Financial stability analysis at the Bank of Finland

Kimmo Virolainen[1]

1. Introduction

Central banks are generally considered to have two main tasks: maintaining price stability and promoting the stability and functioning of the financial system. The stability of the financial system, in particular the banking system, is critical for the successful conduct of monetary policy. More generally, a stable and reliable financial system is necessary for the stable and favourable performance of the economic system.

The Finnish banking system experienced a severe crisis in the early 1990s.[2] Resolution of the crisis involved public support for all the major banking groups in Finland. Although the bank support has been recovered to some extent due to favourable macroeconomic developments in the latter part of the 1990s, the current estimated net cost of the crisis to taxpayers amounts to approximately 7% of 1997 nominal GDP. As a result of the crisis, the attention of public authorities was drawn to various preventative measures for avoiding future crises of such magnitude. In practice, this is reflected in the reorganisation of prudential supervision of financial institutions so as to involve greater resources and a closer relationship with the central bank.

At the Bank of Finland, the banking crisis crystallised the need for careful monitoring and frequent projections of future developments in the profitability and solvency of the Finnish banking sector. This work laid the foundation for the systematic framework for macroprudential analysis that is currently carried out at the Bank.

This paper describes the Bank's financial stability framework. In particular, it discusses the experience gained in carrying out semiannual forecasts of the aggregate banking sector and the close links between the banking sector forecast and the Bank's macroeconomic forecast for the whole economy. The paper also attempts to identify ways to develop the banking sector forecast framework in order to enhance its applicability in the future. Finally, the paper discusses the interaction between the macroprudential analysis carried out at the central bank and the prudential supervision carried out by a separate but closely related body - the Financial Supervision Authority.

2. Components of macroprudential analysis at the Bank of Finland

At the Bank of Finland, the Financial Markets Department is responsible for financial stability analysis. In recent central bank parlance, the term "macroprudential analysis" has mainly been used to describe tasks aimed at promoting the stability of the banking sector, whereas the term "oversight" is usually understood to encompass tasks relating to financial market infrastructure, that is, payment and settlement systems. Moreover, the term "market surveillance" is sometimes used to describe the regular surveillance and analysis of securities markets by the central bank. Nevertheless, all of these tasks are important elements of the financial stability analysis carried out by a central bank and, at the Bank of Finland, the tasks of the Financial Markets Department encompass all of them. In what follows the terms "financial stability analysis" and "macroprudential analysis" are used interchangeably and should be understood to cover the financial stability tasks of a central bank in a wide sense.[3]

Analysis of the stability of the financial system is based to a large extent on combining quantitative and qualitative information and it makes use of data on overall economic developments and individual

---

1 The views expressed in this paper are those of the author and do not necessarily reflect the opinion of the Bank of Finland.

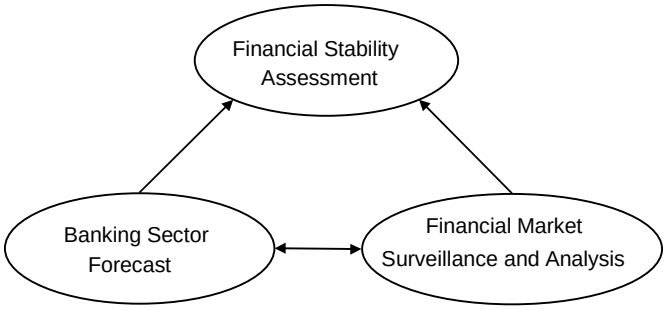
2 For a detailed description of the Finnish banking crisis, see eg Nyberg and Vihriälä (1994) or Koskenkylä (2000).

3 See Koskenkylä and Virolainen (1999) and Leinonen and Pauli (1999) for comprehensive descriptions of the Bank of Finland's activities in macroprudential analysis and oversight.

financial institutions. Macroprudential analysis at the Bank of Finland consists of three main components: (1) regular surveillance and analysis of financial market developments; (2) forecasts of aggregate banking sector profitability and solvency; and (3) summary assessment of the stability of the Finnish financial system (Figure 1).

