



REPORT ON FINANCIAL STABILITY

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Introduction

This is the second occasion that the National Bank of Hungary is publishing its “*Report on Financial Stability*”. The purpose of this publication is to provide a comprehensive overview of the key issues directly or indirectly affecting the stability of the Hungarian financial system and to present the main developments and tendencies witnessed since the first *Report*.

The structure of this *Report* corresponds to that of the publication issued in August: the regular chapters, which cover changes in macroeconomic conditions, the development of individual sectors, the stability of the banking sector, and changes in the positions of non-bank financial intermediaries, will again be supplemented by studies on current issues involved in the stability of the financial intermediation sector.

The *Report* states that the Hungarian economy grew at a rapid rate, while the business cycle took a favourable turn in the external markets in the first half of 2000 (and, according to the available preliminary data, throughout the year). At the same time, the decline in inflation in Hungary fell short of earlier expectations. The financing requirement of the corporate sector increased slightly, while households’ propensity to save remained at the same level as in 1999, lower than in earlier years, with a lower-than-expected increase in real income. The changes in the income positions of these two sectors did not have any substantial impact on the risks borne by the sector of financial intermediation.

The fundamentally favourable macroeconomic path had a positive impact on the development of the Hungarian banking sector and helped to improve expectations concerning the future. The capital position of this sector continues to be stable and its portfolio, profitability and cost efficiency have improved, while its exposure to market risk has decreased in comparison to the past period. At the same time, non-bank financial intermediaries – which are not too stringently regulated in many respects and are less transparent – have continued to gain ground. This, however, was not accompanied by a significant increase in systemic risk. With respect to non-bank financial intermediaries, those enjoying the backing of banks grew particularly dynamically, which calls attention to the importance of a consolidated assessment of bank groups.

The first study published in this issue of the *Report* deals with stress testing the banking system, and relies on and enhances the methodology of the “*Financial Sector Assessment Program*” conducted by the International Monetary Fund and the World Bank in 2000. These tests are, for the time being, at a pilot stage and therefore their findings should be handled with caution. The analysis examines the ability of the sector to resist extreme market price movements and cope with a radical deterioration in the client portfolio. According to the analysis, the resistance of the banking system to market risk is high, but a shock-type increase in lending risk would result in a substantial loss of capital by some banks. The latter may constitute a risk factor even at the system level.

The second study analyses the current practice of the treatment of lending risks and discusses some of the deficiencies still found in the practices of the banks. The analysis was conducted based on the criteria set out in the recommendations for managing lending risk as developed by the Basle Committee for Banking Supervision: thus it covers all fields from the legal environment and regulations to control, and the operation of management information systems affecting the management of lending risk.

The third analysis addresses the issue of netting, pointing out that an improvement in the legal regulation of netting is also required in Hungary in order to provide the banks with another instrument to reduce their counterparty and settlement risks. Above and beyond this, Hungary's obligation to harmonise its laws with those of the European Union also entails the need to transform the legal environment. Reconciliation between the relevant authorities is already in well-progressed in respect of several areas of regulations on netting, and it is expected that the new rules may be introduced in the first half of 2001.

The fourth study discusses the types of electronic banking services, their legal regulation, supervision and the tendencies and potential risks of their development in Hungary.

I. General economic environment

The general economic environment¹

Global business cycle and international capital market factors

Since August of 2000, the global business cycle has turned in a less favourable direction. The most important development is that it has finally become clear: the exceptionally rapid growth seen in the United States over the last several years is now slowing down. At most, opinions differ merely as to the extent of this slowdown. Although our expectations concerning the 2001 growth rate of the United States have not decreased substantially over the past half year, growth in 2000 was considerably higher than expected – thus economic growth in 2001 is likely to show a more serious slowdown. At the same time, the chances of unfavourable scenarios increased. Most analysts agree that U.S. economic policy will likely be able to achieve the goal of enabling the slowdown in growth to occur without a drastic recession. But at the same time, the possibility of a “hard landing” accompanied by a recession cannot be ruled out, and this would have a serious impact on the entire world economy. In contrast, economic prospects in the European Union remain relatively favourable: according to most estimates, the EU countries will perform better on the whole in 2001 than the United States, in other words, the slowdown in Europe will be far less pronounced (see Table I.1 and Chart I.1).

Naturally, this will have a positive impact on the growth prospects of the economies in Central and Eastern Europe as well. Thus, in spite of slower global economic growth, GDP growth in the countries of the region will presumably decrease only to a minor extent. Although growth in the region’s largest economy, Poland, is slowing down, this is primarily due to relatively high real interest rates curbing domestic demand. At the same time, there are signs that the current account deficit, which has reached dangerous dimensions, can be brought under control. In 2000, the Czech Republic recovered from its prolonged recession. Although the budget and current account deficits increased, the overall picture improved. Emerging markets outside Europe – primarily the countries of South America and Southeast Asia – will have to expect deteriorating prospects due to the restrained performance of the U.S. economy and the probable continuation of stagnation in the Japanese economy, although a looser monetary policy on the part of Fed may weaken this impact.

¹ The data of this chapter were closed on January 26, 2001.

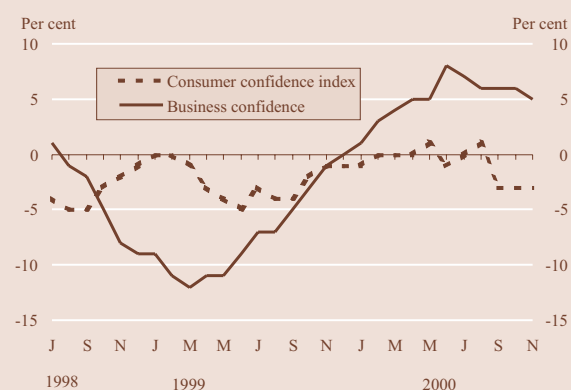
Table I.1 Real GDP growth rates in certain regions

	Per cent						
	1996	1997	1998	1999	2000*	2001**	2002**
United States	3.6	4.5	4.4	4.3	5.1	3.1	3.5
European Union	1.6	2.5	2.7	2.3	3.4	3.1	3.0
Central Eastern Europe	3.6	3.2	2.5	1.8	3.9	4.1	4.3
Asia and South America	6.5	5.1	2.6	3.9	4.3	3.5	3.7

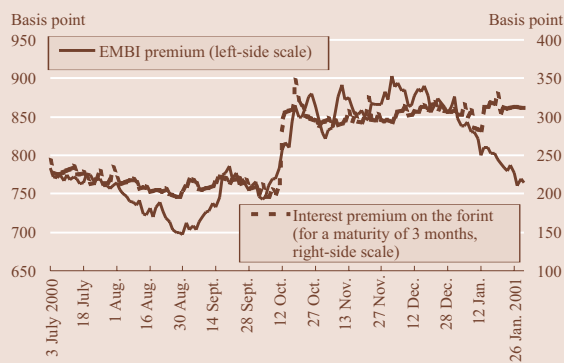
Source: Forecasts by international financial institutions and investment banks.

* Estimate.
** Forecast.

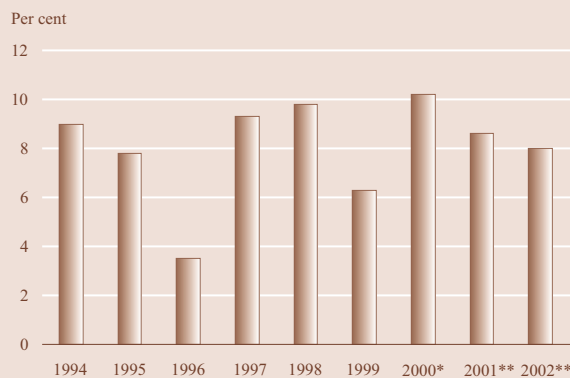
Chart I.1 Consumer and business confidence indices in the European Union



Source: European Central Bank.

Chart I.2 3-month interest premium on the forint and the EMBI bond index spread

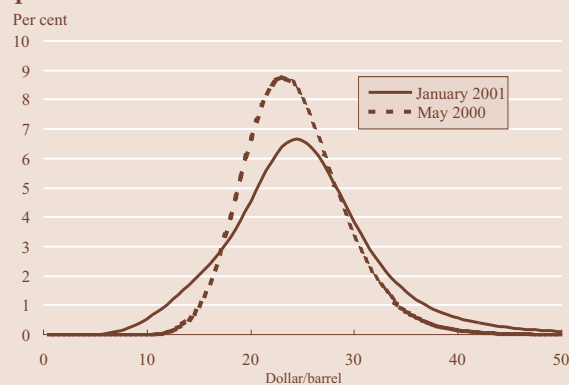
Source: JPMorgan..

Chart I.3 Volume of imports of the European Union

Source: European Commission, November 2000.

* Estimate.

** Projections.

Chart I.4 Risk-neutral probability distributions calculated from option prices with respect to the price of crude in six months

Source: NYMEX and NBH calculations.

Note: Under certain conditions, the above probability distribution may be regarded as the expectation of the market at a given point in time concerning the level of WTI (West Texas Intermediate) crude oil upon the expiry of the options. The probability distribution was estimated from option prices on May 5, 2000 and January 5, 2001.

Developments on international capital markets will mainly be determined by the turn in the U.S. business cycle and the mood of U.S. investors. Accordingly, the risk inclination of the global investment environment will decline relative to mid-2000. Consequently, international sovereign issuers will face a rise in the bond spreads over the U.S. government papers (see Chart I.2). Although the effects of the Fed rate cut early in January are far from unambiguous (it is not clear whether these should be regarded as final or transitory), the cut certainly brought relief on the international capital markets. Relative to the end of 2000, the EMBI spread decreased by 150 basis points. The premium on the forint did not follow this trend, remaining above 300 basis points since October.

Although there is very little likelihood of a shock similar in scale to the Russian crisis, the threat of financial crises in certain emerging market economies, particularly in some countries in South America and Southeast Asia, has increased somewhat relative to the first half of 2000. Should a financial crisis actually occur in those countries, it would most likely cause a substantial rise in bond spreads. The impact of EU growth prospects on Hungarian exports is uncertain for the time being (see Chart I.3). Although the expected decrease in GDP growth is small (not exceeding 0.3–0.5%), changes in GDP growth characteristically appear to be reinforced in changes in demand for imports. In contrast, the fact that consumption in the European Union is likely to rise at a higher rate is a favourable factor and, as the share of consumer goods in Hungarian exports is significant, demand for Hungarian goods will probably grow faster than EU imports. As far as the development of import demand is concerned, the result of these two effects is still uncertain. The strengthening of the euro relative to the dollar results in a deterioration of the competitiveness of Hungarian goods in markets outside Europe, but their weight in exports hardly exceeds 20 per cent. This means that as far as the business cycle in external markets is concerned, the overall picture is favourable: export opportunities will improve further, with a beneficial impact on the profitability of the corporate sector, and hence this development will also be advantageous from the viewpoint of financial stability.

From the perspective of the competitiveness of the Hungarian economy, the world market price of crude oil is an important external market factor. Most forecasts project that oil prices will decline over the medium term, resulting in an improvement in the terms of trade. It should, however, also be taken into account that the degree of uncertainty in expectations related to crude prices has also increased: early in 2001, the market is much less sure about future prices than it was half a year ago (see Chart I.4).

In assessing the impact of changes in international capital markets on Hungarian financial stability, it is necessary to distinguish three factors. Hungary's rating by foreign investors depends on the general mood on the international capital markets; the position of the Central East European region; and the relative rating of Hungarian investments within this region.

With respect to the latter two factors, Hungary is in a favourable position due to news which has positively influenced the external rating of the country, such as the EU Summit in Nice and the improvement in the rating of sovereign debt. The latter was enabled by the improved fiscal position of general government and the decline in government debt (see Table I.2).

At the Nice Summit, an agreement was reached on the institutional reforms to be implemented by the EU by end-2002, designed to enable more rapid admission of new candidates. The Heads of State and Government of the Union expressed their hopes that the best-prepared candidates could participate in the 2004 elections to the European Parliament.

At the same time, the deterioration in general international capital market conditions has also made its effects felt in Hungary, although not to such an extent as to imperil financial stability. Yet it is largely due to this deterioration that an increase in the interest premium on Hungarian government bonds was registered during the last half-year, while the gloomier mood on the international capital markets has left a clear mark on the prices in the Budapest Stock Exchange. In this respect, we cannot expect any substantial improvement in 2001. The capital market turbulences affecting emerging markets have had an impact on capital flows to Hungary, the exchange rate of the forint, domestic equity prices and on interest rates (even though to an increasingly lower extent), and the domestic financial intermediary sector will have to manage the concomitant risks.

Macroeconomic conditions in Hungary

Growth

The general upswing in the business cycle is closely related to the development of portfolio quality and the profitability of the banking sector. In 2000, Hungary experienced the highest growth rate since the beginning of the country's economic transition: over the first three quarters of the year, the real growth rate for GDP was 5.6%. Yet the course of growth over the year shows that this growth, accelerating since the second quarter of 1999, peaked early in 2000 and then quarterly GDP expansion gradually slackened off, following the changes in the business cycle in Western Europe.

While GDP was growing rapidly, the performance of individual sectors differed greatly (see Table I.3). While output in the manufacturing industry rose by 14.6% (based on added value), construction and services output grew at a much more modest rate and agricultural output decreased sharply from the middle of the year on. This may have the consequence that even in a generally favourable turn in the business cycle, there may be sectors in which recession weakens the debt service capacity of debtors and increases the lending risks faced by banks.

