



# FINLAND

## FINANCIAL SYSTEM STABILITY ASSESSMENT

December 2016

This paper on Finland 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 November 8, 2016

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November 8, 2016

Approved By

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Mahmood Pradhan**

Prepared By

**Monetary and Capital  
Markets Department**

This report is based on the work of the Financial Sector Assessment Program (FSAP) missions that visited Finland and Frankfurt during March 28–April 14 and June 14–30, 2016. The FSAP findings were discussed with the authorities during the Article IV consultation mission in September 2016.

- The FSAP team was led by Marco Piñón and included Peter Breuer (deputy mission chief), Atilla Arda, Nathaniel Arnold, Chikako Baba, Kay Chung, Pierpaolo Grippa, Eija Holttinen, Cyril Pouvelle, Nadine Schwarz, Sabine Tuzik, and Javier Ochoa (all IMF staff), as well as Jonathan Fiechter, Mindaugas Leika, and Rodney Lester (external experts). The mission met Permanent Secretary and other staff of the Ministry of Finance (MoF), the Governor of the Bank of Finland (BoF) and his staff, the Director General of the Finnish Financial Supervisory Authority (FIN-FSA) and her staff, management and staff of the European Central Bank (ECB), representatives of banks, insurance companies, and other financial institutions, industry associations, policy research organizations, and auditors.
- FSAPs assess the stability of the financial system as a whole and not that of individual institutions. They are intended to help countries identify key sources of systemic risk in the financial sector and implement policies to enhance its resilience to shocks and contagion. Certain categories of risk affecting financial institutions, such as operational or legal risk, or risk related to fraud, are not covered in FSAPs.
- Finland is deemed by the Fund to have a systemically important financial sector and the stability assessment under this FSAP is part of bilateral surveillance under Article IV of the Fund's Articles of Agreement.
- This report was prepared by Messrs. Marco Piñón and Peter Breuer with inputs from the Finland FSAP team members.

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## Glossary

ABS	Asset-Backed Securities
AML/CFT	Anti-Money Laundering and Combating the Financing of Terrorism
Basel I	International Convergence of Capital Measurement and Capital Standards (July 1988)
Basel II	International Convergence of Capital Measurement and Capital Standards: A Revised Framework – Comprehensive Version (June 2006)
Basel III	A global regulatory framework for more resilient banks and banking systems (revised version June 2011)
BCP	Basel Core Principles
BoF	Bank of Finland
CAR	Capital Adequacy Ratio
CCPs	Central Counterparties
CET1	Common Equity Tier 1
CPCM	Contingency Planning and Crisis Management
CRD	Capital Requirements Directive
CRR	Capital Requirements Regulation
CSEs	Covered Swap Entities
DGS	Deposit Guarantee Scheme
EAD	Exposure at Default
EBA	European Banking Authority
EC	European Commission
ECB	European Central Bank
EEA	European Economic Area
EIOPA	European Insurance and Occupational Pensions Authority
ELA	Emergency Liquidity Assistance
ESRB	European Systemic Risk Board
EU	European Union
FATF	Financial Action Task Force
FFSA	Finnish Financial Stability Authority
FIA	Financial Institutions Act
FIN-FSA	Finnish Financial Supervisory Authority
FSAP	Financial Sector Assessment Program
FMI	Financial Market Infrastructure
FSI	Financial Soundness Indicator
FSSA	Financial System Stability Assessment
G-SIB	Globally Systemically Important Bank
HP	Hodrick-Prescott filter
IOSCO	International Organization of Securities Commissions

IRB	Internal Ratings Based approach
LCR	Liquidity Coverage Ratio
LGD	Loss Given Default
LSIs	Less Significant Institutions
LTV	Loan to Value
MoF	Ministry of Finance
MoU	Memorandum of Understanding
NBAB	Nordea Bank AB
NBF	Nordea Bank Finland
NBSG	Nordic-Baltic Stability Group
NCA	National Competent Authority
NFC	Non-financial Corporation
NPL	Nonperforming loan
NSFR	Net Stable Funding Ratio
OECD	Organization for Economic Cooperation and Development
OTC	Over the Counter
PD	Probability of default
ROE	Return on Equity
RWA	Risk-Weighted asset
SCR	Solvency II Capital Requirements
SIFI	Systemically Important Financial Institution
SRB	Systemic-Risk Buffer
SSM	Single Supervisory Mechanism
TRIM	Targeted Review of Internal Models
WEO	World Economic Outlook

## EXECUTIVE SUMMARY

**Notwithstanding the three-year recession, Finland's banking system remains well capitalized and profitable.** While low interest rates have squeezed net interest income, banks have increased income from trading and insurance, and reduced cost-income ratios, helping to maintain profitability. Nonperforming loans have remained low and capitalization ratios are well above requirements, though buffers may be exaggerated by the aggressive use of risk weights. The Net Stable Funding Ratio suggests that vulnerabilities from maturity mismatches are limited in aggregate.

**Nevertheless, previously identified vulnerabilities remain and some have increased.** The banking system remains largely reliant on external wholesale funding. Social safety nets have helped protect disposable income in recent years, and thus the financial sector through households' debt servicing capacity. Fiscal buffers, however, have been eroded, and households' rising debt levels make them more vulnerable to income and interest shocks. Key macrofinancial risks include a lackluster recovery from the domestic recession, adverse macroeconomic or financial shocks in a Nordic country, and a sharp growth slowdown in advanced economies, in particular the euro area.

**Stress tests suggest that banks are largely resilient to solvency shocks but exposed to liquidity shocks.** While risk-weighted capital ratios would remain above regulatory minima under a severe macroeconomic stress scenario, unweighted leverage ratios would fall below the hurdle rate. A severe disruption in external wholesale funding or in the covered bond market could lead to systemic liquidity shortfalls.

**The authorities are encouraged to ensure that adequate bank capital and liquidity cushions are maintained.** The Finnish authorities should pursue their plan to set risk weight floors for mortgages and the ECB should proceed with its comprehensive review of banks' internal risk models, and reinforce their ongoing monitoring. In case of emerging imbalances, the authorities should ensure adequate liquidity cushions are maintained.

**Supervisory financial and human resources need to be augmented and the regulatory authorities adequately empowered to be up to the challenges of the new regulatory environment.** Bank and non-bank supervision, macroprudential policy making and contingency planning have become more intense, intrusive, and resource-intensive. This has stretched the supervisory resources of the Finnish Financial Supervisory Authority (FIN-FSA) and the Finnish Financial Stability Authority (FFSA), which will also need to keep pace with the demands of the broader global regulatory reforms. In addition, the FIN-FSA needs to be granted the powers to credibly enforce supervisory action. Moreover, the legal and operational framework for legal protection of officials, staff, and agents of the agencies should be strengthened.

**In light of Nordea Finland's likely conversion to a branch, the authorities should conclude the multilateral supervisory MoU under negotiation with the Sweden's Financial Supervision Agency and other supervisors in the region.** This should provide a basis within existing EU

regulations to strengthen the role of host supervisors of systemically important bank branches. Nordea will remain systemically important in Finland even after its Finnish banking subsidiary is converted into a branch, with nearly one third of domestic deposits. The ease with which liquidity can be transferred across borders within banking groups poses a particular concern for Finland. While the Finnish authorities (and ECB) will remain members of the supervisory college, direct supervision of the Finnish banking operations of Nordea will be transferred to Sweden. When a branch is of systemic importance in a host country (i.e., the disorderly failure of the bank would be expected to have systemic repercussions on the host country's financial system and financial stability), consideration should be given in future revisions of CRD IV to provide for enhanced supervisory powers for the host country supervisors, in close coordination with the home country supervisor. The objective of such revisions would be to facilitate the host country's understanding of the risks posed by the branch and to enable it to take actions to promote the resilience and resolvability of the branch.

**The prolonged period of low interest rates has heightened risks in the non-bank financial sector.** Although the life insurance sector has moved towards unit-linked products, policies with implied guaranteed rates substantially above current interest rates still comprise up to 40 percent of insurer's technical provisions. Moreover, solvency is depressed by the low risk free rates used as discount factors to calculate technical provisions and own funds. Likewise, economic and demographic pressures have prompted pension insurers (the main providers of occupational pension schemes in Finland) and pension funds to increase the riskiness of their investment portfolios.

**Several macroprudential instruments have been formally approved and activated recently, but the toolkit should be expanded and data gaps filled.** While the tools currently activated appear appropriate, the FIN-FSA's mandate should be broadened beyond tools explicitly approved in the legislation. In particular, the systemic risk buffer should be made available for activation if needed. Also, macroprudential tools based on the terms of loans (such as maximum maturity limit) and borrowers' eligibility (such as a cap on the loan-to-income ratio) should be considered. To effectively use these measures and enable risk analyses using granular data, a loan registry system should be created.

**Finland's contingency planning and crisis management (CPCM) framework rests on strong foundations, but actions are needed to ensure operational capacity to rapidly deploy recovery and resolution tools.** The separation between CPCM functions (supervision, resolution, and liquidity provision) reduces potential conflicts. This should be complemented by clearly assigning the overall responsibility to actively oversee crisis preparedness and management at the national and Banking Union levels. CPCM cooperation among Nordic countries should be strengthened, compensating for the authorities' diminished role in resolution planning and decision-making that would follow Nordea Bank Finland's conversion to a branch. Resolution planning for systemic banks should be expedited.

## KEY RECOMMENDATIONS

<b>Table 1. Finland FSAP: Key Recommendations</b>	
<b>Recommendations and Responsible Authorities</b>	<b>Time*</b>
<b>General</b>	
1. Increase the FIN FSA and FFSA's financial and human resources in accordance with the increase in regulatory complexity and supervision intensity in (i) prudential supervision of banks (including systemic branches), (ii) prudential supervision of insurers, (iii) contingency planning/crisis management, (iv) macroprudential policy analysis, and (v) investment funds and their managers. (Box 1, ¶30, ¶36, ¶43, ¶44, ¶48, ¶51)	I, C
2. Expand cooperation arrangements with other Nordic supervisors to include (i) formal region-wide sharing of supervisory data and coordinated inspections, including foreign branches and cross-border management of investment funds, (ii) conduct Nordic stress tests, (iii) strengthen collaboration with macroprudential authorities, and (iv) enhanced CPCM cooperation on systemically important branches and regular crisis simulation exercises. (¶13, ¶47, ¶44, ¶52)	NT
3. Strengthen legal protection for staff of all financial oversight agencies (¶50)	I, C
<b>Risk Analysis</b>	
4. Ensure banks' Internal Ratings Based models are calibrated to reflect severe stress. (¶19)	NT
5. Intensify monitoring of banks' liquidity positions in foreign currencies and crossholdings of covered bonds used as collateral. Perform liquidity stress tests for various time horizons and stand ready to take supervisory action if imbalances emerge. (¶23, ¶41)	NT
<b>Banking Supervision</b>	
6. Amend law to grant the FSA full Pillar 2 powers for decisions on capital and liquidity requirements and other supervisory measures (¶38)	NT
7. Ensure effective ongoing monitoring of banks' internal risk models following the upcoming SSM comprehensive review (TRIM project). (¶40)	MT
<b>Macroprudential Policy Framework</b>	
8. Clearly define a macroprudential policy mandate of the FIN-FSA beyond the measures approved in laws. (¶48)	NT
9. Create a household loan registry. (¶48)	NT
10. Introduce a systemic risk buffer and a loan-to-income limit. (¶48)	I, NT
11. Finalize the plan to introduce floors for the risk-weights used in internal models. (¶48)	I
<b>Contingency Planning and Crisis Management</b>	
12. Formalize inter-agency cooperation on crisis preparedness and management at the national level, possibly through an expanded mandate for the FFSA Advisory Council (¶51)	I
13. Under the oversight of the FFSA Advisory Council, ensure agency-specific and national financial crisis planning. (¶51-52)	I, C
14. Expedite resolution planning for systemic financial institutions. (¶52)	I
15. Define strategies for liquidity assistance to banks in resolution and introduce an indemnification arrangement for ELA losses if incurred by the BoF. (¶51)	NT
<b>Non-banks</b>	
16. Upgrade legislation to cover the supervisory actions and any other measures required in the event of pension insurer or fund distress and if resolution becomes necessary. (¶42)	I
17. Ensure adequacy of action plans for life insurers to meet Solvency II requirements, including by conducting regular stress testing under adverse scenarios. (¶30)	NT
18. Monitor fund managers' risk management processes, increase the use of supervisory data to analyze risks, and improve FIN-FSA's capability to conduct market surveillance. (¶32)	NT, C

\* C = continuous; I (immediate) = within one year; NT (near term) = 1-3 years; MT (medium term) = 3-5 years.

# MACROFINANCIAL SETTING

## A. Macroeconomic Setting

**1. The economy has emerged from a three-year recession, but the outlook is for a slow and fragile recovery.** The decline of the paper industry and the technology company Nokia, exacerbated by weak external demand contributed to a 3 percent drop in GDP over 2012–14 (Figure 1 and Table 2). The fiscal deficit breached the Stability and Growth Pact's 3 percent of GDP threshold in 2014, and public debt exceeded 60 percent of GDP in 2015. Growth turned positive in 2015, and is expected to solidify over the medium term but remain well below its pre-crisis average. Headline inflation recently turned positive along with rising oil prices, but remains low. The high unemployment rate is projected to slowly fall over the next few years.

**2. Financial cycle and structural indicators offer a mixed picture.** The credit-to-GDP gap has steadily declined since 2009 and was slightly positive as of end-2015 (Figure 2). Credit to the private non-financial sector is at a historic peak (183 percent of GDP), though this is near the OECD median. Household debt (including tenant-owned housing company loans) is at 125 percent of disposable income, which is a historic high, though below other Nordic countries. In contrast, house prices have declined slightly since 2013 and standard measures of house price valuation (e.g. price-to-income ratio) do not indicate significant overvaluation.