Figure 1

Framework for financial stability analysis at the Bank of Finland



2.1 Regular surveillance and analysis

Ongoing surveillance and analysis of financial markets, which is a key element of a central bank's macroprudential tasks, provides a basis for the other tasks in the field. This analysis focuses on monitoring financial behaviour, institutions and market developments from the viewpoint of stability and efficiency. Due to the abundance of available information and the complexity involved in financial stability analysis, it is essential to identify key stability indicators, that is, macroprudential indicators (MPIs), that can be used to monitor the extent of systemic risks in the financial system and the likelihood of their realisation. It is especially important for the prevention of systemic crises to be able to identify and monitor factors that increase the vulnerability of the financial system to instability, as well as the mechanisms through which problems in one institution or market sector spread to other parts of the financial system. Past crises offer some clues for selecting these indicators, but the constant evolution of markets and institutions makes it unlikely that the next crises will be identical to those already experienced.

Under normal circumstances, regular surveillance and analysis takes up a significant amount of time and resources. For efficiency reasons, it is important to design a framework for surveillance that is robust, provides timely data and does not require a great deal of manual input.

At the Bank of Finland, regular macroprudential surveillance is broken down into the following four areas: (1) financing behaviour; (2) financial intermediation; (3) securities markets and exchanges; and (4) financial market infrastructure (payment systems and securities settlement systems). In addition to a detailed surveillance of domestic developments, regular surveillance also covers the EU/EEA and global (US and Japan) developments.

As part of the regular surveillance, the Bank prepares semiannual (spring and autumn) Financial Markets Reports. These are intended mainly for internal purposes, but the contents are such as to enable publication of the reports on the Bank's internet website.[4] As well as containing a few short articles on topical issues, each report contains a comprehensive statistical annex (see appendix for a list of figures and tables included). This statistical annex includes information on a number of macroprudential indicators for which public data are available.[5]

With regard to ***financing behaviour***, the emphasis is on identifying trends and changes in the lending and borrowing behaviour of the different sectors of the economy. This area also covers various

[4] At the moment the reports are available in Finnish only, but it is intended to start producing English versions in the near future.

[5] The contents of the report and the list of MPIs employed are constantly being developed. Confidential data, which have been obtained within the Bank or from the Financial Supervision Authority, are reported separately in internal reports.

financial fragility indicators for the economy, such as level of indebtedness, debt servicing costs of firms and households and the number of bankruptcies.

In the case of ***financial intermediation***, recent developments in profitability and solvency as well as in competitive conditions in the domestic and international banking sectors are analysed. In each report the most recent financial statement figures for all the major banking groups in Finland are summarised (year-end figures in the spring report and six-month figures in the autumn report). The autumn report also contains an overview of developments in the major foreign banking sectors, based on the annual results (for this purpose the Bank has subscribed to FitchIBCA's BankScope and augments this with its own surveillance regarding interim results for the largest banks). It also contains analyses of developments in the insurance sector and mutual fund business.

As regards ***securities markets and exchanges***, recent price developments in the stock and bond markets as well as the structural developments are reviewed. The phenomenal increase in market capitalisation and turnover of shares quoted on the Helsinki stock exchange has made it necessary to follow more closely the developments in the equity markets. Furthermore, due to the increasing pace of consolidation in both share trading (exchanges) and securities settlement, we also monitor international developments.

Financial market infrastructure covers both payment systems and securities settlement systems. From a systemic risk viewpoint, the smooth functioning of these systems has become increasingly important. With regard to the Bank's own RTGS system (BoF-RTGS), which today is a part of the EU area-wide TARGET system, a detailed and comprehensive surveillance system has been set up. A monthly internal report is produced covering a large number of transaction volume statistics (by sending/receiving institution, type of transaction etc) as well as information on banks' use of intraday credit. The overall TARGET volumes between countries in the EU area are also followed in the report and these are compared with the volumes in alternative cross-border payment systems. As regards securities settlement systems, regular surveillance covers developments in settlement volumes as well as the percentage of trades settled as scheduled.

In addition to monitoring and surveillance, more analytical work is clearly needed. Structural analyses, which help in forecasting the likely future developments in the financial sector, are an important part of macroprudential analysis. These analyses are carried out mainly by the economists in the Bank's Financial Markets Department. More time-consuming and ambitious research in this area is normally undertaken in the Bank's Research Department through a system of six-month secondment periods. From the financial stability viewpoint, the importance of structural analysis has increased significantly in recent years.