Inflation

As the absence of price stability makes an assessment of lending and market risks more difficult and economic calculations generally more uncertain, high and volatile inflation is one of the most important macroeconomic risks to the operation of the banking sector. Although the rate of inflation has declined spectacularly since the middle of 1995 and the annual consumer price index dropped into single-digit territory in the first half of 1999, the process of disinflation has been interrupted over the past one-and-a-half years. The primary reason for this is the vigorous rise in energy prices that began in the middle of 1999, which clearly fuelled inflation, in Hungary's trading partners as well.

Table I.2 History of Hungary's credit rating

	Japan Credit Rating Agency	Moody's	Standard & Poor's	Fitch-IBCA	Duff & Phelps	Thomson Bank-Watch
1987	A-	-	-	-	-	-
1988	A-	-	-	-	-	-
1989	A-	Baa2	-	-	-	-
1990	A-	Ba1	-	-	-	-
1991	BBB+	Ba1	-	-	-	-
1992	BBB+	Ba1	BB	-	-	-
1993	BBB	Ba1	BB+	-	-	-
1994	BBB	Ba1	BB	-	-	-
1995	BBB	Ba1	BB+	-	-	BB+
1996	BBB+	Baa3	BBB-	BBB-	BBB-	BBB-
1997	BBB+	Baa3	BBB-	BBB	BBB	BBB-
1998	BBB+	Baa2	BBB	BBB	BBB	BBB
1999	A-	Baa1	BBB	BBB+	BBB	BBB
2000	A-	A3	A-	A-	BBB+	BBB+

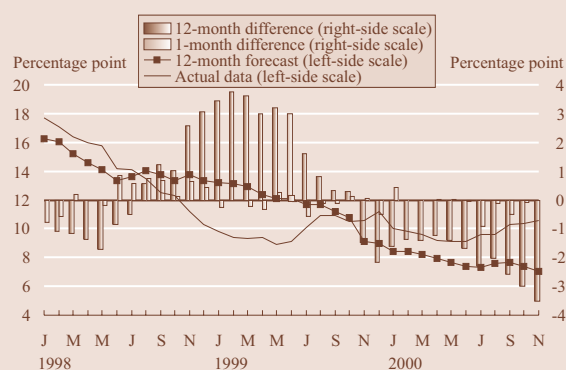
Table I.3 Gross added value/sector

(volume indexes, the same quarter of the preceding year =100)

	2000				Per cent
	Q1	Q2	Q3	Q1-Q3	
Agriculture	4.0	5.6	-7.9	-0.1	
Industry	14.8	12.2	11.3	12.7	
Of which:					
Manufacturing industry	17.1	14.1	12.7	14.6	
Construction	3.8	3.9	4.4	4.1	
Services	2.3	2.6	2.2	2.4	
Total, GDP	6.6	5.8	4.5	5.6	

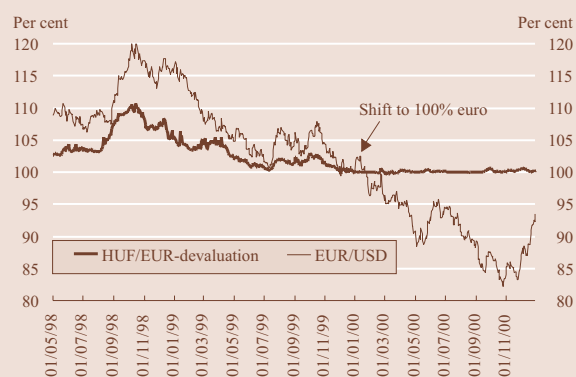
Source: CSO, preliminary data.

Figure I.5 Comparison of market inflation forecasts looking forward to 12 months and one month with actual inflation



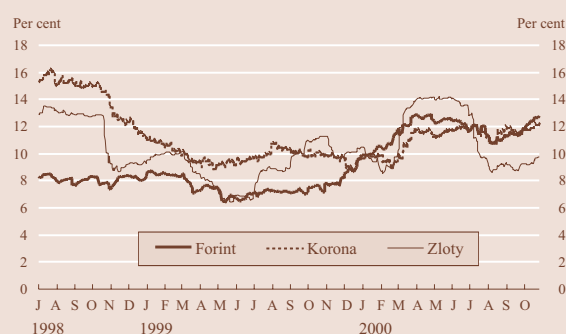
Source: Reuters and NBH.

Chart I.6 Euro-dollar exchange rate and changes in the exchange rate of the forint against the euro net of the devaluation announced in advance (January 1, 2000 = 100)



Source: Reuters and NBH.

Chart I.7 Annual volatility of the exchange rate of the forint, the crown and the zloty against the dollar (90-day moving window)*



* Annualised 90-day standard deviation of the logarithmic difference of the daily exchange rate.

This was then exacerbated by exogenous shocks, such as the change in the system of pharmaceutical price subsidies in 1999 and the rise in the price of unprocessed foods in 2000, whose direct impact on the general rise of the price level could not be pre-empted by shaping macro-level demand with economic policy instruments alone. As, however, the rate of devaluation was not increased in spite of the higher than expected inflation path, the forint's real exchange rate appreciated. Through this, and by raising the central bank's prime rate by one percentage point in the autumn of 2000, monetary policy aimed to minimise the indirect impact of the unfavourable shocks on inflation.

The dominance of unexpected shocks in the development of inflation is indicated by the increase in the error of inflation forecasts (see Chart I.5). The forecast looking one year forward showed a difference as great as in the forecasts prepared during the period under study early in 1999 (true, then in the other direction) relative to the rate of inflation actually measured, while even the forecast looking one month forward estimated the rise in the consumer price index half or one percentage point lower than the actual rate on several occasions. Although expectations more optimistic than the actual rates themselves impeded the rise in inflation, the errors in the forecasts indicate that the real interest rate expectations of borrowers and savers tended to deviate in the same direction from the real yields that actually developed at the end of the day.

Exchange rate developments

The extent of exchange rate exposure depends partly on the magnitude of open positions outstanding in the individual currencies and partly on the volatility of the forint's rate vis-à-vis the various currencies.

The prevailing exchange rate regime fundamentally restricts the volatility of the forint's exchange rate. The exchange rate may shift against the basket of currencies up to the margin of the $\pm 2.25\%$ band from the pre-announced rate of devaluation. As prior to 2000 the basket contained both dollar and euro (at a ratio of 30% to 70%), the changes in the dollar-euro cross rates partially appeared in the exchange rate of the forint against these two currencies. With the shift to the 100%-euro basket, not only does the central parity becomes independent of the dollar-euro rate, but the movement of the exchange rate within the band does not reflect it either (see Chart I.6). All this was accompanied by a further reduction in exchange rate volatility as far as the forint-euro rate was concerned, while the hectic changes in the dollar-euro cross rate made their full impact felt on the forint-dollar rate. Although the forint-dollar rate spread became 50% larger than that observed earlier in 2000, nevertheless, its magnitude still did not exceed the volatility of the Czech crown and the Polish zloty against the dollar, which move freely against the euro (and are thus much more volatile against this currency) (see Chart I.7).

The NBH has detailed data primarily on the open position of the banking sector,² and the central bank is authorised to regulate the banks' open positions. At the end of 1999 and early in 2000, the banks' position according to the balance sheet opened wide but a number of measures introduced or announced by the NBH

² See Chapter 2 for the detailed analysis of the open position of the banking sector. The analysis concerning the combined open position of the corporate and the household sectors can be found later in this Chapter.

(interest rate cut, introduction of the NBH bond, modifications to the mandatory reserve regime) eliminated the volume of open positions and the conversion demand for speculative purposes by March 2000. Of these, the modification in the mandatory reserve regime in force since July 2000 had the most direct impact on foreign exchange positions, as they levy additional costs on individual banks when their foreign exchange position in the balance sheet exceeds 30% of their warranting capital. The additional cost appears in the form of lower interest paid on the mandatory reserve placed with the central bank and is proportionate to exceeding the limit. A lower level in open positions and the reduction in the volatility of the exchange rate together mean that there is a lower level of exchange rate exposure in the banking sector.

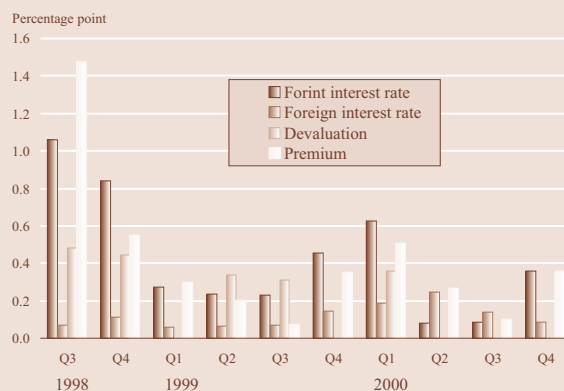
Interest rates developments

An important function of the banking sector is maturity transformation concomitant with undertaking interest risk as a business. Interest rate risk depends on the magnitude of balance sheet and off-balance sheet exposure to interest rate risk and the volatility of market rates. The Hungarian banking sector is characterised by the fact that the re-pricing period (duration) of assets is longer than that of liabilities and this has a negative impact on the profitability of the banks when interest rates rise. The 90-day cumulating re-pricing gap, which serves to measure the balance sheet interest rate risk exposure, indicates a decline in the banks' willingness to assume risk in 2000 (for a more detailed analysis, see Chapter II.2).

In comparison to countries with advanced financial intermediary systems, the possibility for reducing interest rate risk off-balance sheet is still rather limited in Hungary. Essentially the market of the forward interest rate products (BUBOR, discount treasury bill and 3-year bond products) of the Budapest Stock Exchange and the Budapest Commodity Exchange has not been operational. The interbank forward interest rate market is more significant, although it is still small in an international comparison. With the current exchange rate regime, changes in forint interest rates can be traced back to changes in devaluation, euro interest rates and the interest premium (see Chart I.8). As changes in the rate of devaluation are most of the time announced three months in advance, the unexpected changes in euro yields and the premium constitute the relevant market risk for the banks. In the second half of 1998 and early in 1999, the Russian and Brazilian crises increased the volatility in market yields primarily through the premium. Similarly, early in 2000, forint interest rates fell significantly owing to the change in the interest premium following the decrease in country-specific risk. In the third quarter of 2000, however, it was primarily the volatility of the euro yields which caused the fluctuation in domestic interest rates. In the latter case, the 100 basis point interest rate hike by the central bank and the subsequent increase in yields was only partially followed by the interest premium, as this step coincided with two quarter percentage point tightening by the ECB.

In addition to interest rate volatility, the magnitude of the real interest rate is also important for the stability of the banking sector. Too high a real interest rate increases the debt service on credits in real terms, reduces the net present value of projects and has a counter-productive impact on borrowers (owing to the

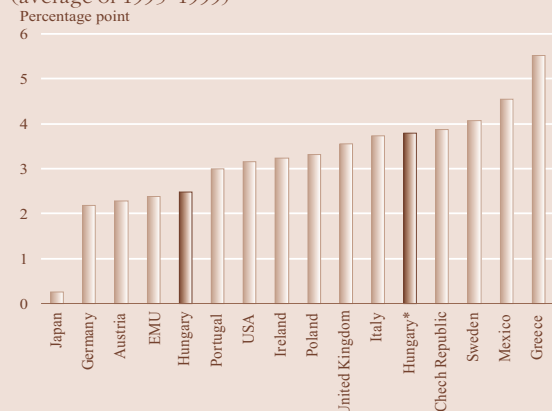
Chart I.8 Quarterly standard deviation of 3-month forint yields and their components



Note:
 Forint interest rate = yield on three-month government paper,
 foreign interest rate = three-month foreign yield of a composition and weights corresponding to the currency basket,
 devaluation = devaluation announced three months in advance, annualised,
 premium = the difference between the forint and foreign rates adjusted by the rate of devaluation.

Chart I.9 Short-term real interest rates

(average of 1995–1999)



Source: OECD

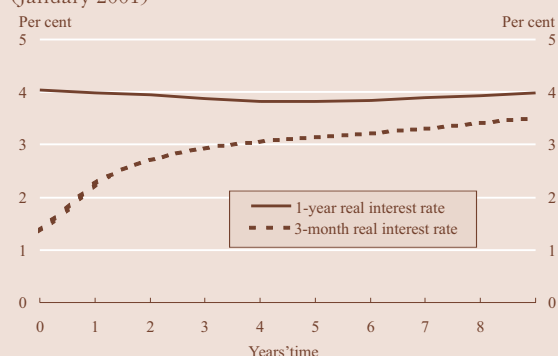
*Average of 1998–1999.

Chart I.10 Changes in the three-month real interest rate

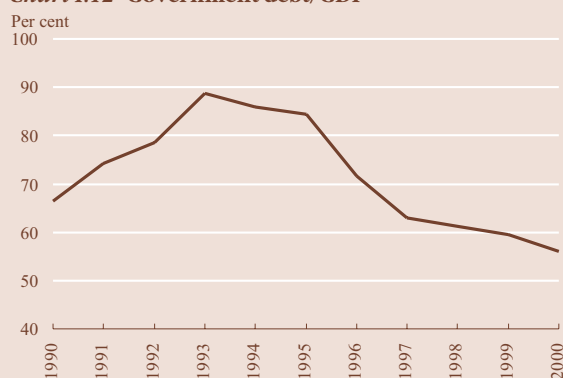
Note: the three-month government paper yield was deflated by the trend of core inflation calculated by the NBH.