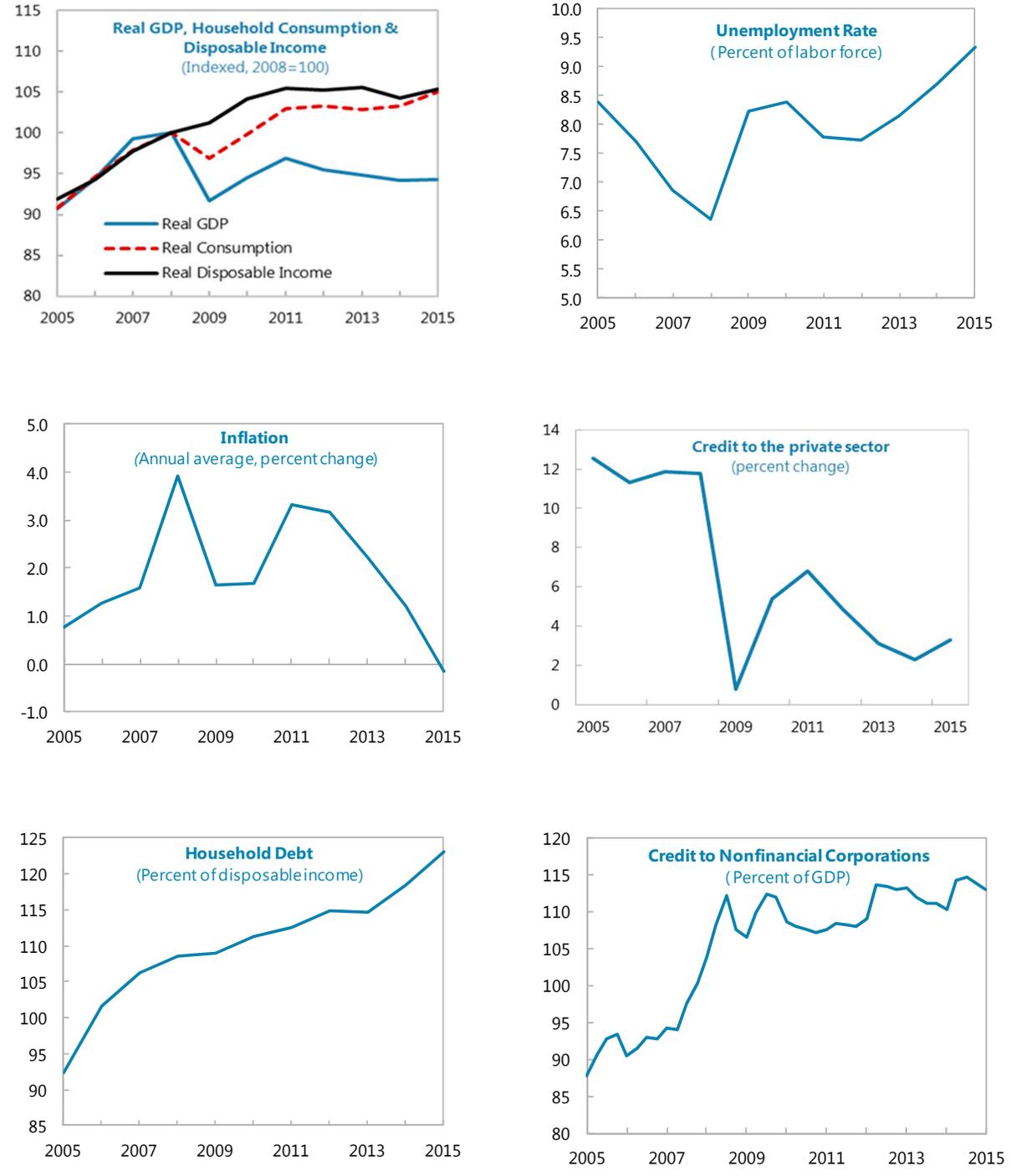
**3. Finland's financial position with the rest of the world is close to balance but there is considerable variation across sectors** (Figure 3 and Table 3). Banks and non-financial corporations (NFC) are net debtors to the rest of the world, though in the case of NFCs nearly 60 percent of the external liabilities are equity. The government is a net creditor to the rest of the world, largely due to pension schemes being included as part of the government in the national accounts. Households are also net external creditors, largely through institutional investors (e.g. pension funds, insurers, and investment funds).

## B. Structure of the Financial System

**4. Finland's financial system is relatively large with credit institutions constituting the largest share** (Figure 4 and Table 4). The financial systems' assets were equivalent to about 400 percent of GDP in 2015, with banks' assets of 230 percent of GDP, of which foreign-owned banks assets of 160 percent of GDP. Pension funds, insurance companies, and other financial intermediaries manage assets worth 51, 35 and 72 percent of GDP, respectively.

**5. There are significant links between some banks and non-bank financial firms.** Many non-banks are part of financial conglomerates. For example, OP Financial Group controls both the largest domestically-owned bank and the largest non-life insurance company. In other cases, insurance companies have exposures to banks through their equity holdings. For example, Sampo Group controls two of the largest insurance companies in Finland and owns over 20 percent of Nordea, the Swedish bank whose Finnish subsidiary is the largest bank in Finland.

**Figure 1. Macroeconomic Developments**



Sources. Statistics Finland, IMF WEO, IMF International Financial Statistics, and Fund staff calculations.

Table 2. Selected Economic Indicators, 2012-2021

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
									Proj.	
	(Percentage change, unless otherwise indicated)									
<b>Output and demand (volumes)</b>										
GDP	-1.4	-0.8	-0.7	0.2	0.9	1.1	1.3	1.5	1.6	1.6
Domestic demand	-1.2	-1.1	-0.2	1.4	1.1	1.1	1.3	1.4	1.5	1.5
Private consumption	0.3	-0.5	0.6	1.5	1.4	0.9	1.0	1.3	1.4	1.4
Public consumption	0.5	1.1	-0.5	0.4	-0.3	-0.4	-0.1	0.1	0.3	0.3
Gross fixed capital formation	-1.9	-4.9	-2.5	0.7	3.6	3.5	3.4	3.2	2.9	2.9
Change in stocks (contribution to growth in percent of GDP)	-1.0	0.0	0.2	0.3	-0.3	0.0	0.0	0.0	0.0	0.0
Exports of goods and services	1.2	1.1	-1.7	-0.2	1.0	1.8	2.2	2.8	3.0	3.1
Imports of goods and services	1.6	0.5	-0.2	1.9	1.7	1.8	2.2	2.7	2.8	2.8
Net exports (contribution to growth in percent of GDP)	-0.2	0.3	-0.6	-0.8	-0.2	0.0	0.0	0.0	0.1	0.1
<b>Prices, costs, and income</b>										
Consumer price inflation (harmonized, average)	3.2	2.2	1.2	-0.2	0.4	1.2	1.6	1.9	2.0	2.0
Consumer price inflation (harmonized, end-year)	3.4	1.9	0.6	-0.2	0.9	1.4	1.6	1.9	2.0	2.0
GDP deflator	3.0	2.6	1.7	1.6	1.4	1.4	1.6	1.9	2.0	2.0
Unit labor cost, manufacturing	10.7	-5.0	-1.9	-1.3	-0.1	-1.5	-1.0	-0.5	0.0	0.5
<b>Labor market</b>										
Labor force	0.3	-0.6	0.2	0.3	-0.1	0.0	-0.2	-0.3	-0.3	-0.2
Employment	0.4	-1.1	-0.4	-0.4	0.3	0.3	0.2	0.2	0.2	0.2
Unemployment rate (in percent)	7.7	8.2	8.7	9.3	9.0	8.7	8.3	7.8	7.3	7.0
<b>Potential output and NAIRU</b>										
Output gap (in percent of potential output) <sup>1</sup>	-1.9	-2.7	-3.3	-2.9	-2.4	-1.9	-1.6	-1.2	-0.7	0.0
Growth in potential output	0.3	0.1	-0.1	-0.2	0.3	0.7	0.9	1.1	1.1	1.2
	(Percent of GDP)									
<b>General government finances<sup>2</sup></b>										
Overall balance	-2.2	-2.6	-3.2	-2.8	-2.4	-2.6	-2.0	-1.5	-1.2	-0.9
Primary balance <sup>3</sup>	-0.8	-1.4	-1.9	-1.6	-1.3	-1.5	-1.0	-0.5	-0.1	0.5
Structural balance (in percent of potential GDP)	-1.2	-1.0	-1.0	-0.5	-0.5	-0.9	-0.7	-0.5	-0.5	-0.6
Structural primary balance (in percent of potential GDP) <sup>3</sup>	0.2	0.2	0.2	0.6	0.6	0.1	0.3	0.5	0.6	0.8
Gross debt	53.9	56.5	60.2	63.6	65.0	66.2	66.6	66.7	66.2	65.2
Net debt <sup>4</sup>	-50.2	-53.7	-54.4	-50.6	-47.1	-43.4	-40.1	-37.3	-34.8	-32.7
	(Percent)									
<b>Money and interest rates</b>										
M3 (Finnish contribution to euro area, growth rate, e.o.p.)	0.5	4.1	1.3	5.0	...	...	...	...	...	...
Finnish MFI euro area loans (growth rate, e.o.p.)	7.1	7.7	3.8	0.9	...	...	...	...	...	...
Domestic nonfinancial private sector credit growth (e.o.p.)	3.8	4.4	1.2	4.1	4.5	4.7	5.0	5.4	5.7	5.8
3-month Euribor rate (percent)	0.6	0.2	0.2	...	...	...	...	...	...	...
10-year government bonds yield	1.9	1.9	1.4	0.7	...	...	...	...	...	...
	(Percent of GDP)									
<b>National saving and investment</b>										
Gross national saving	20.5	19.8	19.8	20.4	21.0	21.4	21.8	22.2	22.5	22.9
Gross domestic investment	22.5	21.4	20.9	21.1	21.4	22.0	22.5	22.8	23.1	23.4
<b>Balance of payments</b>										
Current account balance	-1.9	-1.6	-1.1	-0.4	-0.5	-0.5	-0.6	-0.6	-0.6	-0.5
Goods and services balance	-1.1	-0.5	-0.5	0.1	0.3	0.3	0.2	0.2	0.2	0.3
Net international investment position	11.7	3.9	-2.6	0.6	0.2	-0.3	-0.8	-1.3	-1.7	-2.1
Gross external debt	227.5	207.7	218.5	210.9	210.5	209.7	207.9	204.4	200.7	197.5
<b>Exchange rates (period average)</b>										
Euro per US\$	0.78	0.75	0.75	0.90	...	...	...	...	...	...
Nominal effective rate (appreciation in percent)	-3.3	2.6	1.9	-2.4	...	...	...	...	...	...
Real effective rate (appreciation in percent) <sup>5</sup>	-2.9	2.2	1.3	-4.0	...	...	...	...	...	...

Sources: Bank of Finland, BIS, International Financial Statistics, IMF Institute, Ministry of Finance, Statistics Finland, and Fund staff calculations.

<sup>1</sup> A negative value indicates a level of actual GDP that is below potential output.

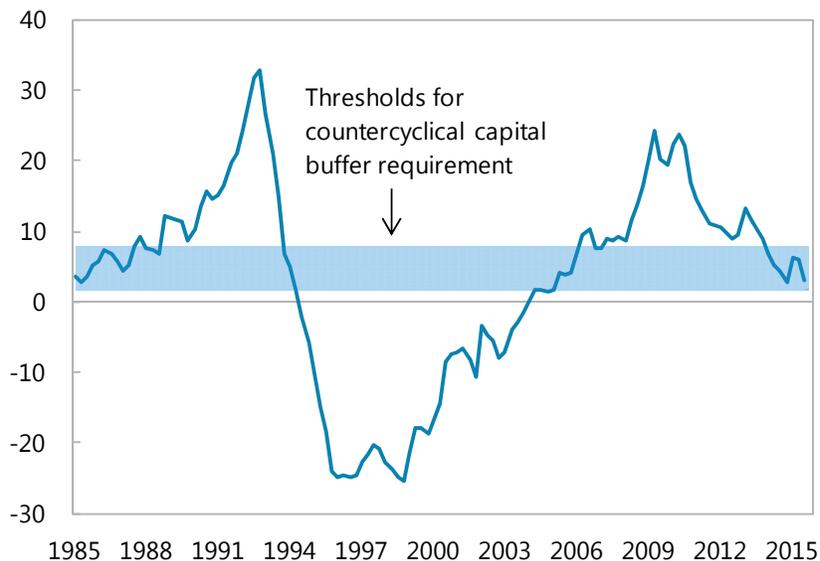
<sup>2</sup> Fiscal projections include measures as specified in the General Government Fiscal Plan.

<sup>3</sup> Adjusted for interest expenditure.

<sup>4</sup> Defined as the negative of net financial worth (i.e., debt minus assets).

<sup>5</sup> CPI-based real effective exchange rate.

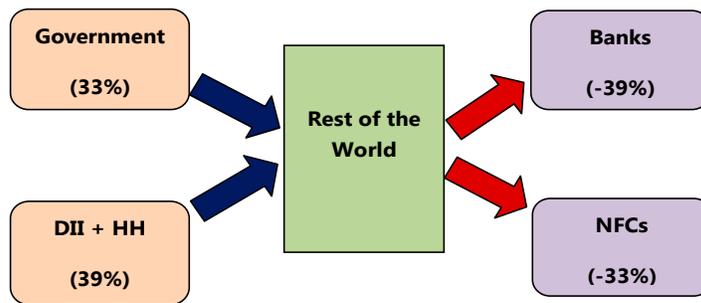
**Figure 2. Credit Gap: Trend Deviation of Credit to Private Nonfinancial Sector**  
(Percent of GDP)



Sources. BIS, Statistics Finland, Bank of Finland, and Fund staff calculations.

Note. The indicator has been calculated according to Basel Committee (2010) recommendations using the one-sided Hodrick Prescott filter (lambda = 400,000).

**Figure 3. Finland: Sectoral External Net Asset Positions, 2015**  
(Percent of GDP)



Sources. Statistics Finland and Fund staff calculations.

Notes. Arrows indicate net asset positions (assets minus liabilities) of different Finnish sectors vis-à-vis the Rest of the World (direction indicates the direction of the net claim). Numbers in parentheses are the sectoral net asset positions vis-à-vis the Rest of the World (in percent of 2015 GDP). "Government" combines the central bank and the general government (which includes statutory pension schemes) positions in Table 2. "DI + HH" combines domestic institutional investors' (e.g., insurance, investment funds, etc.) and households' net positions.

**Table 3. Inter-sectoral Financial Assets and Liabilities Positions, 2015**  
(Percent of GDP)

		Public Sector		Financial Private Sector		Non-Financial Private Sector		Non-resident	Total
		Government	Central Bank	Banks	Dom. Inst. Investors	NFCs	Households	Rest of the World	
Government	Assets	2.8	1.2	8.9	9.4	40.2	1.1	68.6	132.1
	Liabilities	2.8	4.0	9.7	1.2	4.4	2.6	52.2	76.8
	Net	0.0	-2.7	-0.8	8.2	35.8	-1.5	16.4	55.3
Central Bank	Assets	4.0	0.0	2.1	0.0	0.1	0.0	22.1	28.3
	Liabilities	1.2	0.0	13.4	0.1	0.5	3.5	5.6	24.4
	Net	2.7	0.0	-11.3	-0.1	-0.4	-3.5	16.4	3.9
Banks & other MFIs	Assets	9.7	13.4	17.6	7.3	32.9	66.3	120.0	267.2
	Liabilities	8.9	2.1	17.6	9.0	22.1	45.7	158.9	264.3
	Net	0.8	11.3	0.0	-1.6	10.7	20.6	-38.9	2.9
Domestic Institutional Investors	Assets	1.2	0.1	9.0	23.6	15.0	1.7	60.6	111.1
	Liabilities	9.4	0.0	7.3	23.6	6.2	42.3	27.7	116.4
	Net	-8.2	0.1	1.6	0.0	8.8	-40.6	32.9	-5.3
Non-Financial Corporations	Assets	4.4	0.5	22.1	6.2	68.1	3.2	64.1	168.6
	Liabilities	40.2	0.1	32.9	15.0	68.1	42.2	97.6	295.9
	Net	-35.8	0.4	-10.7	-8.8	0.0	-39.0	-33.4	-127.3
Households & NPISHs	Assets	2.6	3.5	45.7	42.3	39.2	0.1	6.1	139.3
	Liabilities	1.1	0.0	66.3	1.7	3.2	0.1	0.0	72.3
	Net	1.5	3.5	-20.6	40.6	36.0	0.0	6.1	67.0
Rest of the World	Assets	52.2	5.6	158.9	27.7	97.6	0.0	0.0	342.0
	Liabilities	68.6	22.1	120.0	60.6	64.1	6.1	0.0	341.5
	Net	-16.4	-16.4	38.9	-32.9	33.4	-6.1	0.0	0.5

Sources: Statistics Finland and Fund staff calculations.