These analyses are published both in the Bank's Discussion Paper series and Working Paper series and occasionally through articles in the Bank's quarterly Bulletin. In particular, it is intended to publish separate annual reports on structural developments in the following three areas: the banking sector, securities markets and payment and settlement systems.

2.2 Banking sector forecast

An important tool used by the Bank of Finland in its macroprudential analysis is the regular forecast of the aggregate profitability and solvency of the Finnish banking sector. The origins of the banking sector forecast framework date back to the severe Finnish banking crisis in the early 1990s. In 1993, at the time when the Financial Supervision Authority (FSA) was transferred out of the Ministry of Finance and began to function as an independent authority, with an administrative link to the Bank, the FSA first adopted the so-called "Nordic Management Model" for bank-level forecasting. The model provided a quantitative framework for forecasting bank-level profitability and solvency. Soon, however, the forecast process was further elaborated by the Bank staff to focus more on the macroprudential aspects, that is, on aggregate banking sector developments.

Today, the banking sector forecast is produced semiannually, in close cooperation with the Bank's Economics Department and the Financial Supervision Authority. The forecast horizon is two years (the current year and the two following years). The banking sector forecast framework can be characterised as a "satellite model" of the Bank's macroeconomic model for the Finnish economy. There are two-way information flows between the banking sector forecast and the macro forecast. During the process, detailed discussions are held also with experts from the FSA, who provide the microprudential dimension to the analysis.

Additional information sources are banks' own budgets (analysed and summarised by the FSA), interviews and discussions with bank managers and the financial press. As the number of banking groups in the Finnish banking sector is relatively small, bankers regularly visit the Bank of Finland (typically four times a year) in order to present their interim results and discuss future developments. The information provided by the Finnish Bankers' Association is also taken into account. In particular, a quarterly survey conducted by the Association on the views of bank senior management, credit officers and bank branch managers about future loan and deposit demand and other matters is an additional information source that is used in the banking sector forecast. A regular survey, jointly undertaken by the Bank, the Ministry for Trade and Industry and the Confederation of Finnish Industries and covering the financing of small and medium-sized Finnish firms, is also taken into account in the process.

The forecast procedure is based on a simple spreadsheet system for the aggregate balance sheet of the banking sector.[6] The procedure starts with the collection of aggregate-realised balance sheet data from the previous year. Data on loan and deposit stocks and related interest rates are obtained from the Money and Banking statistics collected by the Bank as part of the statistics for the Eurosystem's monetary policy decision-making. The previous banking sector forecast is then compared with realised developments and forecast errors are carefully analysed. This is done in conjunction with the forecast error analysis of the macro model and constitutes the starting point for forecasts for the current and following two years.

Forecasts for loan developments are based on the exchange of information with the macro forecast, discussions with bank managers and the FSA staff. The forecasts for deposits are based on expected developments in monetary aggregates, which are obtained from the macro forecast. Forecasts for other balance sheet items are based on judgment and projections on possible institutional and structural changes. Certain residual items are finally determined by the balance sheet identity.

Once the balance sheet analysis is completed, the aggregate banking sector profit and loss account is analysed. An estimate for net interest income is determined on the basis of the balance sheet analysis and estimates of deposit and loan rates and market interest rates. Market interest rates are determined by the macro forecast. Estimates of banks' deposit and loan rates are made on the basis of structural developments, loan and deposit supply, demand shocks caused by institutional changes and general economic developments.

On the other hand, banks' non-interest income - which includes capital gains from securities and currency transactions, fees and commissions receivable, dividends and other income - is not as directly related to macroeconomic developments as is net interest income. Therefore, the forecast for non-interest income is more judgment-based and, in this analysis, discussions with FSA representatives play an important part. Background information is also collected from various other sources and the components of banks' non-interest income are discussed thoroughly during the forecasting process.

