rate shock: one-year SEK risk-free rate: -33 bps; 10-year: +32 bps. • Equity shock: -25.4 percent (domestic and global). 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • IMF stress scenario. • Focus on the long-run impact of the low interest environment, especially on guaranteed business

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<ul style="list-style-type: none"> • Property shock: -32.5 percent (domestic), -20 percent (global). • Sovereign credit spread: Increase in credit spreads of Swedish government bonds by 136 bps. • Corporate credit spread: Increase in credit spreads between 50 bps (for AAA) and 300 bps (for BB and lower). • Default of largest banking counterparty (100 percent write-off for equity and subordinated bonds, 50 percent write-off for unsecured bonds, 15 percent write-off for secured bonds). • Currency shock: 13.9 percent depreciation of SEK. • Mass lapse event: Discontinuance of 20 percent of insurance policies for which discontinuance would result in an increase of 		

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		technical provisions without the risk margin are discontinued.		
	Risk aggregation	<ul style="list-style-type: none"> All shocks of the scenarios were assumed to occur together and simultaneously, therefore summation of shock effects within each scenario, no diversification effect. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> All shocks of the scenarios were assumed to occur together and simultaneously, therefore summation of shock effects within each scenario, no diversification effect.
	Buffers	<ul style="list-style-type: none"> Absorption effect of technical provisions (profit sharing) Absorption effect of deferred taxes Absorption effect of 'long-term guarantee measures' as part of the Solvency II framework 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> None
	Behavioral adjustments	<ul style="list-style-type: none"> Management actions limited to non-discretionary rules in place at the reference date 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> None
5. Regulatory and Valuation Parameters	Regulatory regime	<ul style="list-style-type: none"> Solvency II. Solvency I for occupational pension business pursued under Art. 308 of the Solvency II Directive 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Solvency II. Solvency I for occupational pension business pursued under Art. 308 of the Solvency II Directive.
	Valuation	<ul style="list-style-type: none"> National GAAP (market-consistent). 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> National GAAP (market-consistent)
6. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> Impact on solvency ratios. Impact on net income. Dispersion measures of solvency ratios and net income. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Impact on valuation of assets and liabilities, Impact on available own funds and solvency ratios, Capital shortfall under each scenario in nominal terms and relative to GDP

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
		<ul style="list-style-type: none"> Capital shortfall under each scenario in nominal terms and relative to GDP 		
ASSET MANAGERS: LIQUIDITY RISKS				
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Largest investment funds (95 percent of the industry) divided into different styles
	Data and baseline date	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> 2015Q4
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> Comparing redemptions with capacity of market for a particular asset class to be sold in an orderly manner. Assuming a ranking of assets to be sold to meet redemptions. Pro rata approach. Redemptions applied to individual investment funds of the same style; redemptions calculated by style of investment fund as an average redemption rate across all investment funds of the same style; shock: first percentile of redemption rates' distribution
	Stress test horizon	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> One quarter (shock characterized by a run on a fund represented by an assumed redemption rate)
3. Tail shocks	Sensitivity analysis	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A. 	<ul style="list-style-type: none"> N.A.

Domain		Assumptions		
		Bottom-Up by Financial Institutions	Top-Down by Authorities	Top-down by FSAP Team
4. Risks and Buffers	Risks	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Liquidity risk (a run on investment fund).
	Buffers	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • N.A. 	<ul style="list-style-type: none"> • Liquid assets, assets sold. • Capacity of a particular market to absorb sell-off of corresponding asset to meet redemptions (by comparing investment fund's portfolio of a particular security with market turnover of the same security)