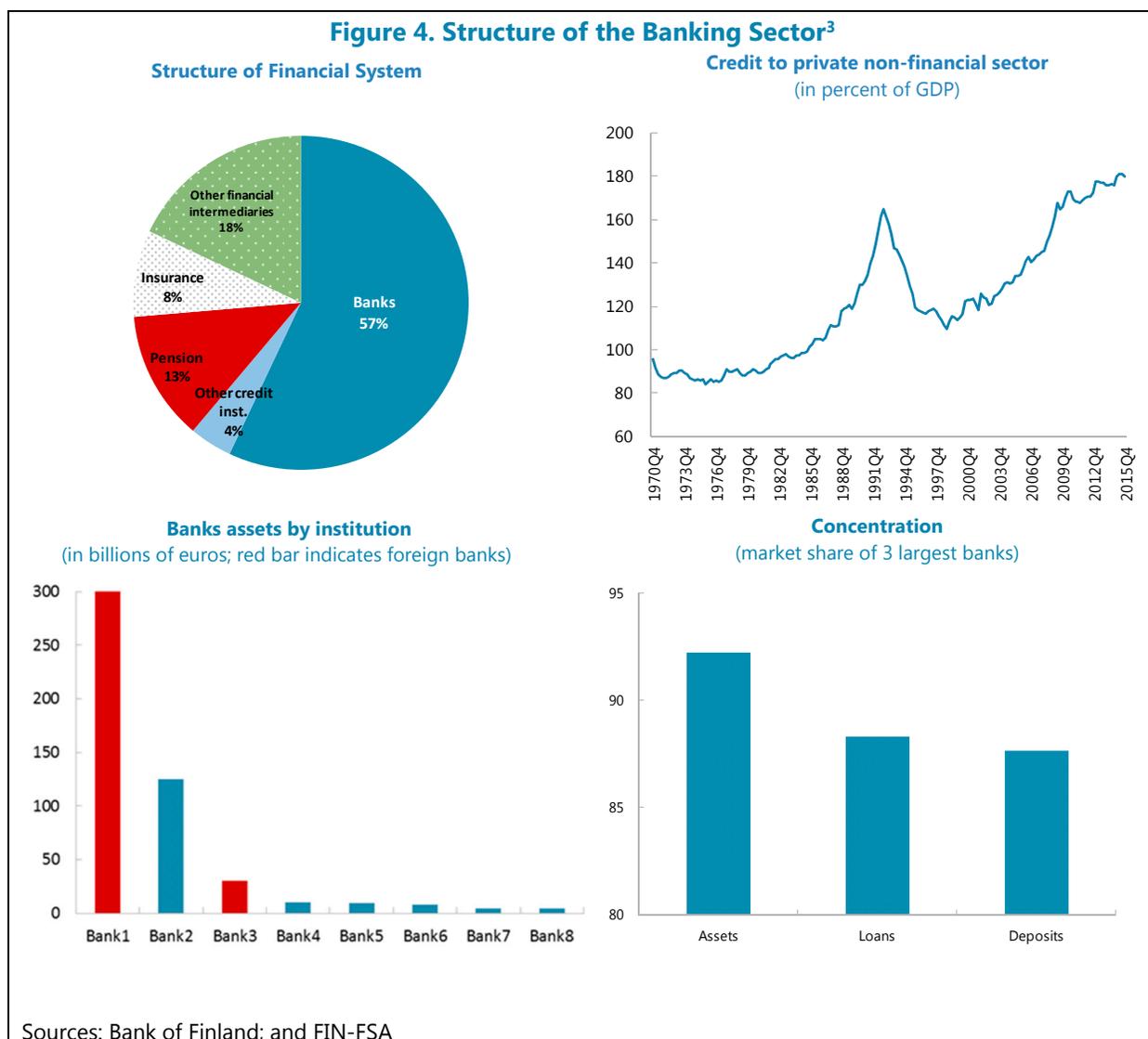
Notes: Financial assets, liabilities, and net financial assets positions (in percent of GDP) of sector  $i$  (rows) with respect to sector  $j$  (column) for 2015 from the annual Financial Accounts. "Domestic Institutional Investors" includes money market funds, collective investment schemes, other financial intermediaries, insurance corporations, and pension funds.

**6. The banking system is highly concentrated and foreign banks play a major role.** The three largest banks account for 93 percent of assets and 88 percent of loans. Two foreign-owned banks—Nordea Bank Finland (NBF) and Danske Bank Finland—account for 70 percent of banks' assets (Figure 4). NBF accounts for nearly two thirds of the banking system's assets (including derivatives), and nearly one third of domestic deposits and lending. The large domestic cooperative bank accounts for over a third of domestic lending and deposits. Though there are no state-owned banks, Municipal Finance is jointly owned by municipalities, funded in debt markets, and only lends to municipalities and municipality-owned firms.

**7. Wholesale funding, particularly from external sources, is a major funding source for banks.** The loan-to-deposit ratio stands at about 124 percent.<sup>1</sup> Wholesale funding accounts for over half of banks' funding, including deposits from credit institutions, covered bonds, and senior unsecured bonds (Figure 5).<sup>2</sup> Most of this wholesale funding is provided by foreign financial institutions, including parent banks, about three quarters is short-term.

<sup>1</sup> This excludes non-deposit taking credit institutions which fund themselves in international capital markets.

<sup>2</sup> Given the peculiarity of Nordea group's derivatives being booked in NBF's balance sheet, Finnish banking sector funding is calculated by excluding derivatives and shareholder's equity from the balance sheet.



**8. Banks' lending is concentrated on domestic households and firms, though lending abroad is also important.** About two thirds of loans go to domestic sectors, of which slightly above half goes to households, most of which is mortgage loans. The most important sectoral lending exposures of banks are to the real estate and manufacturing sectors. About one third of lending is to non-residents, including financial firms.

**9. While households are largely reliant on credit from domestic banks, non-financial corporations' financing is more diversified.** Bank lending comprises about 90 percent of household debt (Table 3). Non-financial corporations (NFCs) are less reliant on banks, but domestic MFIs still provide about 25 percent of their borrowing. Inter-company loans account for 24 percent of NFCs' borrowing, and a third is from abroad, primarily loans. Equity financing is also a critical source and constitutes a larger share of NFCs' total liabilities (52 percent) than debt (38 percent).

<sup>3</sup> Data includes derivatives.

**Table 4. Structure of the Financial System**

	2011	2012	2013	2014	2015	2015
	<i>Total assets in billions of Euros</i>					<i>Share of GDP in percent</i>
<b>Total financial system</b>	785.7	766.4	749.7	833.8	835.3	404
<b>Banks</b>	542.4	496.2	455.3	508.6	475.8	230
Commercial banks	446.7	394.5	352.4	397.3	352.9	171
Cooperative banks	88.0	93.2	93.8	101.7	111.6	54
Savings banks and joint-stock savings bank companies	7.8	8.4	9.1	7.9	8.5	4
Other banks	0.0	0.0	0.0	1.6	2.9	1
<b>MFIs</b>	567.3	522.7	481.8	539.0	510.2	246
Banks	542.4	496.2	455.3	508.6	475.8	230
Other non-deposit taking credit institutions	24.9	26.5	26.5	30.4	34.3	17
Municipality Finance Plc.	23.8	25.6	26.2	30.0	33.9	16
Others	1.0	0.9	0.4	0.4	0.4	0
<b>Other nonbank financial institutions</b>						
Pension institutions	88.4	92.1	96.5	100.8	105.1	51
Pension insurance companies	79.1	82.6	86.8	90.7	94.8	46
MEK (Seamen's funds)	0.7	0.7	0.7	0.8	0.8	0
Statutory pension funds	4.7	4.8	5.0	5.3	5.5	3
Additional pension funds	3.9	4.0	4.0	4.0	4.0	2
Insurance companies	51.1	56.3	61.5	65.9	70.3	34
Life insurance	38.5	43.1	46.8	50.6	54.5	26
Non-life insurance	12.6	13.2	14.7	15.4	15.8	8
Other financial intermediaries	78.8	95.3	109.9	128.1	149.7	72
Non money market fund Investment funds	55.7	66.7	75.3	89.1	103.8	50
Other financial intermediaries	23.1	28.6	34.6	39.0	46.0	22
<i>Memorandum items</i>						
Banks	542.4	496.2	455.3	508.6	475.8	230
Private	542.4	496.2	455.3	508.6	475.8	230
Domestic-owned	115.7	122.4	123.8	132.7	144.0	70
Foreign-owned	426.7	373.8	331.4	375.9	331.8	160
State-owned	-	-	-	-	-	-

Sources: The Finnish authorities and Fund staff calculations.  
Note. Pension funds include only legally funded pension. VER, Keva, the Lutheran Church Fund and the Farmers Fund are not included.

**10. The banking sector has significant and complex cross-border exposures.** They include assets and liabilities of around 120 percent and 150 percent of GDP, respectively, most of them within the Nordic region (Figure 7).<sup>4</sup> Cross-border credit (loans, and debt securities) account for 33 percent (45 percent) and cross-border derivatives for 25 percent (23 percent) of banks' assets (liabilities). Finnish banks are heavily dependent on intra-group funding within Nordic banking groups (deposits and debt securities). Most foreign exposures are in euros, followed by U.S. dollars and other Nordic currencies.

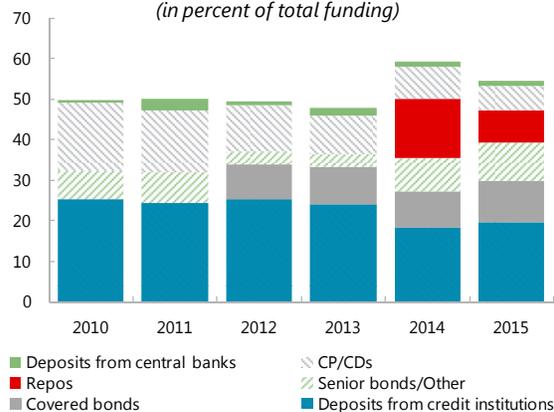
<sup>4</sup> Nordea's derivative business does not affect net exposures significantly, but increases gross foreign exposure drastically as it uses a foreign clearing house.

**Figure 5. Banking Sector: Funding structure**

*Banks are relatively reliant on wholesale funding...*

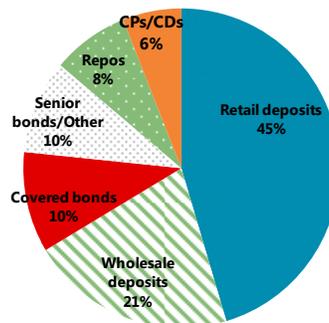
*...much of which is deposits from other credit institutions.*

**Finland: Banking sector wholesale funding composition**  
(in percent of total funding)

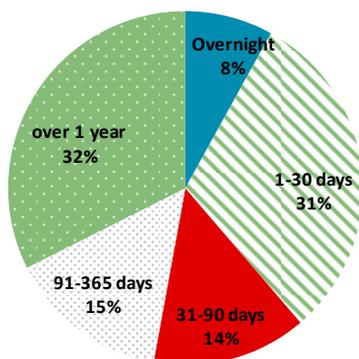


Note. Repos are separated from credit institutions deposits from 2014.

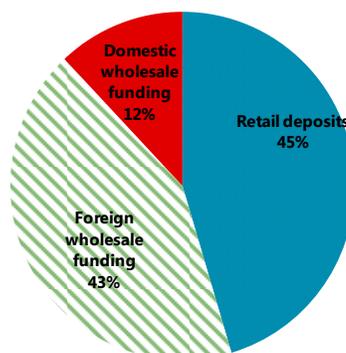
**Funding structure 2015**  
(in percent of total funding)



**Wholesale funding maturity profile**  
(in percent of wholesale funding)



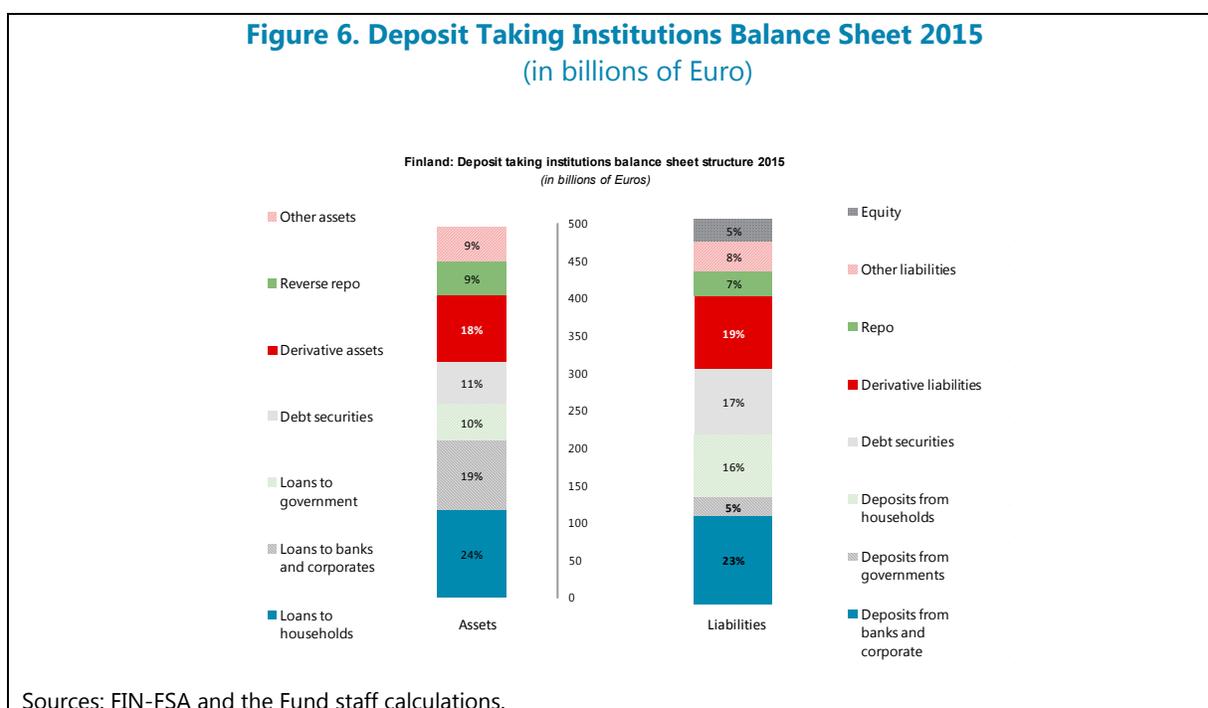
**Funding structure 2015**  
(in percent of total funding)



Source. FIN-FSA and Fund staff calculations.