Chart I.11 The 3-month and the 1-year real interest rate derived from the yield curve 10 years forward*

(January 2001)



Source: NBH: based on the zero coupon yield curve calculated by the NBH assuming that the 12-month inflation would drop from the 6% level early in 2002 to 3% by mid-2010.

Chart I.12 Government debt/GDP

higher interest rates, *ab ovo* only the borrowers having projects of higher expected value but also higher risk turn to the banks for credit). Ultimately, all this may give rise to an increase in qualified claims and deterioration of the profitability of the banking sector.

The main threat of a too low real interest rate lies in the decrease in financial savings and the evolution of a fund squeeze in the banking sector. Low investment lending rates frequently lead to the implementation of investment projects that would not appear as profitable under ordinary circumstances. In such cases, the low profitability of the implemented capacity and the default of the debtor arising from this take place only when real interest rates rise to the ordinary level.

In comparison with other OECD countries, the real yield on Hungarian short-term bills was not high in the second half of the 1990s (see Chart I.9). This holds in particular when the real interest rate level is compared to other countries demonstrating substantial disinflation (Italy, Sweden and Greece). Disregarding the 1995 fiscal adjustment and the years of the surprise inflation caused by it, the real rate level of 1998–1999 stood close to the average of the disinflating countries. This means that the abatement of inflation did not require the maintenance of high real interest rates in an international comparison. This is attributable partly to the consistent but gradual disinflation strategy and partly to the credibility of the crawling peg regime.

At the end of 1999 and early in 2000, the rapid decrease in nominal interest rates in parallel with the expected premium resulted in a rapid fall in real yields (see Chart I.10). The real interest rate reducing impact of domestic inflation, which rose unexpectedly owing to the rise in international energy and food prices, added to this from the summer of 2000.

The decline in real interest rates, however, had only a minimal contribution to higher inflation, because an easing in monetary conditions was impeded by the simultaneous appreciation in the real exchange rate. At the same time, low real interest rates may have contributed to the no more than 4% increase of the volume of households' forint deposits in the banking sector over the first three quarters of 2000, which rendered the financing of the dynamic corporate and household demand for credit more difficult from the liability side. With all this, the petering out of the supply-side shocks (food, energy) and the strengthening of the euro against the dollar from October went hand in hand with a decline in the short-based trend in core inflation and a rise in real interest rates, which we expect to continue also in the coming period.

In making investment decisions, what is important is not the short-term prompt real interest rate but that asserted through the full time horizon of an investment project (see Chart I.11). A stable value of around 4% is obtained for the annual real interest rate derived from the January 2001 yield curve for the full 9-year time horizon, while in the case of the 3-month real interest rate, a continuous rise may be expected from the current level of 1.5% to 3–3.5%. While the short-term real interest rate shows considerable fluctuations, real yields belonging to longer maturities evolve in a stable manner even over a longer time span.

Government debt

Primarily as a result of rapid economic growth, in 2000 the share of central government debt declined to 56% of GDP, down from 60% in 1999 (see Chart I.2).

In respect of the development of the structure of government debt, the tendencies observed earlier continued. Relative to preceding years, the share of debt denominated in foreign exchange declined further: by the end of 2000, 35% of the total debt consisted of foreign exchange debt, corresponding to 20% of GDP (see Chart I.13 and I.14). While in 1999 the State Debt Management Agency financed its maturing foreign exchange debt exclusively by new foreign exchange issues, in 2000, the substantial capital inflow made it possible to renew a part of the maturing foreign exchange debt with HUF-denominated funds. As a result not only the share but also the nominal value (expressed both in euro and HUF terms) of foreign exchange debt declined relative to the preceding year.

In 2001, 9% of the total foreign exchange debt of the central government will mature (amounting to EUR 850 million) (see Chart I.15). Some EUR 650 million must be paid in interest on foreign exchange debt. Thus, the financing requirement of the government's foreign exchange debt amounts to EUR 1.5 billion. This means that a 1% shift in the HUF-euro cross rate would alter the HUF value of the foreign exchange expenditure on interest by HUF 1.8 billion, and the HUF value of foreign exchange repayments by HUF 2.2 billion. More than 64% of HUF-denominated debt consists of bonds and discount treasury bills sold on the market, 18% consists of private placements of government bonds, 11% consists of securities issued to households, and slightly more than 6% consists of credit. Since last year, the share of government securities (bonds and discount treasury bills) originally issued through auctions in the primary market increased by more than 4 percentage points. The share of credits and bonds originally issued through private placements decreased by 2 percentage points each.

Government bonds play the most important role in financing maturing debt and the budget deficit. Government bonds accounted for more than 90% of net domestic issues, making up over 3.3% of GDP. (The remainder consisted of securities issued to households – while the stock of discount treasury bills remained practically unchanged.) The dynamic growth in fixed-income government bonds was accompanied by a spectacular increase in duration. The duration of fixed-income bonds increased from 1.95 years at the end of 1999 to 2.32 years. The State Debt Management Agency began to auction its second 10-year bond in August 2000. The increase in the weight of bonds within total debt and the longer duration reduces the share of debt to be renewed within a year. Some 41% of the debt outstanding at the end of 2000 will mature within a year: this ratio was 3 percentage points higher one year ago.

Positions of the sectors

The corporate sector

Risks to the financial system stemming from the corporate sector are, first and foremost, lending risks. Other sources of risk also become visible through the filter of the income generating capability of companies transformed into lending risk. Hence, when analysing the corporate sector from the viewpoint of financial stability, emphasis is placed on the analysis of the individual risk factors influencing profitability.

Chart I.13 Composition of central government debt as a percentage of GDP

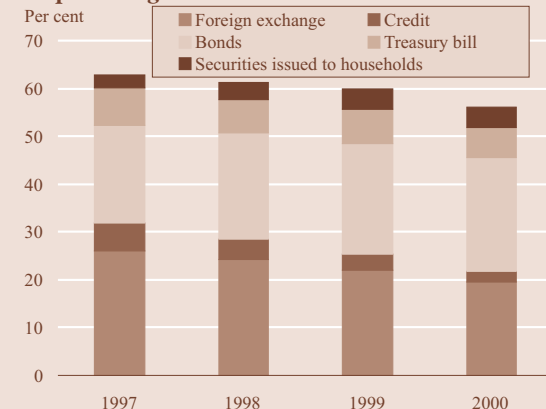


Chart I.14 Maturity structure of government debt denominated in HUF

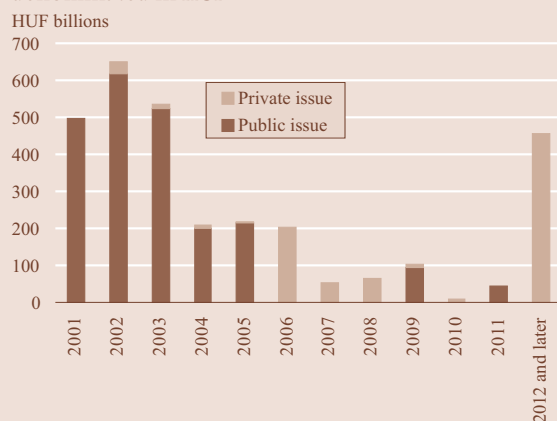


Chart I.15 Maturity structure of foreign exchange government debt

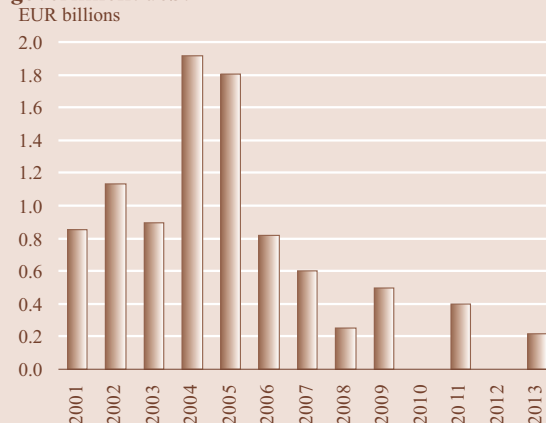


Chart I.16 Changes in the duration of fixed-income government securities

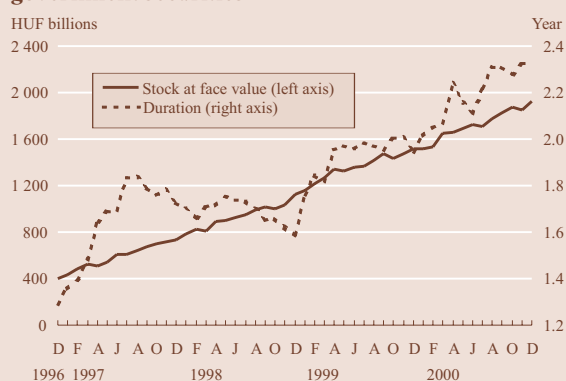


Chart I.17 Capital formation and borrowing of external funds by the corporate sector as a percentage of GDP

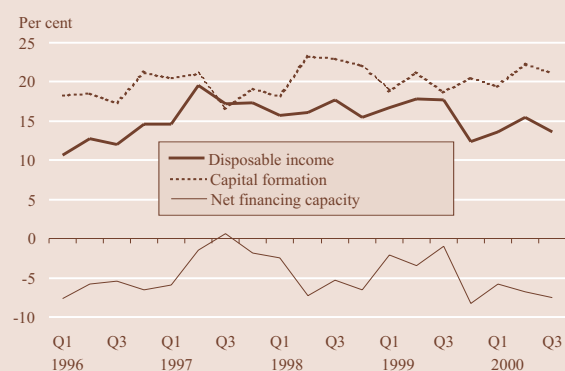
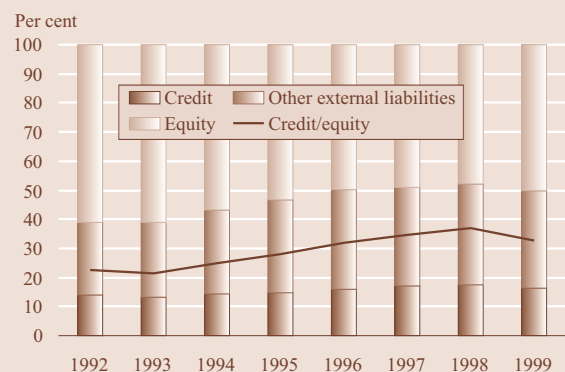
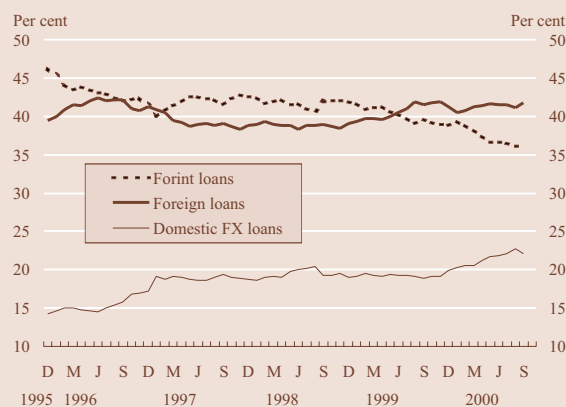


Chart I.18 Liability structure of non-financial undertakings as a percentage of the balance sheet total



Note: Changes in the distribution of equity and external liabilities in the corporate sector can be monitored until 1999 with the help of the annual State Financial and Audit Office statistics.

Chart I.19 Foreign exchange structure of corporate credits net of intercompany loans (gross)



The profitability of firms depends on real economic conditions and changes in the regulatory environment affecting the entire corporate sector or individual sectors differently. The leverage and the existing financing structure also have a considerable impact on the volatility of profitability in the corporate sector.

Income prospects, financing requirement

Following the shock in 1999 Q4, over the first three quarters of 2000 companies' disposable income expressed in terms of GDP remained at a lower level. In parallel, the sector's capital formation and investment activity remained constant. Together these factors resulted in an increase in the sector's financing requirement (see Chart I.17).

The decrease in the companies' disposable income in proportion to GDP is attributable partly to the deterioration in the terms of trade, and partly to the decreasing share of income reinvested by foreign-owned companies and, in general, to an increase in the portion applied to dividend payment and to a more stringent fiscal policy.³ By international standards, the ratio of income repatriation by foreign-owned companies can still be described as low, thus its gradual rise may be expected. On the whole, however, we do not expect any further decline in corporate disposable income expressed in terms of GDP. Fiscal policy is likely to be less restrictive, and the change in the terms of trade is also likely to be either favourable or neutral.

Changes in corporate financing structure

The decrease in the share of equity within the balance sheet total came to a halt in 1999, leading to a decrease in the gearing ratio and the volatility of profitability arising from this (see Chart I.18). This phenomenon can be regarded as transitory: banks were more circumspect in lending following the autumn 1998 crisis. There is substantial scope for credit expansion, as we may expect convergence to the higher average gearing ratio measured in EU countries.

In light of the credit and economic growth rates, in 2000 the gearing ratio may somewhat exceed the figures for 1999, but will not show any drastic change in comparison to the 1999 financing structure. The growth in lending is in harmony with the increase in industrial output, sales and exports, and also with the accelerating growth in the economy. In the future, we may not expect any further acceleration in the economy. Its growth rate will probably adjust to changes in the EU business cycle, with more moderate growth in lending than currently observed.