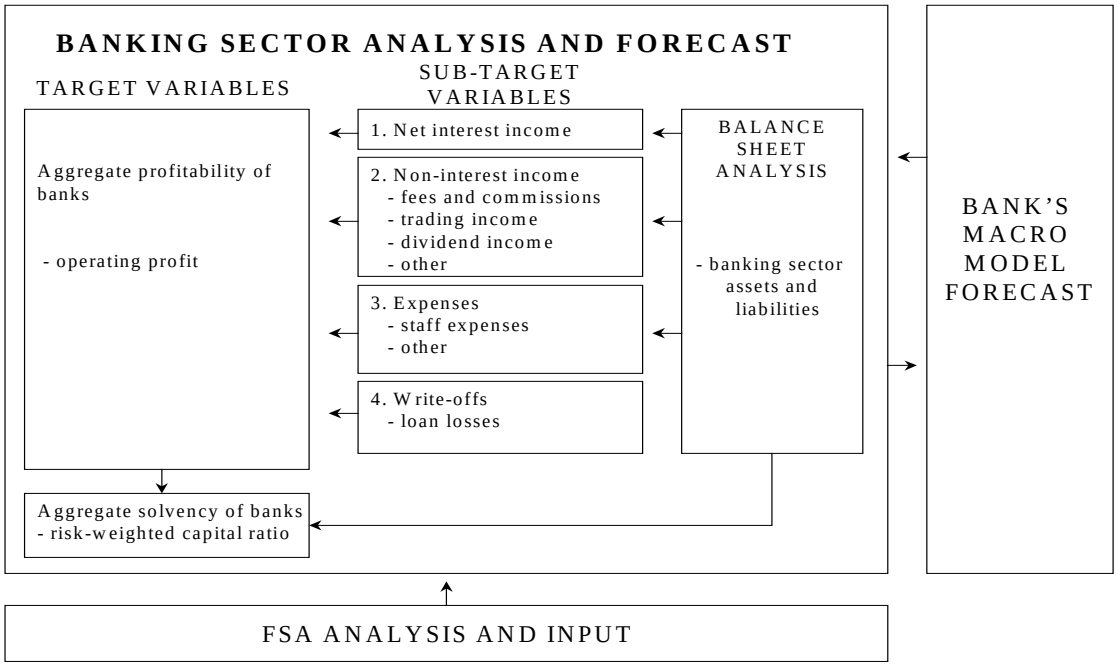
As regards expenses and depreciation, forecasts are partly based on banks' own estimates in their budget plans. The forecast for personnel expenses is based on estimates of the number of employees, structural changes in the sector and general wage developments. Other expenses are forecasted on the basis of the estimated number of branches, estimated depreciation and estimated investment needs of the whole sector. The forecasts for loan losses and non-performing loans are based on the FSA's supervisory information as well as analysis of other data, including data on corporate bankruptcies.

Figure 2 contains a diagram describing the banking sector forecast process. This illustrates the two-way information flows between the macro model and the banking sector forecast process, as well as the role of the FSA. As a result of the process, estimates for the aggregate profitability and solvency of the banking sector in Finland are obtained. In addition to profitability and solvency estimates, key forecast variables include estimates for asset quality, liquidity and efficiency.

[6] For a more detailed description of the Bank of Finland's banking sector forecast process, see Andersen, Hyytinen and Mörttinen (1999).

Figure 2

Bank of Finland's banking sector forecast process



Although the point estimates are of interest, more important are the ***sensitivity analyses*** made possible by the forecast framework.[7] The aim of these is to evaluate the stress level of the banking sector and to identify potential sources of wide deviations from the baseline forecast. Sensitivity analysis is partly scenario analysis and partly robustness testing.

Examples of sensitivity analyses are those involving variations in deposit or lending rates due to possible changes in factors such as competitive conditions, industry structure, or the yield curve. A single sensitivity analysis typically includes several scenarios aimed at evaluating the stress level of the banking sector.

Finally, an important aspect of the banking sector forecast framework is that it serves as a useful educational tool. By participating in the forecast process, it is relatively easy for junior staff to become acquainted with the working of the banking sector and its relationship with macroeconomic developments.

2.3 Financial stability assessment

Regular surveillance based on an extensive set of statistical data and the banking sector forecast form the basis of the ultimate goal of the Bank's macroprudential analysis - an assessment of the stability of the Finnish financial system. This assessment is prepared semiannually in connection with the other regular reports. The whole package - Financial Stability Assessment, Banking Sector Forecast and Financial Markets Report - is twice-yearly submitted for discussion to the Board of the Bank of Finland.