**11. The concentrated and relatively large non-bank financial sector plays an important role in managing savings and diversifying portfolios.** Non-banks account for nearly 40 percent of the financial system. Five Finnish financial conglomerates control most of the domestic insurance and fund management companies. Non-banks also deliver a large component of the social insurance system such as in the form of the mandatory occupational pension system which is partially funded by the private sector. Investment funds allocate most of their assets abroad, reducing households' financial exposure to the domestic economy. About 40 percent of insurers' portfolios are invested in foreign assets. Pension funds' portfolios are also heavily weighted towards foreign assets, mainly equities.

**Figure 6. Deposit Taking Institutions Balance Sheet 2015**  
(in billions of Euro)



## RISKS AND VULNERABILITIES

### A. Key Macrofinancial Risks

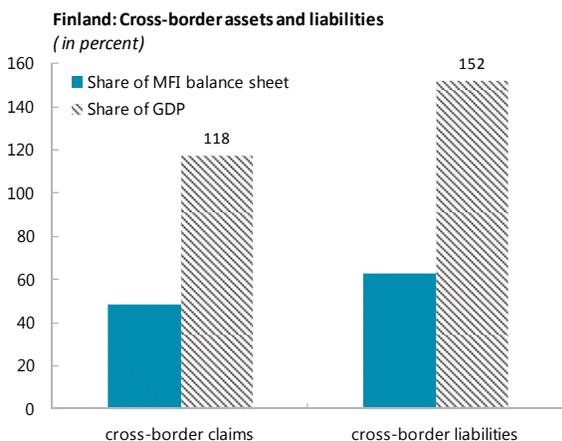
**12. While firms and households have so far maintained their ability to service their debts, they have become more vulnerable to shocks.** With interest rates near their historical low, and generous social safety nets, households have maintained consumption levels, indirectly protecting NFCs and banks. Moreover, the low interest rate has allowed households to devote a higher share of their variable term mortgages payments to principal. However, with higher levels of debt, households have become particularly vulnerable to interest and income shocks. The expected slow recovery will help improve financial sector indicators, but not address sufficiently key vulnerabilities. With slow growth, debt levels and fiscal vulnerabilities will remain elevated.

**13. There are a number of key risks to the outlook.** These include (i) a sharp rise in risk premia including distress in the euro area bond market; (ii) a sharp growth slowdown in advanced economies, in particular the euro area; (iii) heightened geopolitical risks in parts of the Middle East, Africa, and Europe, including a resurgence in tensions between the EU and Russia; (iv) adverse macroeconomic or financial shocks in a Nordic country; and (v) a sharp increase in energy prices.<sup>5</sup> The relative likelihood and expected impact of these risks is discussed in the attached Risk Assessment Matrix (Appendix I). Direct risks from Brexit primarily result from the exposure to derivatives cleared at a central counterparty in the United Kingdom.

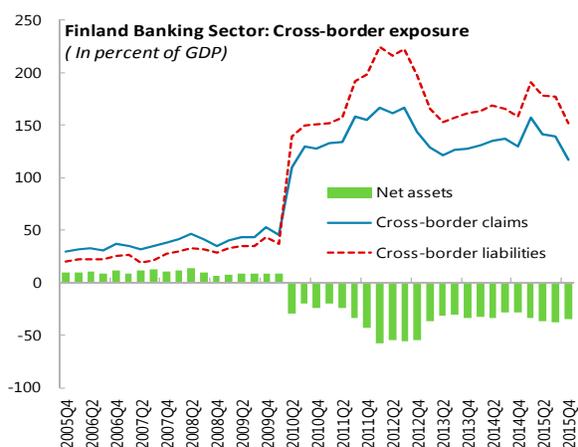
<sup>5</sup> According to the International Energy Agency and Statistics Finland, Finland has an oil and natural gas import dependency of 100 percent; energy imports from Russia account for 60 per cent of the value of all energy imports into the country. The imports from Russia include oil, coal, gas, nuclear fuel and electricity.

**Figure 7. Banking Sector: Cross-Border Exposure**

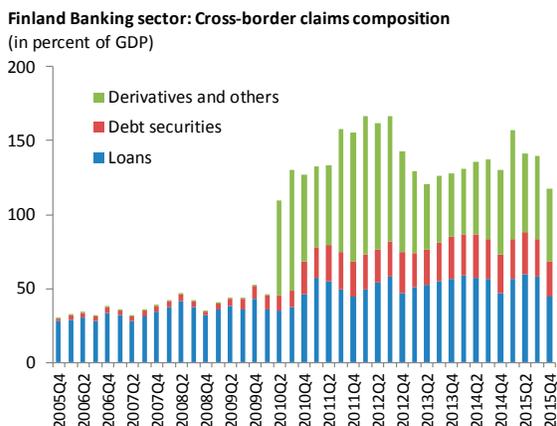
*Banks' cross-border exposure is significant...*



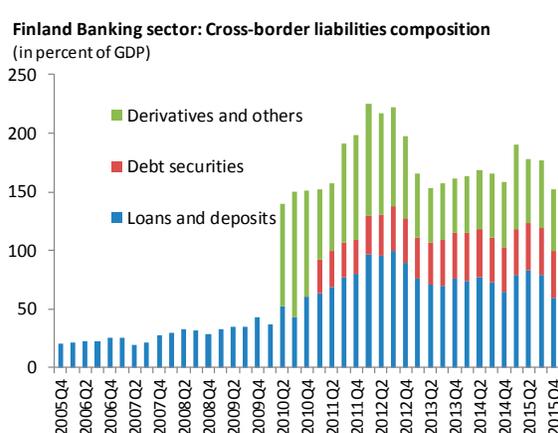
*...since Nordea centralized its derivatives in Finland.*



*Loans and deposits are a major source of exposures*

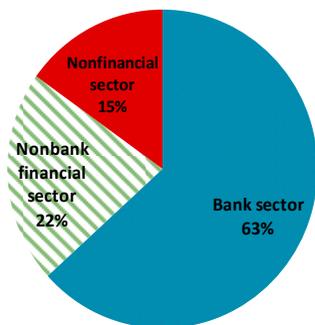


*Though derivatives account for a significant share too*



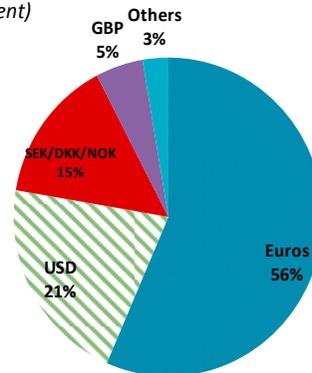
*The majority of exposures are to financial institutions*

**Cross-border claims counterparties 2015 (In percent)**



*Large share is in Euros, U.S. dollars and Nordic currencies*

**Cross-border liabilities currency breakdown 2015 (In percent)**

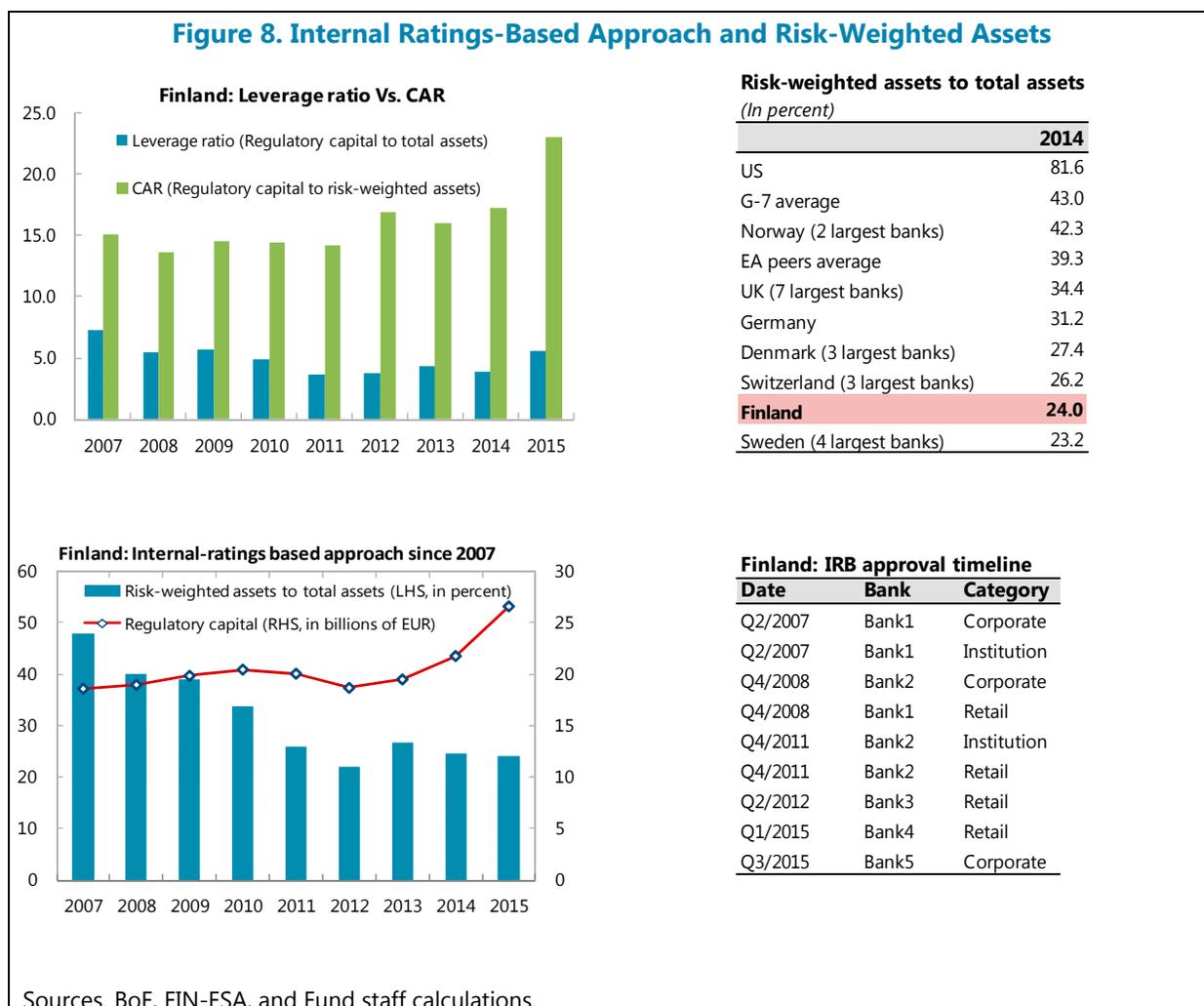


Sources: BIS, the Finnish authorities, and Fund staff.

## B. Banks

**14. Despite generally sound indicators, there are important vulnerabilities in the banking system.** These include funding risks, contagion risks, and long-term profitability challenges.

- **Funding.** A NSFR of 114 percent for the three largest banks suggests limited vulnerabilities from maturity mismatches in aggregate, though some banks have a ratio below 100 percent. With mostly foreign investors in their covered bonds, bank funding could be vulnerable to changes in foreign liquidity or a reversal in investor sentiment toward Finland; and a decline in the cover pool's credit ratings (mainly mortgages) would reduce Finnish banks' ability to obtain funding from the central bank.
- **Contagion.** The substantial integration amongst Nordic countries implies considerable exposure through valuations of banks' foreign assets and derivatives, as well as potential withdrawals of foreign funding, including from parent institutions. The latter would be heightened for banks operating under a foreign branch model. A sharp economic slowdown or drop of house prices in Sweden could have large effects in Finland.
- **Capitalization.** While the capital adequacy ratio (CAR) is high at 23.1 percent in 2015 (Figure 8 and Table 5), the leverage ratio (capital to total assets) of 5.6 percent is lower compared to peer countries (still above the 3 percent requirement). This reflects a relatively high share of assets with no risk-weights (e.g. public sector exposures) or low risk-weights stemming from the use of internal ratings-based (IRB) models. This suggests that banks' ability to absorb losses may be less than implied by the CAR. The Finnish authorities are planning to adopt risk weight floors for mortgages.
- **Profitability.** Banks' aggregate return on equity (ROE) is relatively high (Figure 9). There are, however, sustainability questions given that lower interest income has been offset by higher trading and insurance income, as well as reduced cost-income ratios.
- **Nonperforming loans.** Nonperforming loans (NPL) have remained at just 1.6 percent of total loans at end-2015, as safety nets shielded disposable income from the output contraction. Following the end of temporary amortization holidays, interest-only mortgages now account for less than 4 percent of the total. Nevertheless, a prolonged economic deterioration, particularly in the context of reduced fiscal space for safety nets, could cause NPLs to rise significantly.
- **Derivatives.** While mostly used to hedge against interest rate and exchange rate risks, they are considerable, posing counterparty risks to the Finnish banks. Derivatives cleared through Central Counterparties limit individual counterparty risk, but are still subject to the tail-risk of default by the CCP.

**Figure 8. Internal Ratings-Based Approach and Risk-Weighted Assets**

## Stability Analysis <sup>6</sup>

### Bank Solvency Stress Tests

**15. The banking system's capital resilience was assessed through "top-down" stress tests.** The focus was on supervisory data of the 4 significant institutions, with the collaboration of the ECB and FIN-FSA. The interaction between liquidity and bank solvency tests was integrated through the projection of banks' funding costs.

**16. The tests are based on a baseline and two adverse scenarios** (Figure 10) over a three-year horizon (2016-18). The scenarios based on the Risk Assessment Matrix (Appendix I, Figures 10 and 11) are in line with those applied in other recent FSAPs in euro area countries. The adverse scenarios are:

<sup>6</sup> See Technical Note on Stress Testing the Banking System and Interconnectedness Analysis for the details.

- **Moderate stress in the euro area.** This is driven by risk aversion affecting the European “periphery”, adverse investment sentiment, and a slowdown in emerging market economies. GDP growth and inflation would turn negative, unemployment would rise slowly, and bond and equity prices would decline.
- **Severe stress specific to Finland.** Assumes a shock similar in size to that of the early-1990s Nordic banking crisis (Figure 11). A severe disruption in Finland’s European partners (including large declines in house and other asset prices in the Nordic neighbors) would be amplified by a domestic demand confidence shock and a significant decline in residential real estate prices. A higher public deficit and debt would trigger a 3-notch downgrade of the sovereign rating and lead to reduced social benefits. As a result, GDP would decline 2.7 percent per year on average, and unemployment would rise sharply.