Based on lending data (net of seasonal and other effects⁴), foreign exchange loans are playing an increasingly important role in the corporate sector's credit portfolio. The domestic compo-

³ Presumably, the stringent fiscal policy affects those sectors of the corporate sector the most, which are in services and produce for the domestic market, particularly the companies subject to regulated prices and those in state ownership.

⁴ In order to properly observe the financing decisions of businesses brought in the function of financial and real variables, changes in the credit portfolios will have to be netted of various effects. In the case of foreign exchange credits, the impact of devaluation relative to the currency basket and the cross rate effect arising from a foreign exchange structure different from the forint basket, while in the case of forint liabilities, the impact of the inflationary increment will have to be removed. Thus the time series presented in the following contain the values of the basic variables calculated on 1995 prices.

ment of the FX-denominated credits has increased substantially, but the increase in foreign external liabilities has also been significant (see Chart I.19). At the same time, in order to be able to correctly assess the exchange rate risk faced by companies, it is necessary to take into account changes in financial assets as well.

The share of net forint loans in the total net lending position declined slightly in the second half of 1999, stabilised by early 2000 and has remained constant since then⁵ (see Chart I.20). Thus, the full exchange rate risk of the corporate sector – disregarding composition effects – has not changed to any extent worthy of mention.⁶ While exchange rate risk in the aggregate position of the corporate sector remains unchanged, the combined risk of individual company positions may represent an increasingly significant danger.

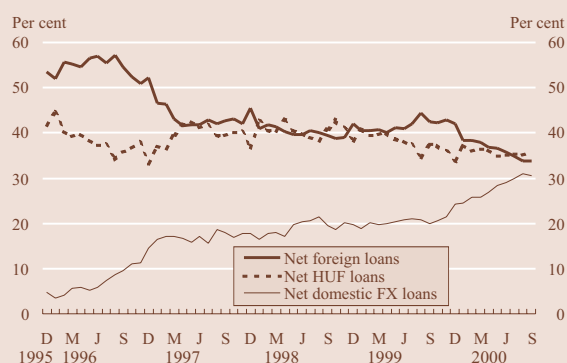
Since mid-1999, new corporate FX positions have been opened with the intermediation of the banking sector to a growing extent. To be more exact, companies preferred non-residents in respect of renewable or new FX assets, but residents in respect of their FX liabilities, presumably in accordance with the incentives offered by the banking sector (for more details, see Chapter II, Box text on corporate FX lending). From the viewpoint of financial stability, the (ownership) distribution of FX-denominated liabilities is not without significance, as, in this way, a greater portion of the exchange rate risk of the corporate sector and any eventual payment difficulties arising from such may be borne by the banking sector. The consequences on stability depend not only on changes in the total stock, but on a number of composition effects, the profitability of the companies involved in foreign exchange financing and their capability to manage exchange rate risk.

Unfortunately, the necessary data are not available for a detailed analysis of composition effects. There are a number of reasons that may explain the rapid growth in domestic foreign exchange credits:

1. If the rapid growth in FX loans can be attributed to spectacularly growing exports or if the growth in FX loans appears to be related to companies with natural coverage owing to their substantial exports, exchange rate risk does not increase even at the company level. In such cases, borrowing in foreign exchange reduces the open foreign exchange position, which is natural owing to the operating cash flows of the company or its net stock of commercial loans outstanding in foreign exchange. In our view, this explains the rapid growth in FX loans to a considerable extent. This is indicated, for instance, by the fact that the growth in the credit portfolio of the manufacturing industry rose in parallel with the increase in exports.

At the same time, FX loans taken out by companies in the category “*Financial activities and supplementary services, real estate transactions, services assisting economic activity*” increased at a rate exceeding even the growth rate of FX loans in the manufacturing industry. We have little informa-

Chart I.20 Foreign exchange structure of corporate loans net of intercompany loans
(distribution of net positions)



⁵ By net credit, we mean the balance of credits and financial assets (deposits) originating from the given segment. The change in the share of the net positions calculated in the individual categories is more sensitive or more accurate in forecasting exchange rate risks accumulating in the corporate sector than the individual gross aggregates or changes in total stocks.

⁶ Composition effects are analysed in the following paragraphs.

tion on the natural coverage of the companies belonging to this latter sphere of activity, but while the national product generated by them is only a fraction of the added value produced by the manufacturing industry, in the third quarter of 2000 their share in the net foreign exchange credit stock of the corporate sector was identical (31% each). Presumably, companies that had financed themselves with FX loans earlier characterised by excellent profitability and good coverage position may also be present directly or indirectly⁷ behind the loans categorised in the above sectoral group. As, however, access to domestic FX loans is granted to a wider circle of companies (hence of higher risk) than access to foreign loans, all in all, we presume that there is an increase in open positions and hence in exchange rate risk in the corporate sector.

2. Owing to the premium incorporated in HUF interest rates, it is cheaper (although of higher risk) to borrow in foreign exchange. With expectations of growing inflation and interests rates, demand for foreign exchange loans increases when the confidence in the exchange rate regime is firm. Essentially, FX lending growth because of this is based on utilising the hidden guarantee implied by the exchange rate regime, that is to say, a moral hazard obtains. The movement of the exchange rate within the band, however, represents a significant exchange rate risk (particularly in the case of short-term FX loans). According to the assessment of the central bank, this is not the primary explanation for the rapid growth in FX borrowing. In any case, the attraction of FX loans is expected to decline in the near future with the decline in the interest premium.

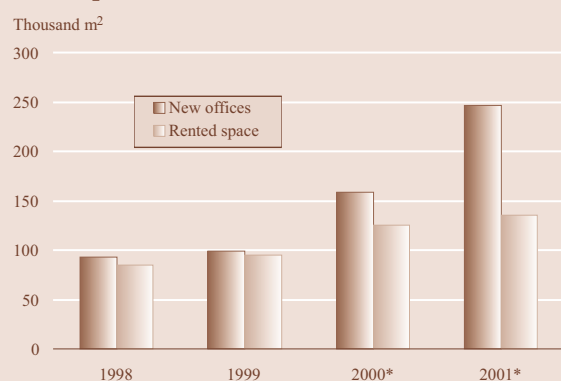
3. The increase in FX borrowing may also be an effect of factors independent of the corporate sector. The banks' HUF liabilities are rather constrained owing to the specific feature in the distribution of liabilities and the keen competition posed by non-bank financial intermediation, while changes in the regulatory environment have also prompted banks to increase their offer of foreign exchange credits (for more detail, see Chapter II). Since these reasons don't stem from the position of companies, the rapid rise in FX loans may imply an increase in open positions as well.

4. Expectations of exchange rate appreciation (not significant according to our current assessment).

The change in the composition of the foreign exchange basket on January 1, 2000 serving as the basis of setting the exchange rate can be followed by the distribution of FX loans approximating the earlier basket structure only with a time lag. Because of this, there is a transitory, fairly strong and continuously declining cross rate risk present in the credit portfolio concerned. Over the first three quarters of 2000, the HUF 50 billion growth in the stock due to the unfavourable change in cross rates accounted for about 20% of the total change in credit stocks.

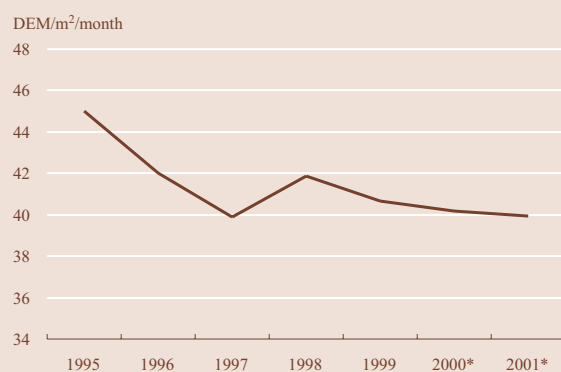
⁷ For instance, companies manufacturing for the export market having natural foreign exchange coverage may satisfy their demand for office space or other real estate needs related to production in the expanding "commercial purpose property" market paying rents which are characteristically specified in terms of foreign exchange.

Chart I.21 New office space on the market and rented in Budapest



Source: DTZ Hungary
*Forecast.

Chart I.22 Rents for first-class offices in Budapest



Source: DTZ Hungary
*Forecast.

Commercial real estate

The most important risk factor for companies active on the commercial real estate market is a possible fall in prices. Property market price bubbles have played a key role in the development of many financial crises. The profitability positions of real estate developers may have a sharp impact on the banking sector, because they generally work with a high gearing ratio.

Market prices for office space stabilised in 1999. Nevertheless, even up to the present, the number of renovated, modern offices and the amount of office space available for rent has been increasing dynamically in Budapest (see Chart I.21 and I.22). As a result of investment projects in progress, substantial further expansion may be expected in 2001. Consequently, we can expect a temporary supply surplus, in excess of demand, and a fall in the rate of utilisation. With the expected growth path of the economy, however, this phenomenon is unlikely to last very long. No deterioration of the conditions for the entire sector can be perceived behind the fall in the rate of utilisation. What we are seeing is a *"flight to quality"*, i.e. a major portion of property not rented out is concentrated in the market of property developed early, offering less in terms of comfort and services. There is ample supply on the retail property market, which may lead to more intensive competition between service providers and developers. At the same time, a further segmentation of the market will also lead to a stabilisation of prices, as weaker and stronger market centres evolve with major price differences between them.

Industrial-purpose investments constitute the segment of the market where the most dynamic growth is expected in the future. New logistics parks and facilities serving light industry are being built as financial investments. Owing to the temporary abundance of supply (which is expected), we do not expect similar prosperity in the other segments.

The household sector

Income position

Over the past two years, real income growth in the household sector has stabilised at a lower level compared with 1998 and the end of 1997 (see Chart I.23). The reasons for this can partially be found in the interruption of the process of disinflation. Real income increased at a lower rate owing to higher than expected inflation, while household consumption in proportion to income declined only to a small extent: hence, with the accumulation ratio remaining essentially constant, financial savings declined (see Chart I.24).

The decrease in household savings may also reflect a more favourable assessment of income prospects. When households believe that the restrained pace in the growth of their real incomes is only a temporary phenomenon, by reducing savings they can achieve the level of consumption they regard as sustainable over the longer term. This mechanism would result in a higher level of savings should real income grow at a higher rate in the future. In addition to the possibility of a lasting economic boom and the endeavour to smooth out the path of consumption, presumably the impatience caused by postponed consumption may also be responsible for the savings ratio being lower for the second year in a row.

Chart I.23 Changes in the income of households

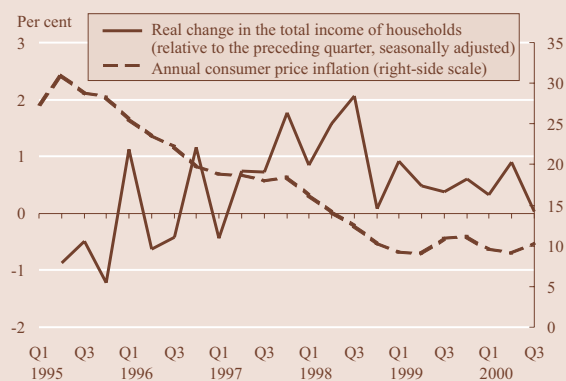
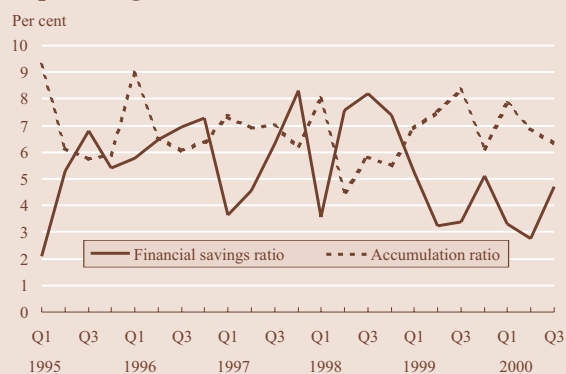


Chart I.24 Financial saving* and accumulation in percentage of income



* Financial savings and total income do not include compensation for inflation incorporated in interest rates.

Chart I.25 Annual change in the stock of financial assets and credits in real terms

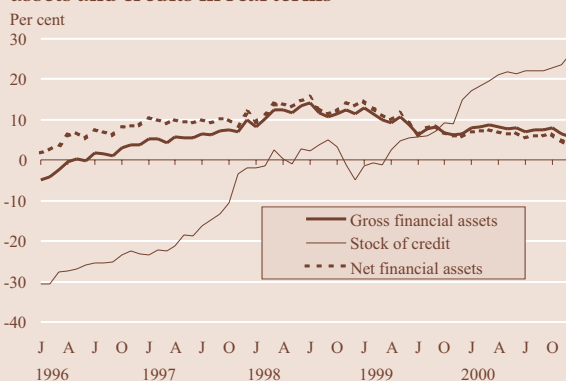
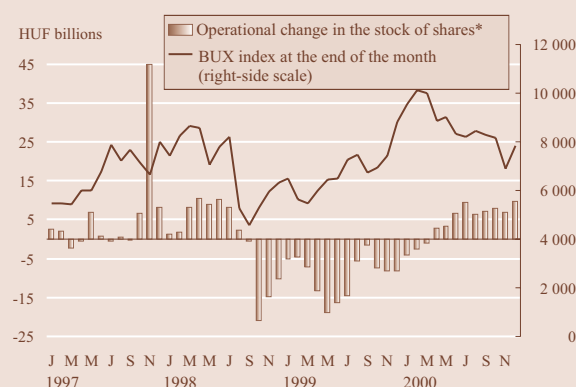


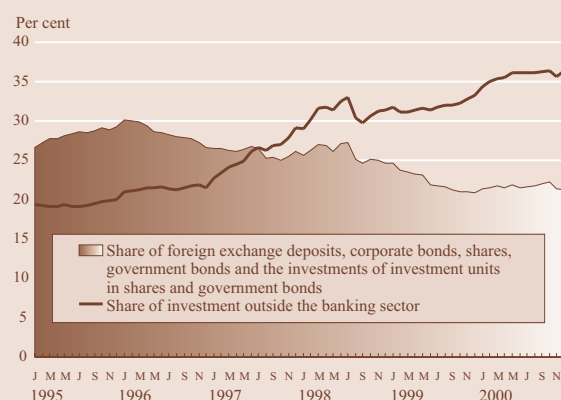
Chart I.26 Household share purchases and share prices

* The change in the value of the stock of shares is seasonally adjusted and does not include the revaluation originating from price movements and volume changes outside actual transactions.