The financial stability assessment is qualitative and takes into account all of the quantitative information gathered through the surveillance and the banking sector forecast process, and the supervisory information obtained from the FSA. It covers all the main areas of the financial system, but the chief emphasis is on developments and potential threats in the banking sector. The main conclusions of the assessment are presented in an executive summary and the report also includes suggestions for policy measures to improve the stability and efficiency of the financial system. Any

[7] As regards past forecast performance, it seems that the forecasts for profitability have been conservative, whereas forecasts for solvency (the risk-weighted capital ratio) have generally been overestimated.

potential threats that are deemed to require action by the authorities are discussed with the management of the FSA and, if necessary, with officials in the Ministry of Finance (mainly matters requiring legislative changes).

The stability assessment report for internal purposes is strictly confidential and it is distributed only to the Bank's Board and senior management and to FSA senior management. A non-confidential version of the assessment is published semiannually (in June and December) in the Bank of Finland quarterly Bulletin, in the form of an article titled "Financial Stability in Finland".[8] The first such article was published in the autumn of 1998. The published assessment is more limited in coverage than the internal version because of the confidentiality of some of the issues. The main aim of the published report is to raise the awareness of financial market participants and the public at large about potential threats to the stability of the financial system.

3. Future challenges for the banking sector forecast

A major challenge for the current banking sector forecast procedure employed at the Bank of Finland is the pronounced restructuring that is reshaping banking sectors throughout Europe and around the world. During the last 10 years the Finnish banking sector has undergone significant changes. As a result of the restructuring process initiated by the banking crisis, the Finnish banking sector currently consists of three major banking groups and a handful of smaller banks. More importantly, cross-sector and cross-border consolidation in the financial sector has gained momentum in recent years in Finland. At the beginning of 2001, the first financial conglomerate will commence operations through the merger of the third largest Finnish bank (Leonia) and the largest Finnish insurance company (Sampo). The largest Finnish bank (Merita) has joined forces with major partners in Sweden (Nordbanken), Denmark (Unidanmark) and Norway (Christiania Bank og Kreditkasse) to create a major regional financial services group - Nordea - which comprises both banking and insurance activities in the Nordic countries. Methods have to be designed to capture the effects of non-bank activities and foreign activities on the domestic banking sector. More generally, the consolidation process poses formidable challenges for the analysis of systemic risk in the financial markets. Due to the consolidation process - both cross-sector and cross-border - it is becoming increasingly difficult to define "the Finnish banking sector". The present procedure should also be developed to take into account more systematically competitive changes in the sector.

The current forecast procedure is a mixture of quantitative and qualitative analysis (as opposed to a rigorous econometric model). Apart from the forecasts for key macroeconomic variables, which are obtained from the Bank's macro model, the forecasts for most banking sector-specific variables are based on judgment by the Bank's forecast team. It is currently envisaged that the banking sector forecast procedure will gradually become more closely connected with the Bank's macro model and that the quantitative aspects of the procedure will be systematically upgraded.

On a more limited scale, a few prominent candidates for more careful quantitative modelling within the current framework can be identified. First, the interest rate margin, that is, the difference between the average interest rate received on loans and the average interest rate paid on deposits, is a key item in bank profitability. Hence, it would be useful to quantitatively assess its responsiveness to changes in factors such as in market rates, competition and macroeconomic conditions. Alternatively, one could evaluate how sector-level interest rates (or spreads) on household and corporate loans respond to changes in overall market conditions.

Second, a more quantitative approach to estimating the amount of banks' loan losses would be desirable. In particular, it would be useful to be able to recognise whether a regime shift in bank lending has occurred, or is about to occur, toward excessively lax credit standards and deteriorating asset quality. Substantial loan losses, such as those realised at the start of the 1990s in Finland, are of paramount interest from the macroprudential viewpoint. One could, for example, employ models that have been used to forecast bankruptcies from macroeconomic data.[9] The estimated models could

[8] See the Bank of Finland website http://www.bof.fi/ for the most recent article.

[9] See Pesola (2000) for ongoing work in this area at the Bank of Finland.

then provide a basis for scenario analyses. Methods that are capable of detecting regime shifts and/or asymmetries in the data generating processes could also provide invaluable insights in this context.