**Table 5. Finland: Financial Soundness Indicators**  
(in percent)

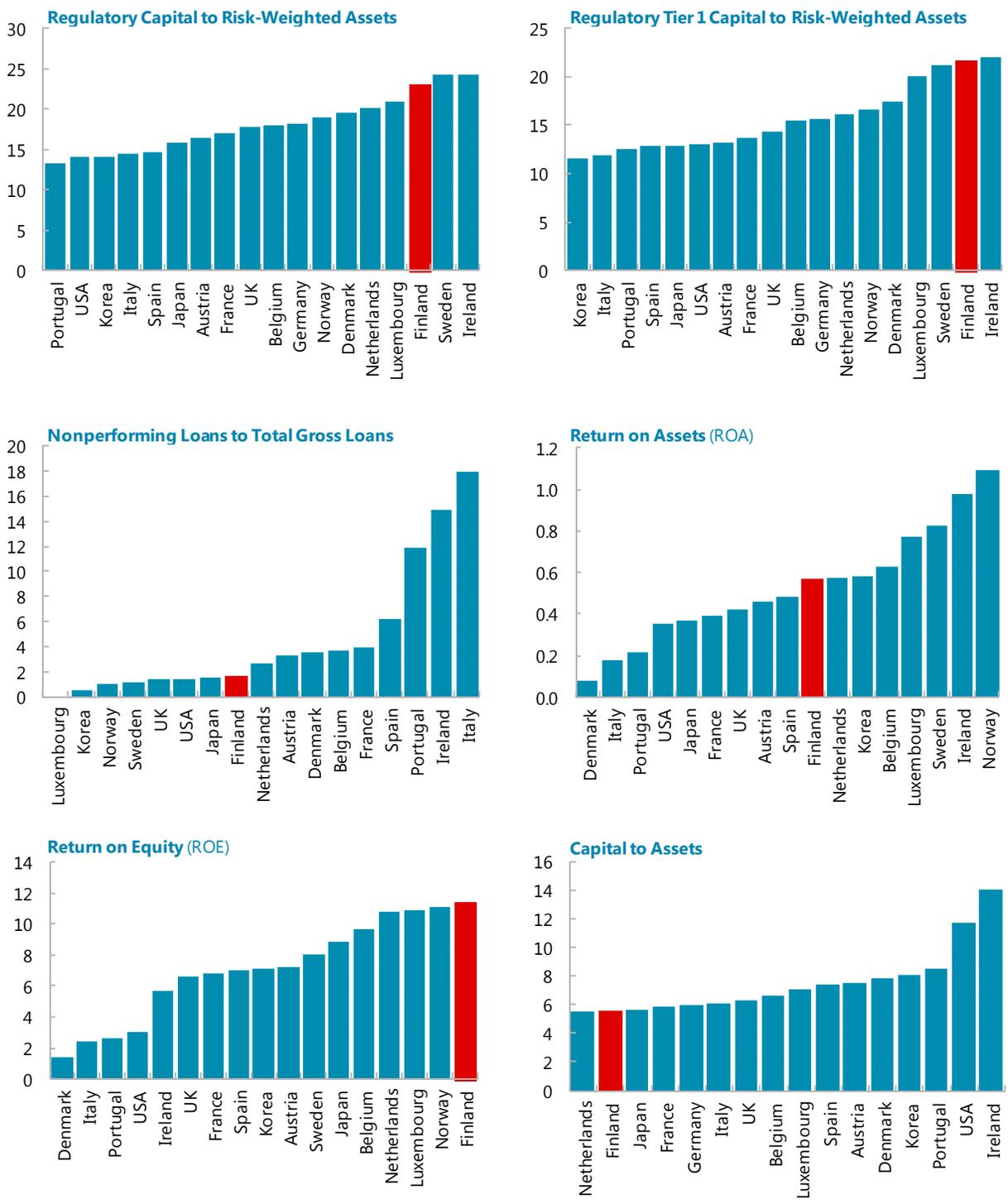
	2010	2011	2012	2013	2014	2015
Deposit-taking institutions 1/						
Regulatory capital to risk-weighted assets	14.4	14.2	17.0	16.0	17.3	23.1
Regulatory Tier I capital to risk-weighted assets	13.6	13.6	16.1	15.2	16.4	21.7
Nonperforming loans net of provisions to capital	5.1	5.5	5.7	5.3	12.4	10.7
Bank provisions to Nonperforming loans					32.4	30.7
Nonperforming loans to total gross loans	0.68	0.62	0.58	0.52	1.6	1.6
Sectoral distribution of loans to total loans, of which						
Deposit-takers	6.9	6.8	7.1	7.0	7.5	7.2
Nonfinancial corporation	14.7	14.1	14.1	13.6	12.6	12.3
Households (including individual firms)	37.5	35.4	37.3	36.6	36.7	35.0
Other residents	9.2	13.0	12.5	8.3	10.7	13.2
Nonresidents (including financial sectors)	31.8	30.8	29.0	34.4	32.5	32.4
ROA (aggregated data on a parent-company basis) 2/	0.5	0.5	0.5	0.5	0.5	0.6
ROE (aggregated data on a parent-company basis) 2/	9.2	10.1	10.8	9.8	11.3	11.5
Interest margin to gross income	42.9	46.6	41.6	41.6	41.7	38.9
Noninterest expenses to gross income	62.3	60.9	64.4	71.8	60.5	58.3
Liquid assets to total assets	6.8	6.8	14.6	14.9	14.3	16.4
Liquid assets to short-term liabilities					16.8	19.4
Net open position in foreign exchange to capital						
Net open positions in FX (in millions of EUR)						
Net open positions in equities to Tier I capital					19.2	16.1
Loans to the public / Deposits from the public excl. Repos					129.8	124.0

1/ FSI is calculated based on deposits taking institutions, excluding non-deposit taking credit institutions.

Source. FIN-FSA and Fund staff calculations.

**Figure 9. Selected Countries: Financial Soundness Indicators, 2015**

(in percent)

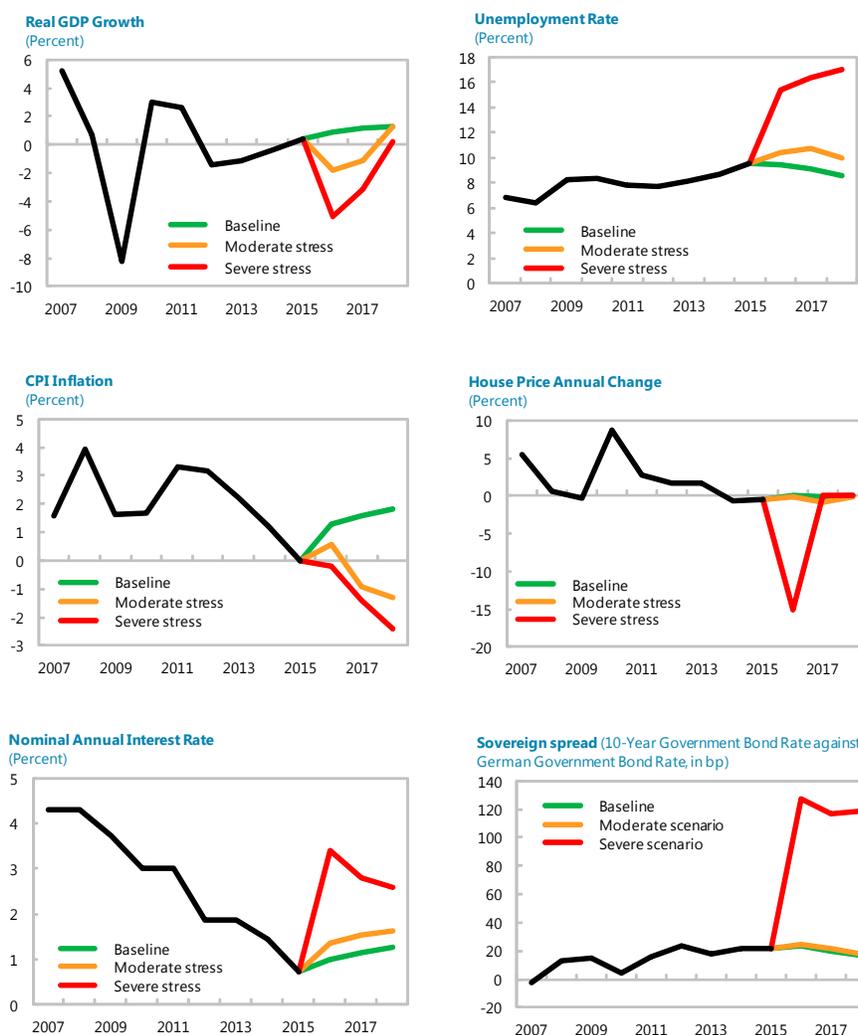


Sources. Finnish authorities, IMF Financial Soundness Indicators database, and Fund staff calculations.

**17. Under the severe adverse scenario banks’ solvency ratios would decline significantly** (Table 6):

- Under a fully-loaded CRR definition, the aggregate Common Equity Tier 1 (CET1) ratio would drop to 8.3 percent (Figure 13), driven by funding costs (-6.4 percentage points of RWAs cumulatively), credit losses (-6.1 percentage points of RWAs), and the change in risk-weighted assets (-2.8 percentage points).<sup>7</sup> Two banks would see the CET1 ratio fall below the requirement of 4.5 percent, by 0.2 percent of GDP. Additionally, a third bank would need to use up part of its capital conservation buffer.

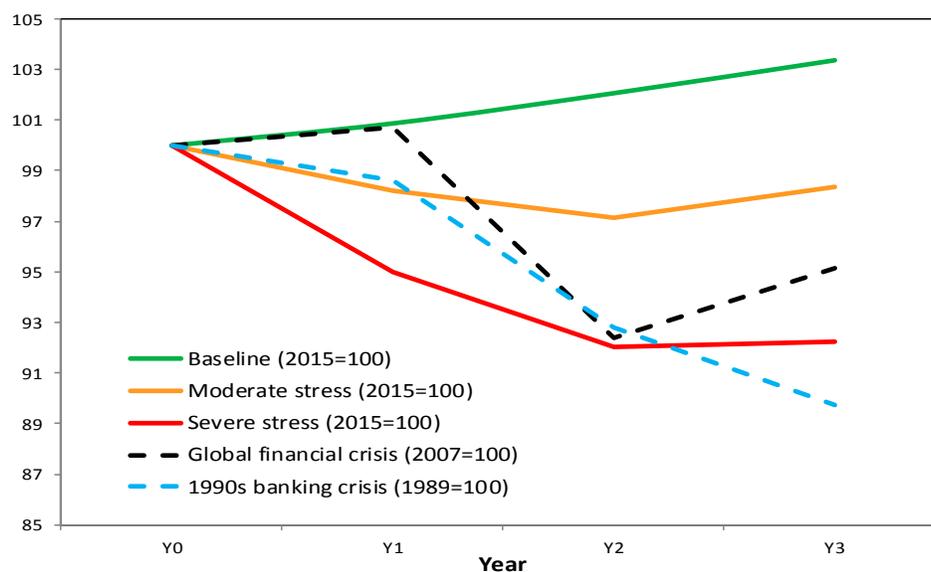
**Figure 10. Finland: Macroeconomic Baseline and Stress Scenarios**  
(Real GDP in year 0=100)



Source: IMF staff estimations.

<sup>7</sup> See Technical Note on Stress Testing the Banking System and Interconnectedness Analysis for more details.

**Figure 11. Finland: Scenario Severity from a Historical Perspective**  
(Real GDP in year 0=100)



Source. Fund staff calculations

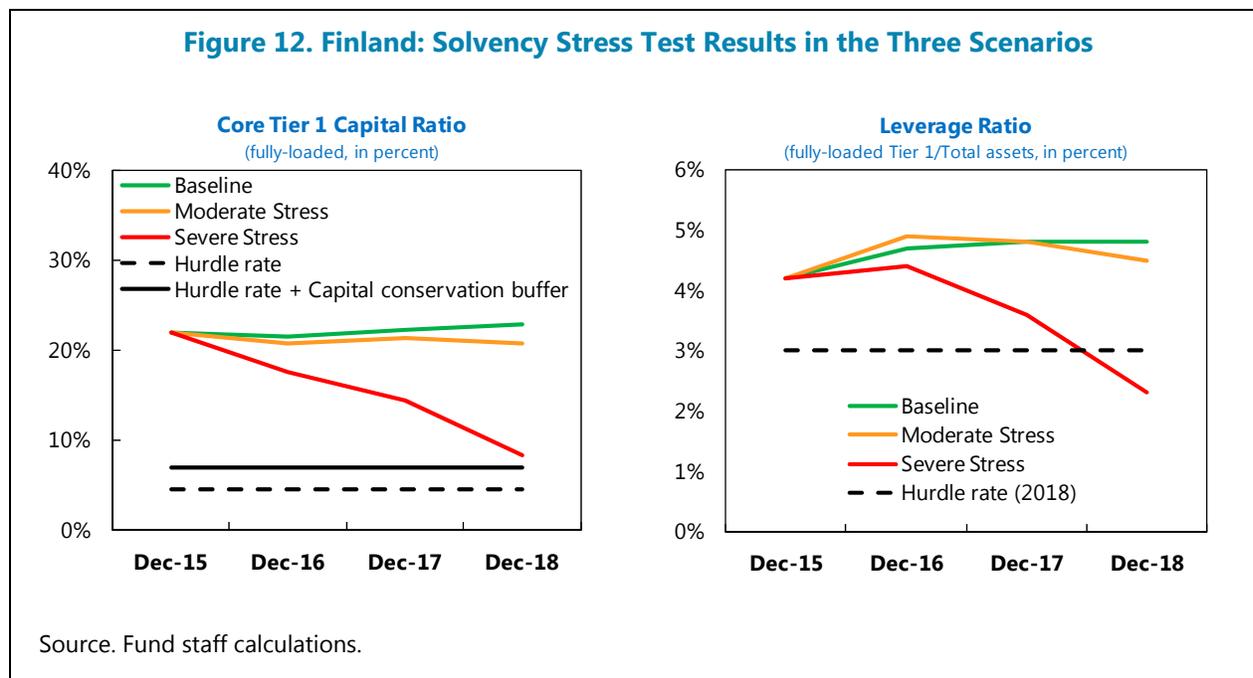
**Table 6. Finland: Results of the Top-Down Solvency Stress Test in the 3 Scenarios**

Scenario	Banking system's CET1 ratio (in percent)	Banking system's leverage ratio (in percent)	Number of banks with 6%<T1<8.5% (conserv. buffer)	Number of undercapitalized banks (CET1<4.5%)	Number of undercapitalized banks (leverage ratio<3%)	Max. capital shortfall in terms of CAR, T1, CET1 or leverage ratio (in percent of GDP)
<b>Baseline</b>	20.7	4.8	0	0	0	0
<b>Moderate stress</b>	20.0	4.5	0	0	0	0
<b>Severe stress</b>	8.3	2.3	1	2	4	2

Source. Fund staff calculations.

- The impact would be more severe based on the leverage ratio, with the aggregate ratio falling to 2.3 percent. The four banks' ratio would decline to below the hurdle rate of 3 percent in 2018, when it becomes binding, by an amount equivalent to 2 percent of GDP. The discrepancy between the risk-weighted capital ratios and the leverage ratio results suggests that banks' internal models may underestimate risks.

**Figure 12. Finland: Solvency Stress Test Results in the Three Scenarios**



**18. The sensitivity tests show that these results are robust to variations in risk factors.**

Finnish banks have comparatively small exposure to domestic sovereign risk (with the exception of one bank), to interest rate risk, foreign exchange risk and equity risk. The concentration credit risk test reveals that Finnish banks are adequately capitalized to absorb losses from the default of large exposures, though one bank relies heavily on financial guarantees and thus ultimately on the strength of its loans' guarantor.