Table I.4 Financial assets of the households in 2000

	HUF billions			
	Stock end of January 2000*	Stock end of December 2000	Change in stock	Of this transaction
Cash	669	799	129	129
Savings deposits and CDs	2,201	2,392	191	-12
Deposits in home saving funds	42	66	24	23
Bank securities	37	30	-6	-9
Small business deposits	122	153	32	20
FX deposits	663	745	82	30
Investment units	400	462	62	33
Government securities	753	815	63	2
Equities	254	299	45	60
Corporate bonds	4	4	0	0
Life insurance premium reserve	305	407	103	73
Claims against pension funds	264	403	140	111
Financial assets of households	5,712	6,575	863	460

* Owing to cash withdrawal prior to the Y2K date change and postponement of wage payments, end-December 1999 conditions are less suitable for comparison.

Chart I.27 Share of savings outside the banking sector and higher-risk assets within financial assets

Net financial assets

Over the past few years, consumption has been maintained primarily through strong growth in household borrowing. While the extent of savings in financial assets evolved in a more balanced way over time, borrowing reacted more sensitively to changes in income, future prospects and not least of all, the supply side. From 1999 Q1, real growth in borrowing has been positive but, owing to the stock of credit being lower than total financial assets, net assets still increased at a rate in excess of consumer price inflation. The last quarter of 2000 was the first time when quarterly growth in net assets – disregarding seasonal effects – essentially only offset the rise in consumer prices, i.e. its real value did not change, although relative to the level of the year before, it still showed real growth (see Chart I.25).

A further increase in borrowing can also be expected over the longer term, because the indebtedness of Hungarian households can be described as quite low in an international comparison. The credit portfolio of Hungarian households represents about 5% of annual GDP, while the same figure is typically above 50% in more advanced economies. At the same time, the difference is much less in terms of financial savings, thus it cannot be ruled out that borrowing will consistently grow faster than increases in financial assets. Assuming a constant corporate financing requirement, this can only be envisaged with a deterioration in the position vis-à-vis non-residents at a national economic level.

Financial assets

The share of forint deposits, which directly and significantly affects the capability of banks to acquire funds, declined further in the financial portfolios of households in 2000, although the placement of deposits was largely positive in the second half of the year, i.e. the stock of forint deposits increased to an extent greater than the compensation for inflation incorporated in interest rates. This, however, was unable to offset the decline seen in the first half of the year. During the same period, the placement of foreign exchange deposits was similarly positive and its extent surpassed that of the former. Share purchases by households were again significant in 2000, as the propensity to buy investment units and government papers was lower than in previous years. The wave of buying began when share prices reached their peak early in the year (see Chart I.26). Due to this, capital loss was substantial, hence the share of stock exchange shares in financial assets stagnated. Life insurance and payments to pension funds comprised a major part of savings, which cannot be described as liquid and which have been crucial for several years now (see Table I.4).

The switch into forms of savings outside banks continued in the early months of 2000, but came to a halt in the second half. As pension funds and life insurance have played an increasingly decisive role in the process of disintermediation over the past few years, this was not accompanied by an increase in risk in the portfolio. Although the tendency observed earlier seems to have been broken for the time being, the share of higher-risk assets⁸ did not increase last year either (see Chart I.27).

⁸ Over the past four years, the foreign exchange deposit, the corporate bond, the stock exchange share and the government bond gave rise to the largest revaluation effects in the financial assets of the households. Accordingly, we grouped the assets listed and the portion of investment units corresponding to the shares and government bonds in the total assets of the funds as higher-risk assets.

Debt structure

The process of borrowing began with the rise in consumer loans (see Chart I.28). The share of such loans within total household debt increased continuously from early 1998 until mid-2000; in the past half year, however, construction and real estate loans have grown more spectacularly.

In addition to government subsidies, developments in the real estate market may also have played a role in the dynamic growth of borrowing for housing construction and purchase purposes, which, in the second half of the past year, approximated that of consumer loans. The nosedive in share prices in the wake of the 1998 Russian crisis resulted in the development of demand pressure on the residential real estate market, which had till then been characterised by an excess of supply over demand. For instance, the prices of housing estate flats in Budapest doubled between 1998 and December 1999 and increased further in the first half of 2000. This strong growth in prices may have prompted many households to build, which they may have planned earlier, for which the preferential rates offered by the housing program created a conducive environment. Thus, demand partly turned away from the market of used property, where a minor, but clear price decrease was observed in the second half of 2000. In parallel, the number of housing construction permits issued began to rise steeply reaching one-and-a-half times the value of previous years by the third quarter (see Chart I.29).

As mortgages are generally applied when awarding construction loans, the development of a property market price bubble could, in principle, constitute a risk. The possibility of such a risk developing is, however, limited, because due to the costs associated with selling property, banks tend to register the property used as collateral at well below the market value. Thus, an eventual fall in real estate prices, which have increased spectacularly over recent years, will presumably not entail the threat of a loss in value of mortgage rights and thereby claims becoming unrecoverable.

Although real estate loans offered at preferential rates have reduced the average household lending rate and, according to several surveys, expectations of inflation have increased over the past year, the real interest rate calculable from lending rates can still be described as exceedingly high. It is therefore understandable that a larger household credit portfolio also means a greater interest burden. The interest payment liability of households has not decreased relative to their disposable income since 1998, and in 2000, it rose from the previous figure of 1.3% to close to 1.5% (see Chart I.30). This is regarded as low in an international comparison: in more advanced economies, values between 5% and 10% can be described as typical.⁹

The position against non-residents

It follows from the Hungarian exchange rate regime that the development of the current account deficit and the structure of financing the deficit play a crucial role in assessing the sustainability of the exchange rate. The crises in Southeast Asia have shed light on the fact that the guarantee arising from fixing

⁹ Owing to differences in methodology, these figures can be compared only in terms of orders of magnitude.

Chart I.28 Structure of the household credit portfolio

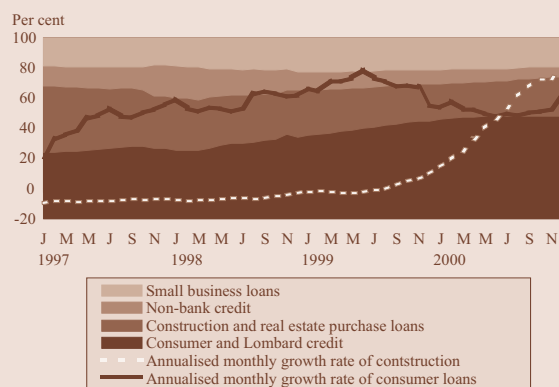
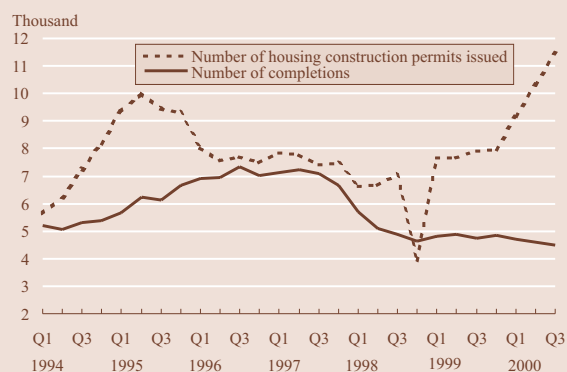


Chart I.29 Number of housing construction permits issued, number of completions



Source: CSO (seasonally adjusted)

Chart I.30 The magnitude of and burden on credit

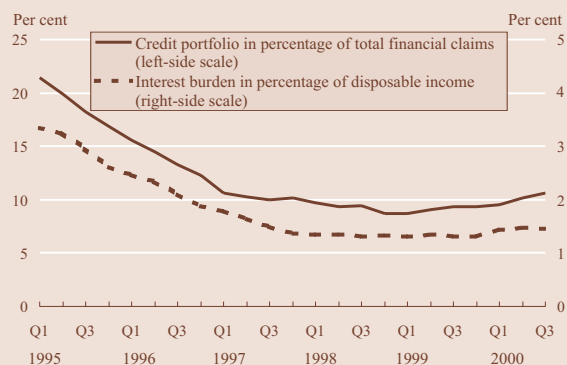


Chart I.31 Components of foreign exchange market intervention (cumulated values)

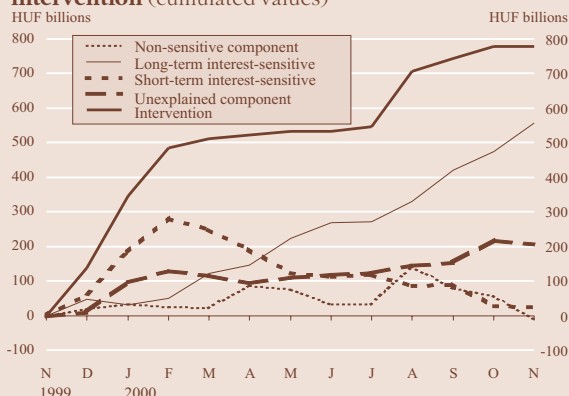


Chart I.32 Foreign debt in terms of GDP

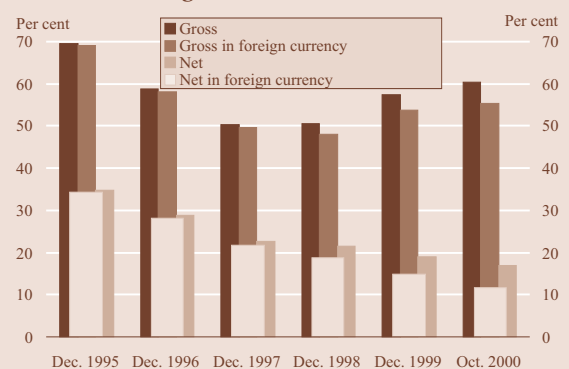


Chart I.33 Foreign liabilities maturing in less than a year as a percentage of Hungary's total foreign debt

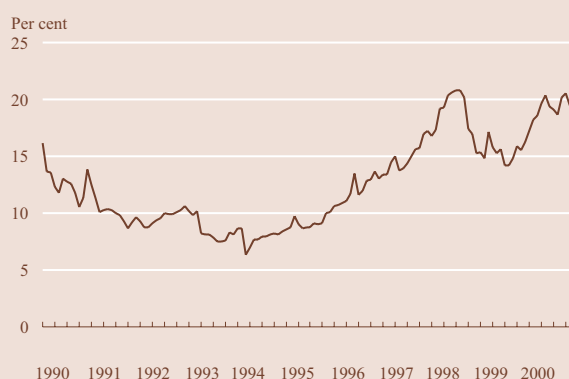
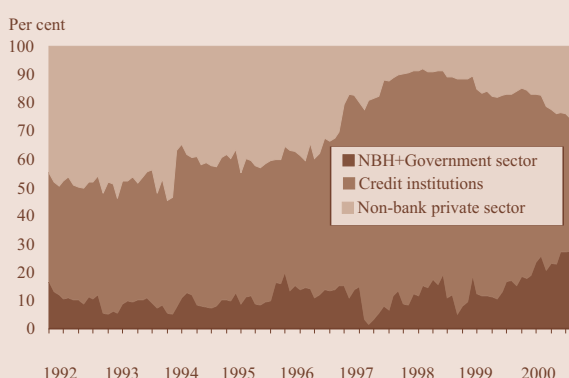


Chart I.34 Short-term foreign debt by sector



Note: In the graphs produced on the basis of the debt data of the current account, money market instruments and financial derivatives of portfolio investments and funds maturing in less than one year according to the original maturity of the other foreign debt belong to short-term debt. The long-term component refers to bonds and the other debts that mature over one year.

an exchange rate may lead to a situation, where economic agents and, in particular, the financial intermediary sector, underestimate the potential exchange rate risk. If the currency is devalued, this can disrupt the entire banking sector, thereby exacerbating the real economic costs of the exchange rate crisis. Assessing the sustainability of the exchange rate regime and monitoring the foreign exchange positions opened by banks and their clients is therefore indispensable for gaining a clear picture of the stability of the financial intermediary sector.

In addition to the size of the current account deficit, the composition of financing the deficit is also important. Inflows of foreign direct investment and portfolio investment can be regarded as the most stable items (together with the balance of the current account and capital account of the private sector, this is referred to as an "interest-insensitive" foreign exchange inflow). There can be major differences in interest-sensitive investments depending on how much they increase the vulnerability of the exchange rate regime. The possibility of speculation arises most strongly in the case of an increase in the stock of foreign government securities with a period to maturity of less than one year, and in the case of intervention owing to shifts in the open on-balance sheet foreign exchange position of the banking sector (*short-term interest-sensitive items*). Non-residents' purchases of government securities maturing in more than a year and direct corporate borrowing from abroad – although these can also be described as interest-sensitive capital inflows – are "less hot" by virtue of their nature and evolve in a more stable manner over time (*long-term interest-sensitive items*).