However, it is well known that structural changes and breaks that alter market participants' behaviour represent a major challenge for the successful implementation of quantitative forecasting methods. On the basis of developments over the past two decades, such breaks seem to be an inherent feature of the banking sector.

Finally, it is important to increase the utilisation of the banking sector forecast framework in various sensitivity and scenario analyses. The current favourable macroeconomic development will unavoidably come to an end at some point in the future, and in estimating the ability of the banking system to withstand the adverse developments it is necessary to carry out stress tests. In particular, it would be very useful to incorporate more systematically developments in banks' non-interest income into the sensitivity analyses.

4. Cooperation between the Bank and the Financial Supervision Authority

In an attempt to strengthen the effectiveness of banking supervision in the midst of a severe banking crisis, the former Banking Supervision Office in 1993 was transferred out of the Ministry of Finance into a closer relationship with the Bank of Finland and was renamed the Financial Supervision Authority. In connection with this operation, some Bank staff members were transferred to the FSA. Some time after that, in 1995, the FSA was further strengthened by another transfer of Bank staff members. Moreover, there have been rather frequent shorter-term exchanges of staff between the Bank and the FSA.

There are several formal and informal channels for cooperation between the Bank and the FSA. The management groups of the Bank's Financial Markets Department and the FSA meet at least twice a year. The banking sector forecast process also pulls the staff from both institutions together twice a year in a systematic manner. In addition, there is active cooperation in the form of numerous informal meetings at the staff level. In the area of oversight of payment and settlement systems, cooperation between the Bank and the FSA is based on a mutually agreed Memorandum of Understanding.

For fruitful cooperation, smooth and timely exchange of all relevant information between the two bodies is essential. Other secrecy provisions notwithstanding, there are no legal constraints on the flow of information from the FSA to the Bank, provided that the information is necessary for carrying out the Bank's statutory tasks. Similarly, the Bank is obliged - secrecy provisions notwithstanding - to provide information to the FSA for supervisory purposes.

In addition to the department- and staff-level cooperation, a representative of the Bank of Finland acts as the FSA's chairman of the Board. Normally, this is the Bank Board member who is responsible for financial stability issues at the Bank. This arrangement further enhances the smooth flow of information between the FSA and the Bank of Finland.

Finally, a number of areas of analysis and research have been identified that would benefit from close cooperation between the staff of the Bank and of the FSA. The lists of issues for analysis and research by both institutions are regularly reviewed throughout the year to identify issues of common interest. The aim is to combine the practical supervisory experience of the FSA staff with the analytical skills of the Bank staff. Recent topics for cooperation include the risks in the interbank markets and channels for contagion, and an evaluation of banks' forex risk exposures.

In summary, the current arrangement via which the FSA is closely connected to the Bank has proved very fruitful for the macroprudential analysis carried out at the Bank of Finland. The cooperation is also welcomed by the FSA in that it provides the supervisory functions with background information about the economic and financial environment in which the supervised entities operate.

5. Concluding remarks

The severe banking crisis of the early 1990s is reflected in the framework for macroprudential analysis currently employed at the Bank of Finland. A specific tool that was developed for the needs of crisis management at that time - the banking sector forecast framework - has turned out to be useful in the regular financial stability analysis of the Bank. Recent developments in the financial sector pose challenges to the forecast process, but the same is true for the macroprudential analysis of central banks in general. Some avenues for enhancing the applicability of the banking sector forecast framework were identified in this paper.

The transfer of the Financial Supervision Authority to a closer relationship with the Bank of Finland in the midst of the banking crisis has proved to be fruitful for the conduct of macroprudential analysis at the Bank. As the very idea of macroprudential analysis is to combine both macro- and micro-level information to yield new insights into the extent of system-wide risks in the financial markets and their likelihood of realisation, the smooth flow of information between the prudential supervisory and the macroprudential functions is essential. It may be noted that the work which is currently being undertaken within the ESCB's Banking Supervision Committee (BSC) aims at exactly the same objective, that is, combining both the supervisory insight of national supervisory authorities and the macroeconomic insight of national central banks and the ECB to obtain a macroprudential view of the state of EU and euro area banking systems.