**Bank Liquidity Stress Tests**

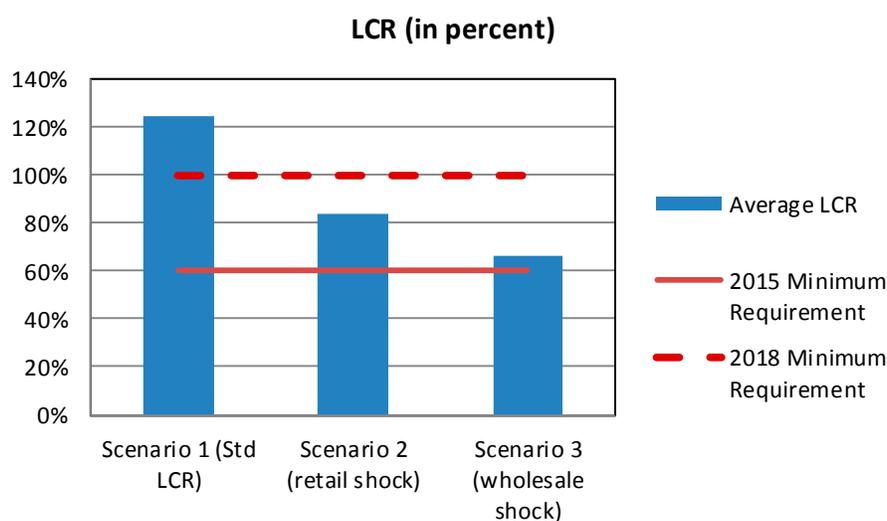
**19. The liquidity stress exercise considers the impact of three shock scenarios on banks' liquidity positions by currency across four metrics.** The three scenarios consider: (i) the standard Liquidity Coverage Ratio (LCR) tests at a 30-day horizon; (ii) a retail shock with large retail deposit withdrawals; and (iii) a complete dry-up of unsecured wholesale funding as experienced during the 2008 crisis. The exercise analyzes the impact of these shocks on the following parameters: (i) the LCR with variants;<sup>8</sup> (ii) the Basel III net stable funding ratio (NSFR); (iii) cash-flows based on different maturity buckets; and (iv) a "reverse liquidity" stress test to identify the conditions under which significant banks would fail pre-defined liquidity requirements.

**20. Vulnerabilities to wholesale funding shocks are significant and the authorities should ensure adequate liquidity cushions are maintained.** All banks meet the standard LCR test with withdrawal rates of 25-40 percent of different types of unsecured wholesale funding (Figure 13). If, however, unsecured wholesale funding were to be withdrawn entirely, the aggregate LCR would fall to 66 percent and the resulting total liquidity shortfall relative to the 2018 minimum requirement

<sup>8</sup> Liquidity Coverage Ratio in accordance with the European Commission Delegated Regulation (EU) 2015/61.

would amount to €45 billion (22 percent of GDP). Separate LCR-liquidity stress tests carried out on foreign currency positions reveal shortfalls in two banks ranging between 0.5 and 1.4 percent of GDP. The liquidity stress test results based on the Basel III NSFR suggest that there would be a liquidity shortfall of €25.4 billion. Finally, the cash flow-based analysis by maturity buckets shows that the banking system as a whole would not have enough buffers to counterbalance net outflows at one maturity bucket (16 to 30 days). In case of emerging imbalances, the authorities should take action to ensure that adequate liquidity cushions are maintained.

**Figure 13. Finland: LCR-based stress test results**



Source: FIN-FSA and Fund staff calculations

**21. Banks would be somewhat more resilient to retail deposit withdrawals.** With an increase in the withdrawal rate of stable retail deposits from 5 percent to 20 percent and of less stable retail deposits from 10 percent to 30 percent compared to the standard LCR, the total liquidity shortfall would amount to €17 billion (8 percent of GDP). Under a reverse liquidity stress test, the withdrawal rates of retail deposits alone would need to be very high (30 to 40 percent) to lead the system-wide LCR liquidity ratio to fall below 100 percent (Table 7).

**Table 7. Finland: Summary of the Liquidity Stress Test Results**

	LCR - Delegated Act	LCR Scenario with retail shock	LCR Scenario with wholesale shock	LCR - foreign currencies	NSFR	Outflow Analysis
System-wide Liq. ratio (in percent)	124	84	66	17/158	113.9	-
Liquidity shortfall 1/ EUR billions	0.0	16.9	45.4	1.1/3	25.4	1.7
as a percent of GDP	0.0	8.2	21.9	0.5/1.4	12.3	0.8

Sources: Fin-FSA and IMF staff calculations

Note: 1/ Liquidity shortfall is the amount required so that the Liq. Ratio in each bank in the system be equal to or above 100 percent.

For the LCR in foreign currencies a range of results is presented as results depend on the currency considered.

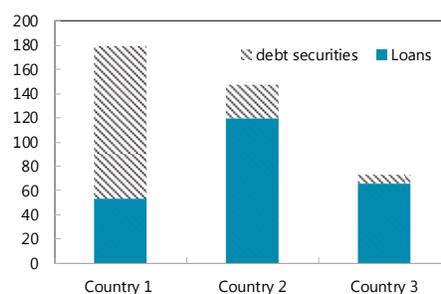
### Household Stress Tests

**22. A separate household stress test used micro-level data assessed the sensitivity of their balance sheet to macroeconomic shocks.** Household stress test results suggest that households are particularly vulnerable to a drop in incomes. Specifically, a drop combined with shock to real estate prices led to an increase in implied households' PDs from the current 3.9 percent (as estimated using micro data) to 13.6 percent (multiplier of 3.5).

### Contagion Analysis

**23. A sizeable portion of cross-border claims would need to be impaired for banks to become undercapitalized** (Figure 14). The minimum Tier 1 capital requirements (including the capital conservation buffer) of the most exposed banks would fall below the hurdle rate of 8.5 percent if about 40 percent of the payments from one country were not met. As expected, this scenario affects the subsidiaries of foreign-owned banks more than domestically-owned banks. Some of the largest banks in Finland share some of the largest single cross-border borrowers, raising systemic risk concerns if the credit quality of these entities deteriorates.

**Figure 14. Credit Risk: Cross-border Claims to Three Other Nordic Countries**  
(in percent of a bank's capital; maximum country exposure among the 4 largest Finnish banks)



Sources: Fin-FSA and IMF staff calculations.

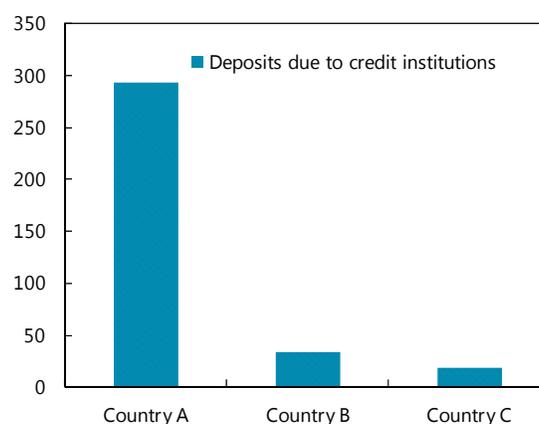
**24. A reversal of cross-border funding would cause a liquidity shortfall in some institutions** (Figure 15). A 34 percent reduction of cross-border funding from one country would deplete one bank's liquid assets. This may lead to adverse market dynamics with asset fire sales and solvency problems spilling over through the liquidity-solvency nexus.

**25. Analysis of market data confirms the strong linkages among the Nordics.** Evidence based on a variance decomposition of weekly changes of equity prices suggests that within the region Sweden and Finland share the strongest linkages (Figure 16).<sup>9</sup> These results corroborate the observed economic and financial ties in terms of cross-border trade, banking, and investment activity. In particular, this strong intra-regional connection results from regional banking activity and regional banks' extensive use of wholesale funding and large cross-holdings of covered bonds by banks, insurers, and pension funds.

<sup>9</sup> The Nordic region comprises Denmark, Finland, Iceland, Norway, and Sweden. See IMF working paper by Luis Brandao-Marques, Ben Huston and Marco Pinon: "Nordic Linkages" (forthcoming).

**Figure 15. Funding Risk: Cross-border Linkages with the Three Other Nordic Countries**

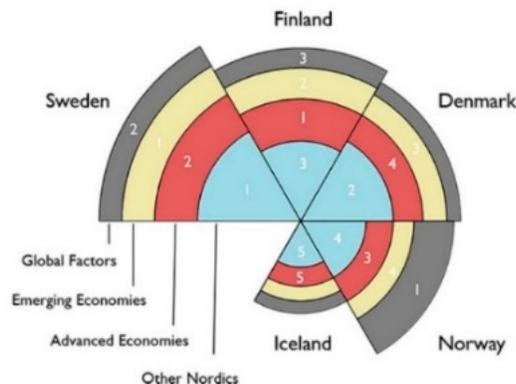
(in percent of a bank's liquid assets; maximum deposit-to-liquid assets ratio of the 4 largest Finnish banks)



Sources: Fin-FSA and IMF staff calculations.

**Figure 16. Finland: Linkages with the Nordic Region**

Among the Nordics, Sweden and Finland share the strongest implicit linkages, whereas those with Iceland are the weakest. Sweden's greatest links are to emerging economies and to other Nordics, while Finland is most strongly linked to developed countries elsewhere in Europe.



Sources: Thomson-Reuters Datastream and Fund staff calculations.

Note: Chart shows the ranking of each Nordic country's relative exposure to each linkage category. For example, Sweden is the Nordic country with the largest exposure to other Nordic countries while Norway is the most exposed to global factors. Results spans the period of 2010-16Q1.

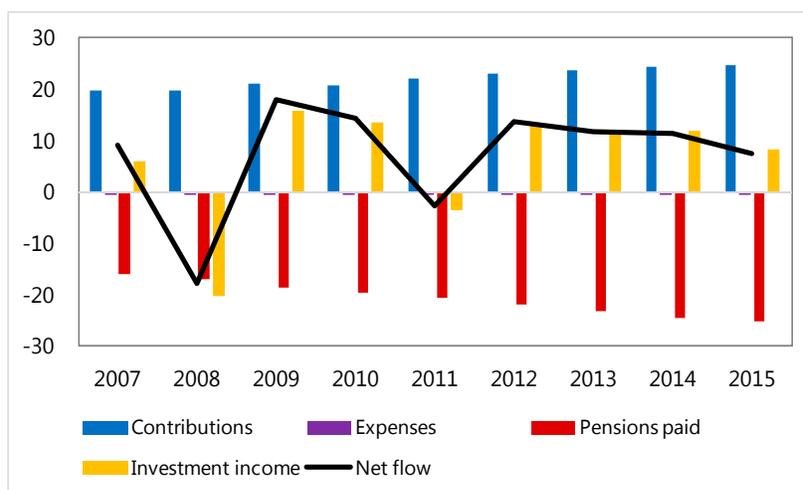
## C. Non-banks

**26. The potential for direct contagion risk arising from links between the non-bank and banking sectors appears limited, with reputational risk being the greatest concern.** Financial conglomerates have generally well-capitalized insurance operations and linkages to banks through bond and cash holdings and net counterparty exposures are modest. Insurers rely on banks for the distribution of their products and would be adversely affected if one suffered distress.

## Pension fund insurers

**27. Facing demographic and economic pressures, pension insurers have increased the riskiness of their investment portfolios.** The majority of compulsory and voluntary occupational pension schemes in Finland are financed by group insurance contracts. Employer based pension schemes have faced falling contributions and investment income and rising pensions (Figure 17). Investment managers have sought to generate higher long term returns by increasing the risk profile of investments, supported by the introduction of a complex equalization methodology that dilutes the impact of the market-risk based solvency requirement governing portfolio risk. A recent FIN-FSA test showed that the main pension insurers would breach their risk-based solvency margins under a severe shock scenario on account of equity losses. Accordingly, the authorities should monitor closely the riskiness of pension fund portfolios and their sensitivity to key assumptions through stress.

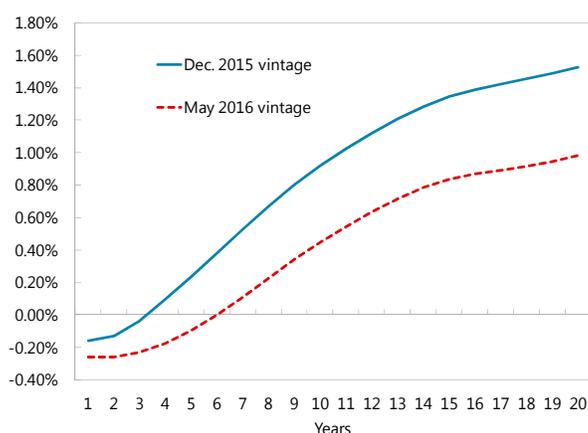
**Figure 17. Employment Based Pension Funds' Cash Flow**  
(Billions of euros)



Source. ETK data base and Fund staff calculations.

## Life insurers

**28. The prolonged period of low interest rates has hurt life insurers.** Although the sector has moved toward products without guaranteed returns, they still comprise 37 percent of sectoral technical provisions. The average required yield to meet capital guaranteed commitments is 2.3 percent, well above yields on the safest bonds. Moreover, continued declines in the risk free rates used as discount factors to calculate technical provisions are depressing insurers' own funds for supervisory oversight purposes (Figure 18). Six life insurers have been granted transitional solvency terms to meet Solvency II capital requirements (SCR), which became effective in early 2016. The vulnerability of life insurers with significant exposures to high guaranteed return products should be regularly tested with plausible shocks.

**Figure 18. EIOPA Risk-free Rate Yield Curve**

Sources: EIOPA and Fund staff calculations.

## FINANCIAL STABILITY POLICY FRAMEWORK

### A. Banking Supervision

**29. Finland has reinforced its regulatory and supervisory framework, including in the context of the transition to the Single Supervisory Mechanism (SSM).** Participation in the Banking Union allows Finland to reap the benefits of a mechanism that seeks to apply best international supervisory practices across Europe.

**30. FIN-FSA's resources should be increased.** The lack of a sufficient number of skilled and experienced staff is proving to be a constraint on the FIN-FSA's efforts to accommodate the more intense, intrusive and resource-intensive supervisory approach of the SSM on significant institutions (SIs). There is also a need to reinforce supervisory intensity of less significant institutions (LSIs), and to meet the increasing demands on macroprudential policy analysis, contingency planning and crisis management (described below). Hence, the FIN-FSA should increase its financial and human resources.

**31. The enforcement and sanctioning framework has been reinforced.** The powers have been expanded in the national legislation, including through the transposition of CRDIV. The SSM framework is based on a combination of powers assigned either to the ECB or the National Competent Authorities (NCAs). This complex arrangement has not been tested so far in Finland, though in practice until now there has been no sign that such complexity has deterred the authorities from taking action.