Over the past year or so, intervention was strong between December 1999 and February 2000 and in the months of August and September 2000 (see Chart I.31). During both of these periods, short-term interest-sensitive capital inflow was substantial; the stock itself, however, was largely reduced by the end of the period of speculation, as a result of the interest rate steps by the NBH and the changes in the regulation of the foreign exchange position; and accounted for less than 4% of the cumulated intervention by the end of the full period. Whilst the non-interest rate induced inflows (inflow of foreign direct investment, investment in shares) more than financed the deficit in the current and capital accounts of the private sector, the long-term interest-rate-sensitive capital inflow constituted a stable and calculable component of intervention. (Its stable growth, independent of the cycles seen in short-term interest-sensitive capital inflows, also substantiates that this component is independent of short-term interest and exchange rate expectations.)

In 2000, Hungary's gross foreign debt expressed in terms of GDP increased further, although this growth was less than that of the debt denominated in foreign currency owing to strong HUF government securities purchases by non-residents (see Chart I.32). Net foreign debt, however, decreased (in particular the FX-denominated component). The increase in the portion of foreign debt outstanding in forint terms is a favourable development because in lending to residents (primarily to the state) in forint terms, the foreign investor bears the exchange rate risk, thus the potential loss on devaluation does not burden the Hungarian debtor.

The maturity structure of foreign debt has recently shown a return to the trend observed prior to the Russian crisis (see Chart

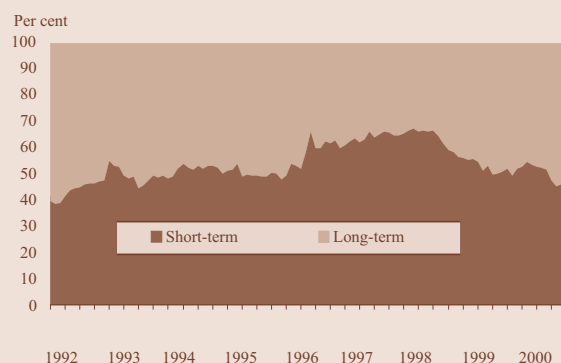
I.33). The share of short-term debt (maturing within one year) has grown gradually, broken only in the year following the September 1998 Russian crisis. The prevailing 20% ratio may, however, still be described as low by international comparison.

Within short-term foreign debt, the share of the banking sector has been declining since the 1998 Russian crisis, while that of the corporate sector and the state has been increasing (see Charts I.34 and I.35). This process was facilitated by the announcement of the NBH in March 2000 that the mandatory reserve system would be extended to include banks' short-term foreign liabilities. Following this, banks' foreign debts maturing in less than one year dropped in total by close to 20% (more than half a billion euro).

Changes in economic fundamentals cannot always foretell of an attack on the exchange rate for speculative purposes. An appropriate level of foreign exchange reserves can also play an outstanding role in preventing such attacks and in safeguarding the credibility of the exchange rate regime. The current level of foreign exchange reserves can be described as secure in comparison to economies of similar risk. The level compared to the size of the economy (close to a quarter of GDP) can be regarded as high, while the ratio of close to 40% projected to imports is close to the average of the countries under review (see Chart I.36).

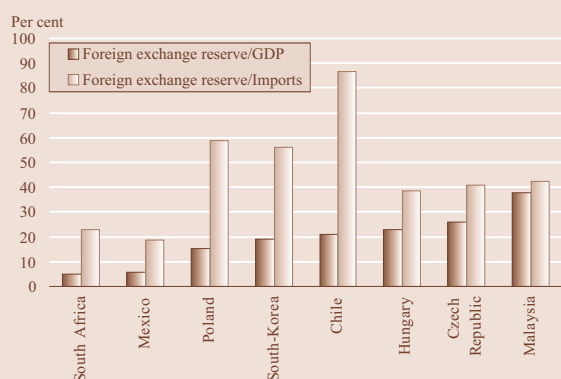
In addition to the traditional indicators of the appropriate level of foreign exchange reserves, it is worthwhile to examine the ratio of reserves to liquid monetary aggregates and short-term sterilisation instruments as well (see Chart I.37). In the event of speculation against the forint, these reserves (or a portion of this) may finance the purchase of foreign currency over the short term. While the ratio of foreign exchange reserves to M1 and to the M1 monetary aggregate including corporate and household foreign exchange deposits has been rising for years, the ratio to the short-term sterilisation stock (total central bank deposits + NBH bond) decreased slightly in 2000.

Chart I.35 Structure of the foreign debt of Hungarian credit institutions by maturity



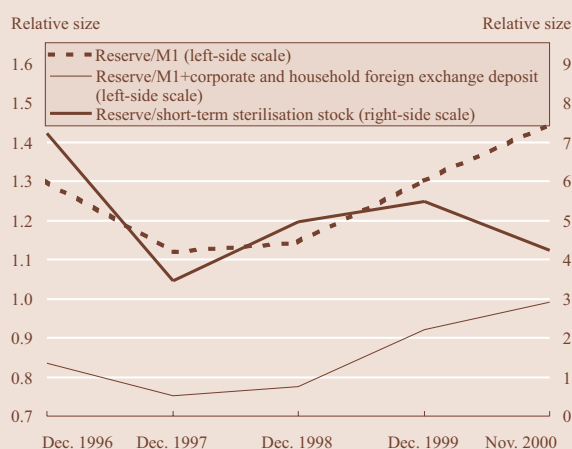
Note: In the graphs produced on the basis of the debt data of the current account, money market instruments and financial derivatives of portfolio investments and funds maturing in less than one year according to the original maturity of the other foreign debt belong to short-term debt. The long-term component refers to bonds and the other debts that mature over one year.

Chart I.36 Ratio of foreign exchange reserves to GDP and imports in certain emerging economies (June 2000)



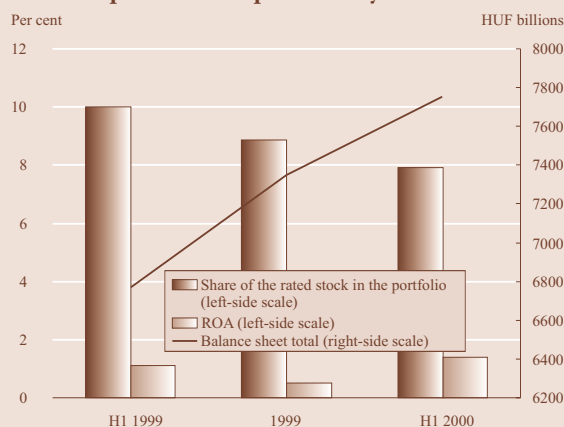
Note: IFS, Goldman-Sachs.

Chart I.37 Foreign exchange reserve indicators



II. The stability of the banking sector

Chart II.1 Changes in the balance sheet total, the rated portfolio and profitability



Over the first half of 2000, macroeconomic processes were characterised by a dynamic expansion in GDP and favourably evolving equilibrium indicators, which was reflected in the development of the Hungarian banking sector. The banking sector's balance sheet total rose by 5.5%, to HUF 7,754 billion in the first half of 2000. Banks' lending activity grew faster than GDP, and the credit/GDP ratio increased further, in line with the tendencies seen over the past few years, even though this ratio continues to be rather low by international standards. As far as the banks' financial results are concerned, favourable signs are beginning to appear: after-tax profits for the first half of 2000 (almost HUF 47 billion) are more than one-and-a-half times the figure for the same period of the previous year, and the process of capital loss in the banking sector in real terms seems to be coming to an end. With declining interest rates, banks' interest income and interest expenditure both fell. Nevertheless, this development was not accompanied by a decrease in the spread. The fact that the banking sector maintained a relatively wide cumulated 90-day negative forint re-pricing gap¹ (the stock of liabilities re-priced within the given period was greater than that of assets) certainly contributed to this. As a result of advances by non-bank financial intermediaries, a decline in the share of relatively cheap funds from households among the banks' liabilities² will have to be handled as a natural condition over the long term, which in itself has an unfavourable impact on the interest margin (it should be noted that some of these funds have been flowing to financial institutions in which banks have a stake, largely to investment funds). Simultaneously with the improvement in the banking sector's portfolio, cost efficiency also improved in the first half of 2000 – following a steady deterioration for the last several years. In addition to improved profitability at the sector level, several institutions that were previously loss-makers improved their financial results: thus the strong polarisation in the banking sector, which characterised 1999, lessened in the first half of 2000. According to all signs, the financial sector managed to weather the negative effects of the Russian financial crisis which hampered development for a while. A repetition of the major individual losses seen in 1999 is no longer expected (see Chart II.1).

For several years now, the banking sector has had a stable, high-quality foreign investor background, well equipped with capital. In addition to the general upswing in the business cycle,

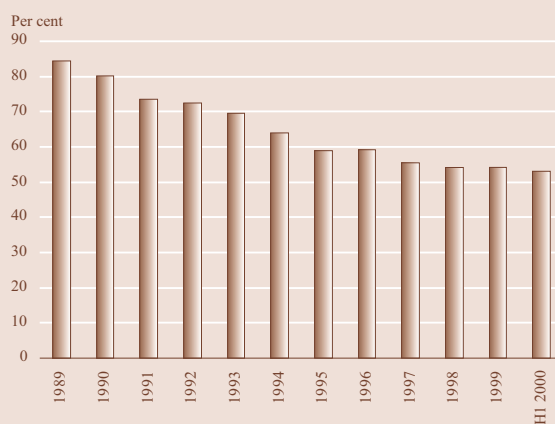
¹ In the second half of the year, the forint re-pricing gap became narrower, thus the negative impact of the turnaround in the interest rate trend was mitigated.

² The regrouping of household assets towards forms of savings outside the banking sector came to a halt in the second half of 2000.

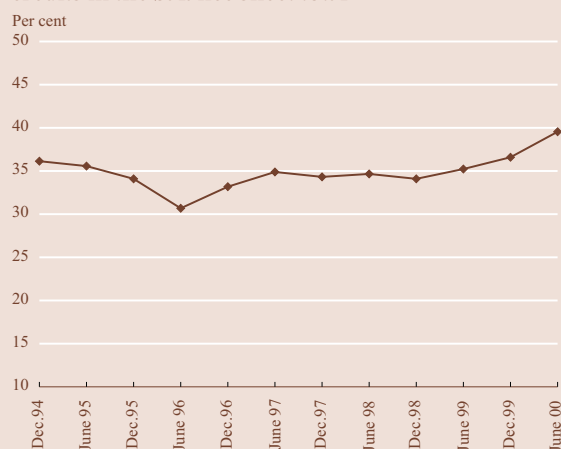
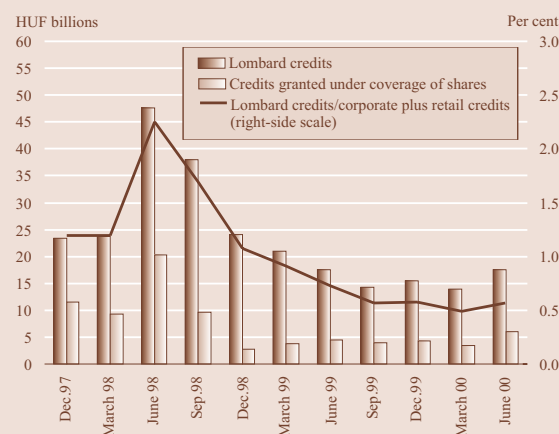
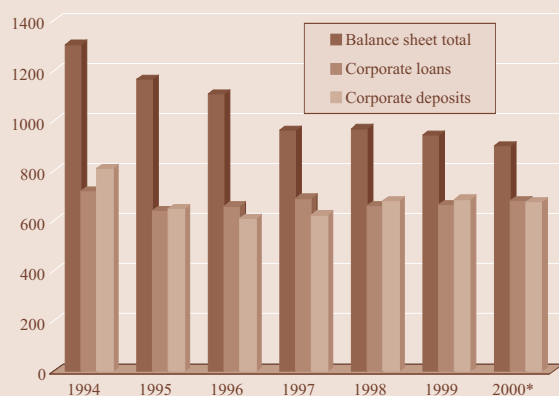
the operating environment of the banking sector has been characterised by increasingly keen competition among market participants and further advances by non-bank financial intermediaries. The decline in the degree of concentration in the banking sector seen over the past decade continued (the Herfindahl index calculated from the balance sheet totals declined from 942 points to 911 points in the first half of 2000). This reduction of concentration can still be attributed to re-organisation in the upper segment of the market: medium to larger-sized banks are profiting from the loss of ground suffered by the largest market participants (see Chart II.2). The process of deconcentration, underway for several years now, may soon come to an end with the mergers and privatisation schemes expected in the sector. In the first half of 2000, due primarily to the process of mergers and acquisitions among savings co-operatives, the unbroken decline in the number of credit institutions seen over the last three years continued. Fundamentally, these mergers are forced by regulations, as this is the only option for many savings co-operatives to meet the continuously rising, yet still exceedingly low minimum capital requirement stipulated by the Act on Credit Institutions.