The importance of macroprudential analysis is growing because of accelerating evolution of structures in the European and international financial markets. The consolidation process profoundly affects financial fragility in the economy and systemic risks in the financial markets. These trends constitute both challenges and motivation for further development of the Bank of Finland's present macroprudential framework.

Appendix: List of figures and tables included in the Financial Markets Report of the Bank of Finland

Area	Figures/tables
Financing behaviour	• Financial assets in Finland, percentage breakdown • Household debt and debt servicing costs • Financial assets of households • Household debt stock by creditor and by use • Corporate debt stock by creditor • External finance for corporations, flow-of-funds • Corporate debt, stock and per cent of value added • Number of bankruptcies by industry • Number of bankruptcies and payments in arrears • Central government debt stock by instrument
Financial intermediation	• Exposures of industrialised countries' banks to emerging countries • Exposures of EMU area banks to emerging countries • Cost/income ratios of banks in selected countries in Europe and the United States • ROE of banks in selected countries in Europe and the United States • Breakdown of income of Finnish deposit banks • Profitability of Finnish deposit banks • Solvency of Finnish deposit banks • ROE of Finnish deposit banks • Cost/income ratio of Finnish deposit banks • Credit stock to domestic public by creditor • New loans to corporations by industry • New loans to households by use • Average interest rate on new loans by domestic banks • Interest rate margin of domestic banks • Breakdown of assets of deposit banks • Deposit stock by interest rate linkage • Loan stock by interest rate linkage • Non-performing loans and credit losses of deposit banks • Market shares in deposits • Market shares in loans • Assets of mutual funds registered in Finland by type of fund • Assets of Finnish insurance companies • Investments by Finnish pension funds in central government debt
Securities markets and exchanges	• Stock market capitalisation as percentage of GDP in selected countries • Market capitalisation of shares quoted on HEX • Market capitalisation of quoted shares: euro area vs the United States vs Japan • Turnover of quoted shares: euro area vs the United States vs Japan • New issues of quoted shares: euro area vs the United States vs Japan • Stock indices: world, global industrial indices • Stock indices: euro area, United States, Japan • 10-year government bond yields: Finland, Germany, United States, Japan • International bond stock by issuer • International bond issuance by issuer, net • Financing from international markets, by instrument • Market capitalisation, HEX • Market capitalisation and foreign ownership, HEX

	• New equity issuance in HEX • Turnover of equity trades, HEX • HEX indices, general and by industry • Money market instruments, stock • Bonds issued in Finland, stock • New bond issues in Finland • Finnish government benchmark bonds, stock and trading volume • Trades settled in APK (Finnish Central Securities Depository), value and number • Percentage of trades settled on time
Payment and settlement systems	• Average size of payments processed in the EU payment systems • TARGET payment volumes within the European Union • TARGET payment volumes between Finland and other EU countries • Relative use of payment media in selected countries • Average size of BoF-RTGS payments by type • Average number of transactions in BoF-RTGS system • Average value of transactions in BoF-RTGS system

References

Andersen, A, A Hyytinen and L Mörttinen (1999): "The Bank of Finland's Banking Sector Forecast Procedure", Bank of Finland, *Financial Markets Department Working Paper* 10/99.

Bank of Finland: "Financial Stability in Finland", *Bank of Finland Bulletin*, regular article in No 2 and No 4 each year.

Koskenkylä, H (2000): "The Nordic Countries' Banking Crises and the Lessons Learned", Bank of Finland, *Financial Markets Department Working Paper* 6/00.

Koskenkylä, H and K Virolainen (1999): "Macroprudential Supervision of Financial Markets", *Bank of Finland Bulletin*, 73(3), pp 11-15.

Leinonen, H and R Pauli (1999): "Bank of Finland's Oversight of Payment and Settlement Systems", *Bank of Finland Bulletin*, 73(3), pp 16-20.

Nyberg, P and V Vihriälä (1994): "The Finnish Banking Crisis and its Handling (An Update of Developments Through 1993)", Bank of Finland, *Discussion Paper* 7/94.

Pesola, J (2000): "Macro Indicators for Banking Sector Stability in Finland", Bank of Finland, *Financial Markets Department Working Paper* 9/00.