**32. The SSM Supervisory Review and Evaluation Process (SREP) is well structured, though the powers granted by Finnish legislation to the FIN-FSA do not appear aligned with those required by the CRD.** The SSM SREP framework emphasizes the analysis of banks' risks and the adequacy of levels of capital and liquidity. However, the FIN-FSA is more limited to impose supervisory measures than envisaged by the Directive. This impacts, for example, the FIN-FSA's

ability to impose supervisory measures for deficiencies in internal governance or to require an adjustment of provisions for prudential purposes.

**33. Supervisors need to be vigilant regarding possible overestimation of capital levels and underestimation of risk-weighted assets.** Recent on-site inspections revealed that banks are finding it difficult to classify loans according to the high-level EBA definition of ‘non-performing’ and ‘forborne’ exposures. The risk of these exposures transitioning to a non-performing status may be limited at the current juncture, but the situation would deteriorate if there were a drop in borrowers’ financial resilience.

**34. The upcoming SSM review of internal models can help reintroduce adequate conservatism in banks’ IRB models, and should be accompanied by ongoing monitoring of models.** Risk weights for mortgage exposures applied by Finnish banks using IRB models are, on average, the lowest in Europe. The proposed floor on risk weights of mortgage exposures is to become effective by July 2017. The planned Targeted Review of Internal Models (TRIM) by the SSM should address the current aggressive use of banks’ IRB models and ensure comparability across the SSM. Following the review, it will be important to continue monitoring the use of internal models. Internal models for market and counterparty risk on derivative exposures also need to be reviewed and monitored.

**35. The regulatory and supervisory framework for liquidity and funding risk has improved since the last FSAP, but vulnerabilities persist.** Supervisory actions have mitigated vulnerabilities relating to wholesale funding (e.g., by improving the maturity structure). However, large cross-holdings of covered bonds among Nordic banks—favored by EU eligibility for High Quality Liquid Asset buffers used for the LCR—could become a particular source of contagion should a drastic correction in house prices materialize in the region. While supervisory action on individual banks address this supervisory concern, the systemic risks stemming from bond crossholdings have not been adequately addressed. Given its cross-border nature, it lends itself to a coordinated regional analysis and, if needed, action by the relevant supervisors (e.g., through collaboration in the supervisory colleges).

## B. Branchification

**36. Once Nordea converts its Finnish banking subsidiary into a branch, the Finnish authorities and the ECB would not have direct supervisory authority over a systemic institution** (Box 1). Under EU rules, prudential supervision of the branch’s operations, along with liquidity support and resolution, would shift to Sweden (planned for early 2017). The Finnish authorities and the ECB, as host supervisors, would continue to have access to information from the home supervisor and the branch. FIN-FSA will also participate in both the College of Supervisors and Resolution College because Nordea’s branch would likely be designated as ‘significant’ (over 2 percent of deposits in Finland) and Nordea expects to establish a Finnish mortgage subsidiary. However, the authorities’ powers to supervise Nordea’s banking operations in Finland are reduced under CRD IV once the subsidiary is converted to a branch. The Finnish authorities would need to place greater reliance on the capacity and willingness of the Swedish authorities to identify and address problems in the parent and its branches in a manner that would not adversely affect Finnish financial stability.

37. The concerns arising from Nordea's branchification could be mitigated, although not eliminated, through:

- **An updated multilateral supervisory MoU (under negotiation) with Sweden, the ECB and the other Nordic supervisors, enhancing the ability of the Finnish authorities/ECB to closely monitor and identify vulnerabilities of Nordea.** This should entail full access to supervisory information and participating in and initiating on-site inspections in close cooperation with the home supervisor. Finland could then use its role in the College of Supervisors to promote a conservative and intensive ex ante approach to supervision and regulation. The MoU could also provide for the Swedish authorities to use existing supervisory resources in Finland, Denmark, Norway, and the ECB, to inspect and monitor the financial health of Nordea; and
- **The use of cooperative agreements** among the Nordic central banks and the ECB to provide liquidity support to Nordea in the event of a crisis. An alternative resolution strategy by Finland is required in case the original Swedish resolution plan cannot be executed.
- **Over the longer term, consideration of how the CRD could be amended.** The original objective of encouraging the free flow of financial services within the EU should be maintained. Nevertheless, in the case of systemically important branches, further thought could be given to how host supervisors could be provided with adequate authority in close collaboration with the home supervisor.

#### Box 1. The Impact of Nordea's Change in Legal Structure Finland

**Nordea Bank Finland (NBF) is the largest bank in Finland and will remain systemically important even if it converts to a branch.** NBF is designated as a Significant Institution by the ECB and its parent as one of the 30 globally systemically important banks (G-SIB) by the Financial Stability Board. Under current plans, Nordea's presence in Finland would be significantly reduced.

**The proposed conversion of NBF to a branch is likely to have at least three major implications:**

- **Adequacy of supervisory resources.** The shift will significantly increase the demand on the Swedish FSA's resources, and lower the FIN-FSA's fee income because FIN-FSA is funded on a fee-based model, with fees applied to supervised entities incorporated in Finland (but not to the same extent to Finnish branches of foreign banks). The transfer of the in-depth knowledge and experience of current supervisory teams to the Swedish FSA will be challenging. To the extent that the Swedish FSA has a shortage of experienced bank supervisors (as noted in the recent Sweden FSSA), Nordea's branchification may exacerbate the problem.
- **Depositor protection.** The protection of Finnish customers of Nordea will shift from Finland's deposit guarantee scheme (DGS) to that of Sweden. The effectiveness of these arrangements could only be judged when tested, especially given the significant increase in Nordea's balance sheet in Sweden.
- **Bank Resolution.** In the event that Nordea's operations encounter difficulties, responsibility for its resolution will rest with the Swedish authorities.

## C. Non-Bank Supervision

**38. While the legal infrastructure for insurers and pension funds is in line with EU Directives, employment based pension funds were granted a derogation and are governed under Finnish law.** This law is still incomplete as the operation of regulatory ladders and resolution procedures for distressed pension funds are not clearly spelled out and have had to be managed on an ad hoc basis to date.<sup>10</sup> Priority should be given to rectifying this statutory weakness.

**39. The FIN-FSA has a best practice insurance supervisory model but resources should be strengthened in line with the increased international requirements.** The introduction of Solvency II in early 2016 has put considerable pressure on the insurance supervision team, including through the need to carry out supplementary group and financial conglomerate supervision. In practice, significant responsibility for implementation of the new regime has rested with the insurers' appointed actuaries and risk managers. Resources need to be increased to deal with more than one pension insurer requiring enhanced supervision at a time. In addition, FIN-FSA's board and senior management would benefit from additional insurance expertise.

**40. Enhancements to fund management supervision are needed, supported by sufficient resources.** To further increase efficiency, different processes for the review of various investment fund types could be applied, differentiated on investor protection and financial stability grounds. Emphasizing the importance of firms' own governance, controls and risk management through FIN-FSA's supervision is important. Given the extent of cross-border fund management and marketing in the Nordic region, it is important to continue to build closer Nordic cooperation to conduct joint supervision, where appropriate. FIN-FSA should also actively raise issues for discussion at the European Securities and Markets Authority to enhance EU level convergence.

**41. The authorities should focus their oversight on the significant long term social insurance liabilities.** The present value of deferred liabilities should be estimated periodically and an actuarial peer review system could focus on non-life long tail statutory technical provisions. Bringing external auditors into the Solvency II process (through their internal actuarial staffs) would be in line with the EIOPA guideline.

**42. The FIN-FSA should monitor fund managers' risk management processes and enhance its ability to use reported data to analyze risks and supervise cross-market and cross-border trading.** The fund management sector has grown rapidly in the last decade and is highly diversified. Insurers hold over a quarter of domestic funds. At end-February 2016, 28 percent of funds were invested in Finland and 57 percent in the euro area. Funds sold in Finland tend to be unleveraged, without active derivative trading. Major fund managers have appropriate risk management processes, but some smaller ones have riskier structures. Resources at the FIN-FSA should be sufficient to assess all fund managers' risk management processes. FIN-FSA should also leverage on the existing investment fund data and systematically compile other supervisory data to support its

<sup>10</sup> The regulatory ladder is the sequence of supervisory interventions that occur as an institution breaches defined solvency levels.

risk analysis and targeting of supervisory activities. Less than 40 percent of trading in Finnish issuers' shares takes place in Finnish trading platforms. To effectively supervise such trading in the current fragmented trading environment, FIN-FSA should acquire an automated market surveillance system.

## D. Macroprudential Policy Framework

### 43. The macroprudential mandate is shared between the Finnish authorities and the ECB.

A domestic framework was formalized in 2014, designating the FIN-FSA as the authority to implement a set of macroprudential instruments, and establishing a coordination mechanism among domestic authorities, including the BoF and the MoF. With the start of the SSM in 2014, the ECB was designated as a macroprudential authority for the euro area, with the European Systemic Risk Board (ESRB) continuing to play an advisory role for all EU countries. The BoF and FIN-FSA also regularly discuss financial stability risks with Nordic and Baltic counterparts in the Nordic Macroprudential Forum.

**44. At the national level, the new institutional arrangement appears to work well with a high level of *de facto* interagency collaboration.** The BoF and the FIN-FSA jointly conduct systemic risk monitoring. They prepare vulnerability analyses and preliminary recommendations, based on which the FIN-FSA Director General makes proposals to the Board on the implementation of macroprudential tools. Since the introduction of the Act on Credit Institutions in 2014, the Board designated four banks as systemically important and subjected them to additional capital requirements from January 2016. A loan-to-collateral cap for housing loans became effective as of mid-2016. Other instruments in the toolkit, including the counter-cyclical capital buffer, have not been activated given inconclusive evidence on heightened systemic risks. The planned introduction of a floor on risk weights for housing loans is a recognition of heightened vulnerabilities.

### 45. Despite the important progress made, there are improvements that should be considered.

- **Institutional arrangement:** The FIN-FSA's mandate is narrowly defined over the use of explicitly approved tools by laws. Clarification of a broader macroprudential policy mandate in the law would strengthen accountability and thus the willingness and ability to act. The FIN-FSA's human resources for macroprudential policy should be expanded to strengthen its capacity in line with the new mandate. In addition, consideration should be given to formalize (i) the chairmanship of the BoF representative in the decision making meetings, and (ii) the staff-level cooperation framework among the FIN-FSA, the BoF and the MoF for macroprudential policy.
- **Data.** A loan registry system should be created to fill a data gap related to the household indebtedness at a disaggregated level. This would help to better target relevant systemic risks and calibrate tools.
- **Toolkit.** The authorities should have a broader range of tools at their disposal. The systemic risk buffer should be added to the toolkit, although its activation and level may still need further analysis. In addition, in light of potential cross-border leakages for capital based tools and risks

in the household sector, tools based on the terms of loans (such as maximum maturity limit) and borrowers' eligibility (such as caps on loan-to-income or debt-service-to-income ratios) and their complementary use should be considered.

- **Regional cooperation.** The authorities should seek to further strengthen regional cross-border cooperation arrangements. Considering the high interconnectedness within the Nordic region and the reduced influence by host supervisors on regional bank branches' operations, strengthening the collaboration of supervisory authorities in the region is desirable, in particular, in the area of supervisory information sharing and joint stress-testing.

## E. Anti-Money Laundering/Countering the Financing of Terrorism

**46. Finland has made good progress in strengthening its anti-money laundering and countering the financing of terrorism (AML/CFT) framework and is taking steps to implement the 2012 standard.** Most of the main deficiencies identified in Finland's 2007 mutual evaluation report have been addressed. Finland has, in particular, strengthened the money laundering (ML) offense (including by criminalizing some instances of self-laundering), terrorist financing (TF) offense, and AML/CFT controls. Minor deficiencies nevertheless remain. The authorities are taking steps to implement the Financial Action Task Force (FATF) 2012 standard and the Fourth EU AML Directive. Draft changes include setting up a register of owners and beneficial owners of Finnish legal entities, implementing a greater risk-based approach, and strengthening supervision and sanctions for non-compliance with AML/CFT requirements. Finland recently conducted its first ML/TF national risk assessment in consultation with different agencies and the private sector.<sup>11</sup> It highlights key ML/TF risks arising from, among others, the transportation of cash and front companies. The authorities intend to conduct an update in 2017, ahead of Finland's 2018 AML/CFT assessment.

**47. Legislative reforms should take into account the current standard and Finland's main ML/TF risks.** The authorities should, in particular, ensure that adequate, accurate and up-to-date information on beneficial ownership and control of Finnish legal entities is available to the competent authorities in a timely fashion, and that effective AML/CFT controls are in place to mitigate the risk emanating from cross-border remittances. They are also encouraged to ensure that the ML and TF offenses and the mechanism to freeze terrorist assets are fully in line with the standard, and that all reporting entities, including lawyers, are subject to effective AML/CFT supervision.

<sup>11</sup> The Finnish report (and its summary in English on page 7) was published in October 2015 and can be found at: [http://www.polamk.fi/en/rdi/projects/archives/national\\_risk\\_assessment\\_of\\_money\\_laundering\\_and\\_terrorist\\_financing](http://www.polamk.fi/en/rdi/projects/archives/national_risk_assessment_of_money_laundering_and_terrorist_financing)

## CONTINGENCY PLANNING AND CRISIS MANAGEMENT

**48. Finland's contingency planning and crisis management (CPCM) framework, including bank recovery and resolution, has improved in recent years.** The establishment of the Banking Union brought about fundamental changes in the institutional framework with the SSM and the Single Resolution Mechanism (SRM), introduced direct ECB supervision over systemic banks, and made systemic banks subject to recovery and resolution planning. This complemented previously introduced EU-wide systemic risk monitoring through the ESRB. At the same time, Finland has introduced a host of new legislation and established a national resolution authority (the FFSA). It has also revised its deposit insurance system.

**49. Finland's CPCM framework rests on strong foundations.** In addition to the new EU framework, the track record of good cooperation between its financial oversight agencies could facilitate coordination in times of crisis. Furthermore, the Finnish financial oversight architecture ensures functional separation between potentially conflicting CPCM functions: supervision, resolution, and emergency liquidity support. This helps crisis preparedness: proper execution of each function helps for the agencies to be collectively prepared for a crisis. Lastly, Finland has a strong tradition of testing system-wide operational risks, including a recent test.

**50. However, Finland's CPCM framework is untested and actions are needed to ensure operational capacity to rapidly deploy recovery and resolution tools.**

- Additional resources are needed because of extensive consultations at EU levels, at a time when the Finnish financial oversight agencies have been undergoing rationalization of their resources. Moreover, with fee revenues of the supervisory and resolution authorities expected to decrease substantially, the authorities should ensure adequate and sustainable financial and human resources for all financial oversight agencies.
- The authorities should strengthen the legal and operational framework for legal protection of officials, staff, and agents of the agencies. The central bank's balance sheet should be bolstered with indemnification arrangements against potential exposures due to emergency liquidity assistance during crises and under strategies for liquidity support in resolution.
- The MOF is responsible for strategic guidance on financial policies and considers itself responsible for overall stability. However, the responsibility to actively oversee national crisis preparedness and management, including communication planning and regular financial crisis simulation exercises, has not been clearly assigned at the national level. This could possibly be done with an expanded mandate for the existing FFSA Advisory Council, where member agencies cooperate in responding to financial crises, while each agency would continue to exercise their individual powers.