The introduction of VIBER (Real-Time Gross Settlement System) in September 1999 reduced the operating risk of the banking sector. VIBER, run by the NBH, is a real-time gross settlement system that eliminates lending risk, as it performs only those orders for which there is coverage. At the same time, owing to real-time settlement, it enables the use of coverage several times within a day. There is some degree of liquidity risk even in this system, but it is not significant. First, well-tested algorithms are in place to find the agent responsible for the eventual development of a queue. Second, there is rather high liquidity in the payment accounts constituting the basis of the settlement procedure, owing to the high level of mandatory reserves, and the NBH provides a free intra-day credit line under coverage of securities. Third, liquidity risk can be reduced by adopting uniform rules of business administration. In parallel with the approximation of the level of mandatory reserves to that characteristic in the EU, more sophisticated methods will have to be applied in order to reduce liquidity risk. In contrast, the spread of electronic banking services increases operating risk. Through their electronic systems and products, banks may become targets of external and internal attacks. Confidential client data stored by the banks may fall into unauthorised hands, and there is a greater risk of virus infection. Definitive identification of the users of services and the confidentiality of the contents of electronic messages constitute particular problems. Banks are attempting to reduce these emerging operating risks by applying new, more sophisticated technical solutions and implementing security-enhancement measures. The use of Internet as a new channel of communication will expose banks to additional risks as for the time being the appropriate legal and regulatory framework is not in place for establishing liability in case of problems arising in relation to services provided through the Internet.³

Chart II.2 Shares of the five largest banks in the assets of the banking sector



³ The study "Electronic Banking Services in Hungary" addresses this subject in greater detail.

Chart II.3 Combined share of corporate and retail credits in the balance sheet total**Chart II.4 Lombard credits****Chart II.5 Corporate loans and deposits and the market concentration of the balance sheet total (Herfindahl-index)**

* At the end of H1 2000.

Changes in lending risks in the banking sector

The dynamic boom which began in the last four months of 1999 continued in the first half of 2000. The growth rate of the total stock of credit⁴ (13.2% in nominal terms) was nearly twice that measured in the same period of the preceding year (7.7%), while the combined share of the corporate and retail credit portfolio in the balance sheet total rose from 36.6% at the end of 1999 to 39.5% by the end of the first half of 2000 (see Chart II.3). During the first half of 2000, total domestic credits granted to the corporate sector increased by 14% (to HUF 2,723 billion), while lending to households was up by 16% (to HUF 342.5 billion). In the second half of the year, a continuation of the strong growth in client lending was observed. The recovery in client lending took place in a favourable macroeconomic environment, while the corporate sector's income position deteriorated slightly, and the growth rate of household real income dropped.

In the first half of 2000, the value of risk-weighted balance sheet items increased by 12%, i.e. more than twice the growth rate of the balance sheet total. Banks are now tending to turn away from risk-free government paper and central bank securities towards traditional corporate and retail lending – a process naturally associated with an increase in risks. This process deserves particular attention for risk management and prudential reasons, even though it is a natural result of the development of the economy and the banking sector. The volume of lending with securities as collateral is low, thus the risk that may arise from the possible development of a stock market price bubble is negligible at the level of the banking sector (see Chart II.4).

Corporate lending

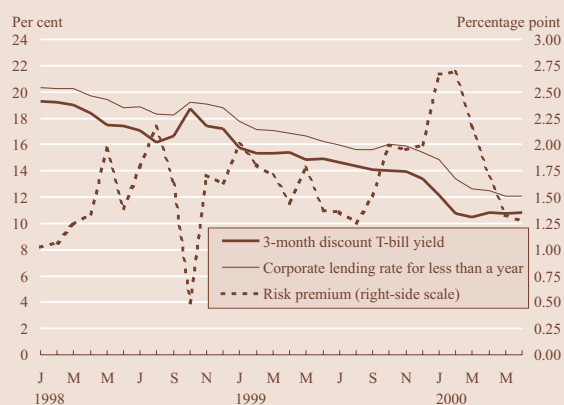
On the whole, banking activity in the corporate market has been characterised by low concentration for years, along with sharp competition (see Chart II.5). Nevertheless, half of the remarkable growth in the corporate credit portfolio over the first half of 2000 was the result of the increase in the stocks of four banks and three quarters of this growth the result of seven banks. One-third of the banks achieved above average growth rates. Credits extended to medium-sized, small and micro businesses showed practically no change within the total corporate credit portfolio, amounting to 30% at the end of the half-year, which means that the upswing in lending also affected this higher-risk segment of corporate sector. The total stock of corporate credits extended in forints rose by 9.4% in the second half of 1999 and by 7.4% in the first half of 2000. As the dynamic upswing in corporate forint lending was realised partly through a shift towards higher-risk customers within the existing clientele and partly by an expansion of the clientele, banks should, in principle, assert a growing risk premium in lending rates. Accordingly, the spread between risk-free market yields and lending rates increased substantially in September–October 1999, while the unusually large difference seen in the first two months of 2000 was due to the steep fall in risk-free market yields and the delayed adjustment in lending rates. As a

⁴ The credit portfolio incorporates loans extended to the central budget and other sectors as well as corporates and households.

result of the intensive competition in corporate lending, by the end of the half-year the spread fell back to a level close to that seen in August 1999 (see Chart II.6).

The growth in credits extended in terms of foreign exchange played a decisive role in the expansion of the corporate credit portfolio: their total exceeded the value for the beginning of the year by 26%, whereby the share of FX-denominated credits in the credit portfolio of the corporate sector rose to 38.4%, up from 34.7% at the end of 1999. Some 82% of the credits extended in foreign exchange were denominated in euro which, with the current composition of the basket, represents a lower exchange rate risk for banks, as there is no need to expect changes in cross rates. Previously, it was growth in foreign exchange credits maturing over one year that had been dominant. In contrast, in the first half of 2000, FX credits with maturities of less than one year increased at a faster rate. In segments where there is no natural coverage (companies' revenues are generated in terms other than foreign exchange) or exchange rate risk management techniques are underdeveloped, the dynamic expansion of the corporate FX credit portfolio increases lending risk arising from exchange rate risks assumed by companies, even though this risk can still be described as low by international standards.

Chart II.6 Spread between the corporate lending rate and the risk-free market yield

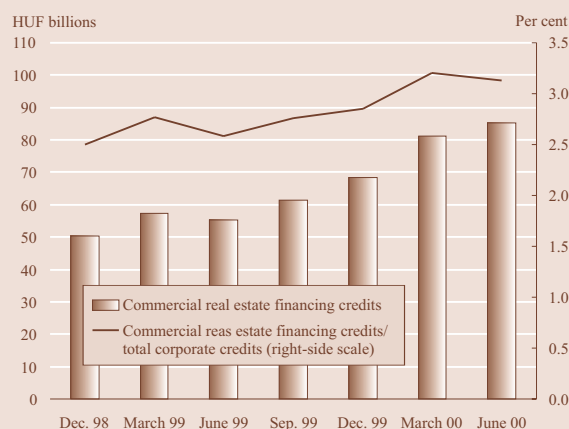


Corporate foreign exchange lending

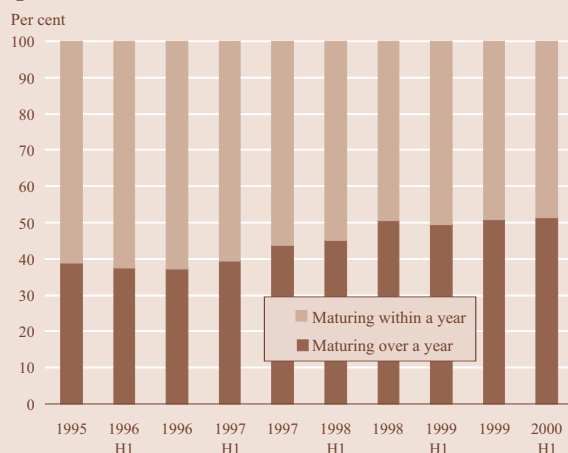
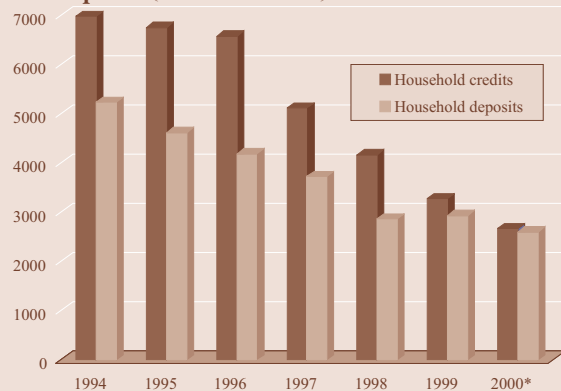
The gross foreign debt of the corporate sector grew faster than the stock of domestic foreign exchange credits – consequently, the high growth rate in the expansion of the domestic FX credit portfolio cannot be attributed to a decline in direct foreign borrowing. At the same time, as firms' foreign claims grew slightly faster than their debts vis-à-vis non-residents (excluding intercompany loans), the corporate sector's net debt vis-à-vis non-residents did not increase.

Supply factors and demand factors are both among the reasons behind the increase in foreign exchange lending. Banks' forint funds only increased at a rather restrained rate between January 1999 and June 2000: thus, the basis of the credit expansion has also been foreign exchange funds originating largely from abroad. To reduce the exchange rate risk in the balance sheet, banks also offered foreign exchange more and more on the asset side. (Owing to relatively low liquidity, the forward market is unable to satisfy the banks' transaction needs going in the same direction, thus the possibility of off-balance sheet hedging against exchange rate risk is rather limited.) The promised change in regulations on open positions may also have had an impact on the expansion of FX lending. This regulation entered into force from the second half of the year and made it more expensive to undertake an open on-balance sheet position in excess of 30% of the regulatory capital. Demand for foreign exchange credits was enhanced by favourable pricing and relative cheapness (with strong competition in the corporate market, rates on domestic foreign exchange credits are lower than the rates on foreign exchange credits extended by non-residents) even though banks tend to offer these credits primarily to large companies qualifying as the best debtors (multinational companies). In respect of export companies, another important motivating factor in borrowing in foreign exchange is the effort to reduce exchange rate risk.

As far as the sectoral distribution of domestic corporate FX credits is concerned, by far the greater part of the approximately HUF 400 billion growth in the total stock generated between end-1998 and the end of the first half of 2000 (HUF 158 billion) was borrowing by the sector "financial activities and supplementary services, real estate transactions, services assisting business activity". This indicates that the transformation of foreign exchange funds into forint credits was partially shifted from the banking sector to other financial service providers. (The growth in the stock of foreign exchange credits extended to financial enterprises – primarily leasing companies – also continued in the second half of 2000, partly due to the fact that the open position in the balance sheet was only rendered more expensive for credit institutions.) In this case, additional lending risk may originate from the exchange rate risk undertaken by financial enterprises. When foreign exchange funds are not transformed into forint credits (i.e. other financial service providers lend the foreign exchange credit taken out in terms of foreign exchange), the additional lending risk may arise from the exchange rate risk of the ultimate borrowers of the FX credit at the level of the banking sector (even though this occurs through several steps). When the ultimate borrowers are higher-risk clients than the direct borrowers, this may be a source of an additional indirect increase in lending risk. Exporter companies engaged in manufacturing and, primarily in machine manufacturing came in second in terms of their shares in the expansion of the credit portfolio (HUF 85 billion and HUF 57 billion, respectively). In their case, the operating cash flows of these companies provide a natural coverage for exchange rate risk. Trade and the repair of road vehicles and prime necessities also accounted for a substantial share (HUF 78 billion).

Chart II.7 Real estate development credits *

* Credits extended to construct and develop commercial real estate (office buildings, shopping centres, etc.)

Chart II.8 Maturity structure of the corporate credit portfolio**Chart II.9 Market concentration of household credits and deposits (Herfindahl-index)**

*At the end of H1 2000.

Following a nominal decline in investment credits in the first half of 1999, the expansion seen in the second half of that year continued on into the first half of 2000. With an 8% increase in total stock, investment credits amounting to HUF 77 billion were extended. The volume of credits financing the construction and development of commercial real estate increased substantially – their share, however, is still low, and thus the risk arising from the possible development of a real estate market price bubble is, for the time being, not significant at the level of the banking sector (see Chart II.7). The stock of credits extended to develop commercial real estate is concentrated at four large banks, but the combined share of such credits in the total corporate and retail credits of these four banks is no more than 6.2% – thus they do not constitute any substantial risk, even indirectly. The second half of the year saw more dynamic growth in investment credits and particularly loans financing the construction and development of commercial real estate.

From a financing viewpoint, banks tend to assess businesses in agriculture and food processing as carrying the highest risk, basically due to the chronic shortage of capital and technological obsolescence characterising the sector. There is also a considerable regulatory risk affecting this sector: the Act on Membership Shares in Agricultural Co-operatives (entering into force in 2001) requires the identification of holders of so-called “external membership shares” and the redemption of such shares, as a result of which the capital position of co-operatives will deteriorate further and liquidations may take place on a massive scale. Owing to the high risk inherent in financing agricultural and food processing enterprises, banks are now aiming at improving the security of the credits already extended (e.g. by requiring additional collateral) and at restraining their lending activities. Moreover, some banks have formulated strategies for withdrawing from the sector. The share of credits with a maturity of over one year in the corporate credit portfolio increased considerably in the course of 1997–1998. Since then, it seems to be stabilising: more than half of the corporate credit portfolio of the banking sector matures over one year (see Chart II.8).