**51. Cross-border arrangements should be clarified to effectively support Finland’s CPCM framework.**

- With the SRM involving a host of national and European officials, it could delay European-level decision making. Relatedly, the responsibility—and possible role for the ECB and the Single Resolution Board—to actively oversee collective crisis preparedness and management at the level of the Banking Union should be defined.
- In light of the significant linkages, close CPCM cooperation among Nordic countries would be desirable. A revamped Nordic-Baltic Stability Group (NBSG) could be a useful platform for this; supported by MoUs between the Finnish agencies and their Nordic-Baltic counterparts on pertinent issues within their respective mandates, the NBSG could oversee cross-border crisis preparedness and management, and organize regular cross-border CSEs.
- Legal and operational clarification is needed to ensure effective application of temporary liquidity support in resolution. In the medium term, Finland would benefit when Banking Union is completed, including a common SRM-wide deposit insurance scheme and permanent, common bank-stop funding arrangements for the EU Single Resolution Fund.

## Appendix I. Risk Assessment Matrix

Source of Risks	Overall Level of Concern	
	Relative Likelihood (high, medium or low)	Expected Impact (high, medium or low)
<b>I. Sharp rise in risk premia with flight to safety and protracted uncertainty associated with negotiating post-Brexit arrangements</b>	<p>Medium</p> <p>As a euro area member, Finland could be affected if sovereign and financial sector stress reemerges across the Euro area due to protracted policy uncertainty and/or events related to Greece. Protracted uncertainty associated with negotiating post-Brexit arrangements could weigh on confidence and investment more than expected—most prominently in the UK and the rest of Europe with possible knock-on effects elsewhere. Increased barriers could also dampen the longer-run economic performance of affected countries more than expected.</p>	<p>Medium</p> <p>Finland is a core euro area member and its sovereign yields generally track German yields. Severe financial market stress could cause bank losses and funding difficulties, which could lead to curtailed lending, with negative effects on growth.</p> <p>The direct impact of the UK departure from the EU on Finland is expected to be limited, though it could affect transactions involving central clearing counterparties in the UK. There could also be an indirect impact through Finland's membership in the EU.</p>
<b>II. Structurally weak growth in key advanced and emerging economies.</b>	<p>High</p> <p>Finland's exports are tightly linked to Euro area markets.</p>	<p>High</p> <p>With domestic demand already anemic, external demand will wane further, pushing Finland into a period of economic stagnation. Finland's direct trade exposure to emerging markets is more limited but the country might be affected by a contraction of world demand, trade, and foreign investment.</p>
<b>III. Heightened risk of fragmentation/security dislocation in part of the Middle East, Africa, and Europe, leading to a sharp rise in migrant flows, with negative global spillovers.</b>	<p>Medium</p> <p>Russia is Finland's fifth largest export market. Negative effects from a renewed increase in geopolitical tensions could spillover through further reductions in trade.</p>	<p>Low</p> <p>Depending on the severity of a downturn in Russia and exchange rate depreciation, the reduction in trade in goods and services could shave as much as a couple tenths of a percent of GDP growth.</p>
<b>IV. Adverse macroeconomic and house price shock in an interconnected neighboring Nordic country.</b>	<p>Medium</p> <p>Household debt is high in the Nordics due to easy access to credit, low interest rates, and tax incentives for housing. Property prices remain elevated. The two largest banks in Finland are Swedish and Danish.</p>	<p>Medium</p> <p>Declining in demand from other Nordics would lower growth. Rising nonperforming loans and funding costs for Swedish or Danish banks could translate into curtailed lending in Finland, with negative effects on investment and housing.</p>
<b>V. Persistently lower energy prices, triggered by supply factors reversing more gradually than expected.</b>	<p>Low</p> <p>Continued global oil production in excess of oil consumption leads to an expectation of long-lasting low price levels, as currently suggested in futures markets.</p>	<p>Medium</p> <p>Lower oil prices could further reduce inflation and inflation expectations, lead to high savings and lower investment given slower decline in private debt burdens. Conversely, an increase in commodity prices due to oil supply disruptions and geopolitical tensions in the Middle East would dent households' purchasing power, reduce firms' profitability and dampen the economic recovery.</p>

## Appendix II. Banking Sector Stress Testing Matrix (STeM)

Domain		Top-down Stress Test by FSAP Team - Assumptions
<b>Banking Sector: Solvency Risk</b>		
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> <li>4 banks</li> </ul>
	Market share	<ul style="list-style-type: none"> <li>93 percent of MFI's assets</li> </ul>
	Data and baseline date	<ul style="list-style-type: none"> <li>Publicly-available and set of supervisory data</li> <li>Baseline date: end- December 2015</li> <li>Bank consolidated level data for banks having their headquarters in Finland and sub-consolidated level data for the subsidiaries of foreign banks.</li> <li>Market-data</li> </ul>
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> <li>Satellite models developed by the FSAP team</li> <li>Balance sheet-based approach</li> <li>Market data-based approaches</li> </ul>
	Satellite Models for Macro-Financial linkages	<ul style="list-style-type: none"> <li>Models for credit losses, pre-impairment income, credit growth; expert judgment</li> <li>Models to integrate solvency-funding interactions</li> <li>Methodology to calculate sovereign risk</li> <li>Methodology to calculate losses from bonds and money market instruments (sovereign and other issuers). Haircuts are calculated based on a modified duration approach.</li> <li>Net fee income and commission income projected based on nominal GDP growth and expert judgment.</li> <li>No accrued income on NPL loans.</li> </ul>
	Stress test horizon	<ul style="list-style-type: none"> <li>3 years (2016/2018)</li> </ul>
3. Tail shocks	Scenario analysis	<ul style="list-style-type: none"> <li>Scenario-based tests, which assess the impacts on the entire portfolio including the loans and, if applicable, the trading book, were conducted in the TD exercise.</li> <li>Variables in the scenarios include domestic macro- financial variables (e.g., GDP, inflation), and GDP for key trading partners, interest rates, and real estate prices.</li> <li>In the Finland-specific adverse scenario, the GDP growth rate declines to -5.0, -3.1 and +0.2 percent, in 2016, 2017 and 2018 respectively.</li> <li>A set of market shocks, including large and sudden changes in interest rates and exchange rates, is calibrated to magnitudes close to those observed in 2008/2009.</li> </ul>
	Sensitivity analysis	<ul style="list-style-type: none"> <li>Sensitivity analyses were conducted in the TD exercises.</li> <li>They evaluate <i>domestic</i> shocks: direct effects of interest rate shocks; interest rate shock on credit quality; direct effects of exchange rate shocks; a decline in the prices of sovereign</li> </ul>

		bonds; and failure of the largest to 10 largest corporate exposures.
4. Risks and Buffers	Risks/factors assessed.	<ul style="list-style-type: none"> <li>• Credit losses</li> <li>• Losses from bonds and money market instruments (sovereign and other issuers) in the banking and trading books</li> <li>• Funding costs</li> <li>• Market risk, including foreign exchange risk</li> </ul>
	Behavioral adjustments	<ul style="list-style-type: none"> <li>• Balance sheet grows with nominal GDP.</li> <li>• Dividends are paid out by banks that remain adequately capitalized throughout the stress. Dividend payout ratio is determined using historical data.</li> </ul>
5. Regulatory and Market-Based Standards and Parameters	Calibration of risk parameters	<ul style="list-style-type: none"> <li>• Through the cycle and Point-in-time for credit risk parameters or proxies</li> </ul>
	Regulatory/Accounting and Market-Based Standards	<ul style="list-style-type: none"> <li>• European and national regulation</li> <li>• Basel II IRB approach + Basel III</li> </ul>
6. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> <li>• System-wide capital shortfall</li> <li>• Number of banks and percentage of banking assets in the system that fall below certain ratios.</li> </ul>
<b>Banking Sector: Liquidity Risk</b>		
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> <li>• 4 largest banks in the system</li> </ul>
	Market share	<ul style="list-style-type: none"> <li>• 93 percent of MFI's assets</li> </ul>
	Data and baseline date	<ul style="list-style-type: none"> <li>• Latest data: December 2015.</li> <li>• Source: supervisory data</li> <li>• Scope of consolidation: perimeter of individual banks</li> </ul>
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> <li>• Basel III-LCR and NSFR type proxies, based on European Commission Delegated Act</li> <li>• Cash-flow based liquidity stress test using maturity buckets by banks</li> <li>• Reverse liquidity test by banks</li> </ul>
3. Risks and Buffers	Risks	<ul style="list-style-type: none"> <li>• Funding liquidity (liquidity outflows)</li> <li>• Market liquidity (price shocks)</li> </ul>
	Buffers	<ul style="list-style-type: none"> <li>• Counterbalancing capacity</li> <li>• Central bank facilities</li> </ul>
4. Tail shocks	Size of the shock	<ul style="list-style-type: none"> <li>• Run-off rates calculated following historical events and LCR/NSFR rates</li> <li>• Bank run and dry up of wholesale funding markets, taking into account haircuts to liquid assets</li> </ul>
5. Regulatory and Market-Based Standards and Parameters	Regulatory standards	<ul style="list-style-type: none"> <li>• European Commission Delegated Regulation (EU) 2015/61; and Basel Committee on Banking Supervision (2014), "Basel III: The Net Stable funding ratio" Basel, October.</li> </ul>

6. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> <li>• Liquidity gap by bank, and aggregated.</li> <li>• Survival period in days by bank, number of banks that can still meet their obligations</li> </ul>
<b>Banking Sector: Contagion Risk</b>		
1. Institutional Perimeter	Institutions included	<ul style="list-style-type: none"> <li>• 4 banks</li> <li>• Bank, insurance company and real estate investment trust sectors stock indices</li> </ul>
	Market share	<ul style="list-style-type: none"> <li>• 93 percent of MFI's assets</li> </ul>
	Data and baseline date	<ul style="list-style-type: none"> <li>• Latest data: December 2015.</li> <li>• Source: supervisory and market data</li> <li>• Scope of consolidation: perimeter of individual banks</li> </ul>
2. Channels of Risk Propagation	Methodology	<ul style="list-style-type: none"> <li>• Network interbank model by Espinosa-Vega and Solé (2010)</li> <li>• Diebold-Yilmaz variance decomposition connectedness methodology</li> <li>• Data-driven correlation networks</li> </ul>
3. Tail shocks	Size of the shock	<ul style="list-style-type: none"> <li>• Pure contagion: default of institutions</li> <li>• Spillover index and transmission</li> </ul>
4. Reporting Format for Results	Output presentation	<ul style="list-style-type: none"> <li>• Number of undercapitalized and failed institutions, and their shares of assets in the system</li> <li>• Evolution and direction of spillovers within the network</li> </ul>

## Appendix III. Status of the Recommendations of the 2010 FSAP

Recommendations	Status
<b>Financial stability analysis</b>	
Monitor bank mortgage pricing practices and household debt service capacity closely. Increase efforts to compile information on banks' mortgage portfolio, including loan-to-value (LTV) ratios. Frequency: annually	Implemented. Loan-to-value ratios have been monitored through two cross-sectional surveys in 2010 and 2012. Under legislation which came into force on July 1, 2016, banks have to report LTVs of new housing loans to the FIN-FSA on a quarterly basis.
Enhance the top-down stress testing framework by (i) modeling macrofinancial linkages on a bank-by-bank basis; (ii) further integrating bank and sectoral data; (iii) incorporating financial conglomerate dimension; and (iv) improving the synergies between the Bank of Finland's (BoF) Research and Financial Stability Divisions and the FIN-FSA. Exercise can be conducted quarterly.	Implemented. Macrofinancial modeling linkages, annual top-down stress testing exercises, and close cooperation between the FIN-FSA and the BoF. Under way: improvement of existing models including liquidity stress tests. Since the establishment of the SSM in 2014, the ECB TD models, which include macrofinancial linkages, have played a bigger role in euro area banking sectors' stability oversight.
Make available quarterly core financial soundness indicators using the data dissemination system already in place.	Implemented. Information regarding capital adequacy, profitability, and credit risks are published by the FIN-FSA on a quarterly basis. The BoF publishes financial risk indicators (macroprudential report annex)
Enhance the current framework to assess systemic risk by: (i) using more detailed information on cross-border exposures; (ii) including all nonbank elements of the financial sector and cross-border linkages; (iii) establishing cross-border cooperation on systemic risk assessment with other authorities; and (iv) integrating the framework in the set of supervisory tools, to better feed into policy action.	Implemented: Regional MoU (2010); supervisory colleges set up that use detailed quarterly liquidity reports and closely monitor cross-border financial institutions. The authorities cooperate with other jurisdictions in the Nordic-Baltic Macroprudential Forum. In several stress tests conducted by the FIN-FSA and by the European authorities, risk of the nonbank elements of the financial sector has been assessed.
<b>Safety net</b>	
Set up a bank-specific resolution regime to enhance cost-effectiveness and speed of bank resolution.	Ongoing: A bank-specific resolution regime has been set up along with the implementation of BRRD and bank-specific resolution plans are being developed. The Act on Resolution of Credit Institutions and Investment Firms has been in effect from January 1, 2015.

<p>Use Core Principles for Effective Deposit Insurance Systems to evaluate and assure operational resources of the Deposit Insurance Scheme commensurate with needs.</p>	<p>Largely implemented on governance, protection of depositors, funding, coverage, and cooperation with other safety net participants, including central banks and supervisors. The Deposit Guarantee Scheme complies with EU regulations, though a specific evaluation of the new scheme has not been performed yet. The DGS is administered by the Finnish Financial Stability Authority, which began operations in 2015.</p>
<p><b>Supervision and regulation</b></p>	
<p>Improve FIN-FSA's supervisory powers to impose administrative fines and/or penalty payments beyond the current securities markets related scope; increase the maximum amount of such fines and penalties.</p>	<p>Implemented: The new Act on Credit Institutions, including new sanctioning powers, entered into force in August 14, 2014. This CRD IV implementation enhanced sanctioning powers to a great extent.</p>
<p>Increase the effectiveness of cross-border supervision, including information sharing with home supervisors with respect to the activity of foreign branches.</p>	<p>Largely implemented: Nordic/Baltic countries MoU (08/2010) on exchange of information, enhanced cooperation framework, and management and resolution of cross-border systemic crises. On the supervision of a non-Euro area banks with significant branches in Finland, the cross-border cooperation and the exchange of information can still be improved. The SSM also enhances cross-border supervision.</p>
<p>Increase the focus on liquidity risk, using the forthcoming liquidity standard of FIN-FSA as a catalyst for detailed analysis of supervised institutions' funding profiles.</p>	<p>Implemented: The new CRD 4 &amp; CRR regulatory framework including the LCR (Liquidity Coverage Ratio) is now in force improving supervisory powers. Focus on liquidity and funding has been steadily increasing over the years.</p>
<p>Further integrate procedures and practices of banking and insurance supervision, with a view to enhancing FIN-FSA's analysis of the (consolidated) risk profile of complex financial groups active in Finland.</p>	<p>Mostly implemented: Procedures and practices in supervision are integrated as much as it is possible taking into account certain differences of banking and insurance industries.</p>