Lending to households

The dynamic expansion in retail lending which commenced in 1998 continued in the first half of 2000, but the total can still be regarded as very low in an international comparison, indicating that this dynamic growth in retail lending will also be sustained over the longer term. More and more banks are targeting the retail market, as is visible in the boom in lending, in addition to relevant investments: in the first half of the year, more than two thirds of the banks experienced growth rates in lending to households which exceeded that of the expansion of their total credit portfolios. Concentration in the market of households deposits and credits has been declining year after year, even though it is still relatively high (see Chart II.9). The expansion in the household credit portfolio⁵ appeared primarily in the growth of credits ma-

⁵ The reason for the December jump in the household credit portfolio observed in earlier years is attributable to settlement technical reasons: to debiting the clients' account with the annual interest on construction credits at the end of the year. With the shift to more frequently debiting interest to the clients' accounts, the substantial increase in the credit portfolio at the end of the year could no longer be registered in 1998–1999.

turing over one year. In spite of high real rates, the stock of consumer loans and other credits increased vigorously (by 23.2%) in the household market. Following the nominal decline seen in previous years, the stock of mortgage-type construction loans grew at a modest rate of 3.5% (see Chart II.10). Because of this, the share of construction credits within the household credit portfolio declined further, dropping to 33% by the end of the first half of 2000. This low growth rate in housing construction lending is a result of the repayment of the old-type credits and the expansion in new credits.

The market has recovered with the introduction of the housing subsidy scheme, amended in favour of the customers (with a relaxation of the originally stringent eligibility conditions for the subsidised housing construction credits in July, additional growth in housing construction credits has been registered from the second half of 2000, with their share increasing to the debit of consumer and other credits). In order to remain competitive in this segment, banks reduced the rate on non-subsidised construction credits quite significantly (by 5%). Mortgage coverage is characteristic in the case of construction credits – the risk arising from the possible development of a real estate market price bubble is limited as banks tend to include the property used as coverage well below its market value.

Foreign-exchange-based credits have also appeared among the products offered to households, which may be attractive for customers owing to their lower announced rates.

Presumably, a number of conditions facilitated the increase in the consumer and other credit portfolio of the household sector. First, it seems that households are trying to compensate for consumption postponed in earlier years. Second, they probably have greater confidence in the favourable economic prospects and in a lasting improvement in the income position of their own household, in spite of the more restrained rate increase in their real incomes. Thus, they now tend to regard borrowing as less dangerous. Households' demand for credit is practically insensitive to interest rates, as indicated by the still exceedingly high real rate level, in spite of the substantially increasing stocks (see Chart II.11). The "total credit cost indicator", which quantifies the cost impact of fees and commissions as well frequently exceeds 30%. At the same time, the banks, which have undertaken costly development and investment programs, have an interest in vigorously expanding their business activities. Retail lending is gradually expanding particularly with the establishment of the conditions for the secure operation of the consumer credit business line; there is no effective quantitative limit on the supply of credit. Banks have begun to compete for household customers – for the time being, however, this is manifested not so much in the price, but much more so in the new kinds of loan facilities (primarily commodity purchase credits and personal loans), in the increasing number of locations where the service is provided, onsite services (shopping centres, car dealers, etc.), in more rapid and streamlined administration and in advertising. With competition becoming more intense, we expect a decline in household real lending rates in the coming years, although this is unlikely to be very spectacular, due to the strong demand, the high fixed handling costs of household lending, the higher probability of default relative to the corporate sector and a shift towards higher-risk segments. Presumably, the creditworthiness of

Chart II.10 Household credits
(for housing, consumption and other purposes)

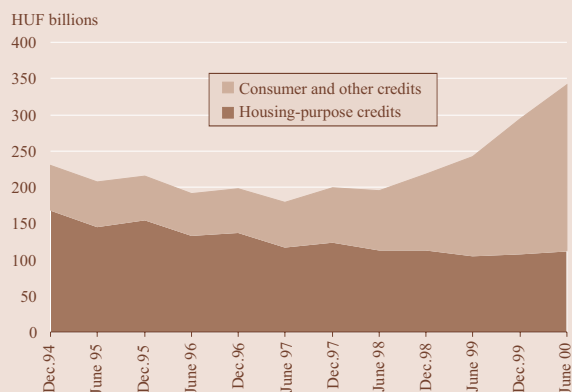
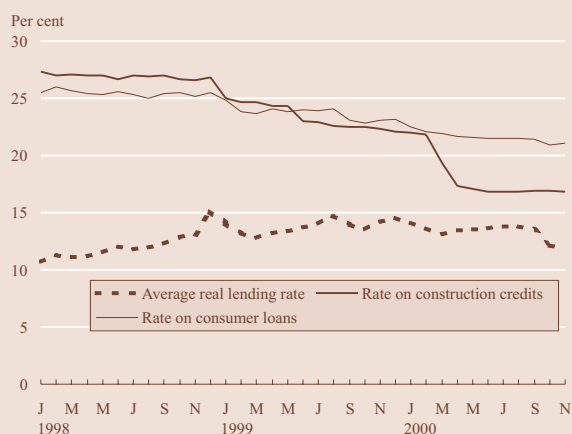
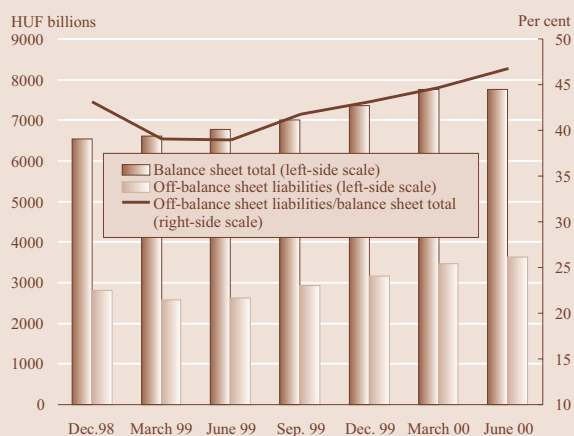
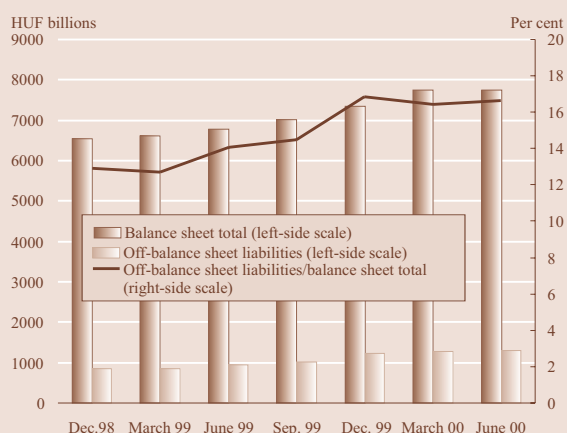


Chart II.11 Household lending rates



* To calculate the real rate, the inflation consensus published by Reuters was used. The 12-month ex ante value was derived from the December expectations of inflation by way of interpolation.

Chart II.12 Off-balance sheet liabilities of the banking sector at contract value**Chart II.13 Transaction risk weighted off-balance sheet liabilities of the banking sector**

the public will be the limit to the dynamic expansion of lending over the longer term.

Within the household credit market, the market of car purchase credits deserves special mention, as this segment of the market is already in a relatively mature phase. Thanks to the entry of a new agent in the market, the rate on car purchase credits fell drastically at the end of 1996 and early in 1997 and has since 1998 been substantially lower than the average consumer credit rate in the banking sector. The lower rate on car purchase credits can only partly be justified with the competition among market agents, because these credits are of lower risk with the coverage (the car) backing them and the insurance that must be taken out.

Exposure to off-balance sheet lending risk

A marked change was observed in the off-balance sheet activities of the banking sector, primarily owing to forward transactions beginning in the second half of 1999. After the Russian financial crisis in 1998, in spite of the plunge in the volume of forward transactions at contract value that lasted until July 1999, we observed an increase in the risk of off-balance sheet activities. In the second half of 1999, the volume of forward transactions at face value again increased dynamically. This process continued in the first half of 2000, as a result of which the off-balance sheet activities of the banking sector at contract value expanded substantially (see Chart II.12). The increase in the value of off-balance sheet activities weighted with transaction risks – i.e. of the credit equivalent value – shows a much lower rate of growth, owing to the decrease in the average maturity of contracts (all in all, the expansion was no more than 4.6% in the first half of 2000), in contrast to 1999 growth, which exceeded 40% (see Chart II.13).

The use of weights according to Hungarian legal regulations, which are higher than the Basle recommendations, is warranted because of the lower liquidity and higher volatility of the domestic market. With the use of weights evolving in accordance with the future approximation of the characteristics of the Hungarian market to those of the markets of the Union, the changes in maturity will have a smaller impact on credit equivalent values.

The rate of expansion in the portfolio of contingent liabilities at contract value was lower than in the first half of 1999. Credit lines belonging to the various risk categories not yet drawn down increased equally, which renders the maintenance of the credit expansion probable.

Forward liabilities at contract value have nearly doubled since June 1999. Interest rate transactions, again considered at contract value, grew at a substantially more modest rate, while forward transactions in securities were virtually fully wound up. The

Foreign exchange activities of the banks in the derivative markets

The banks began to conduct their activities in the derivative markets early in 1995. By then, the technical, institutional and regulatory conditions, which enable engagement in activities of this type, were largely in place. In parallel with this, for reasons of risk management, profitability and other considerations (such as advantages arising from the legal circumvention of certain regulatory requirements), demand for forward transactions began to appear to an increasing extent on the part of both banks and their customers. Initially, another motivating factor in these transactions was that some of the banks (those held by non-residents) were well equipped with foreign exchange, while others with forint on the liability side. It took some time until the banks founded by non-residents were able to build up a stable domestic clientele for the collection of funds.

With the establishment of the credibility of the crawling peg exchange rate regime, the nature of foreign exchange market speculation changed. In the pre-1995 exchange rate regime, speculation against the forint strengthened together with the intensification of expectations of devaluation. From the second half of 1995 until August 1998, speculation for the forint characterised money markets. Through the forward sale of foreign exchange, speculators attempted to exploit the difference between the forward exchange rate and the spot rate expected upon maturity, in view of the fact that the forward foreign exchange rate continuously contained a higher implied devaluation (derived from interest rate parity) than that announced in advance by the central bank. Speculators had confidence in the sustainability of the exchange rate regime and, expecting a declining settlement price, sold foreign exchange forward, then they closed their positions prior to maturity or waited until maturity and settlement. Banks held forward short positions, through which they either hedged an open foreign exchange position in their balance sheets or re-hedged the short position opened in this way in the interbank foreign exchange market. Both resulted in relatively risk-free profit for them.

The need to comply with regulations concerning open positions forced banks to conclude forward foreign exchange contracts. The banks subscribed to bid prices in the stock exchange whose interest content was below the yields in the government securities market or the central bank yields. In this way, banks and speculators shared the profits arising from the interest difference between them, while the total exchange risk was borne by the speculator. If a bank found itself with an open position from buying forward, it could hedge against this by selling forward in the interbank market. The interbank market is more liquid than the stock exchange, margins are narrower and the interest content of forward transactions is closer to market rates. Together with the commissions charged on the transactions, banks were again able to realise significant profits.

In 1996 and 1997, the banks' activities in the derivative market expanded in an exceedingly dynamic way. The share of the foreign exchange forward and futures contracts in the total stock of forward liabilities fluctuated around 75% throughout these two years. In 1998, the activities of the banking sector in the derivative market evolved differently from the tendencies of 1996 and 1997. This was fundamentally attributable to the Russian crisis and the consequent changes in Hungarian money and capital markets. Over 1998, forward liabilities decreased by close to 4%. There were, however, no substantial changes in the structure of forward transactions: at the end of 1998, the share of foreign exchange transactions was 77%.

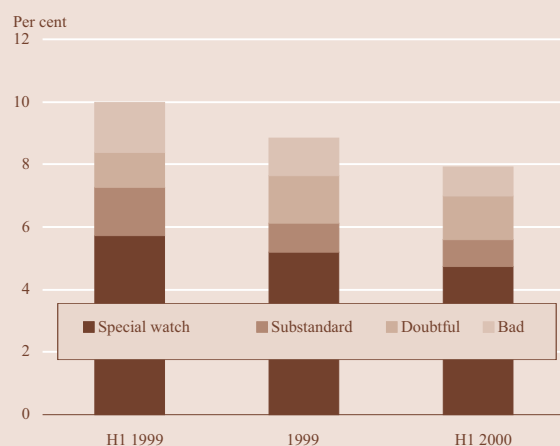
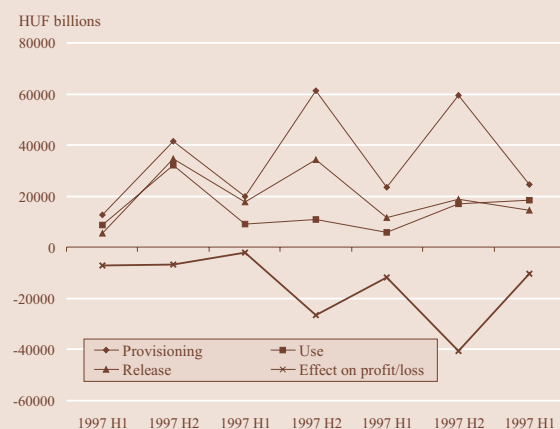
The role of speculators became stronger in the first half of 1998, as expectations concerning the broadening of the band of exchange rate fluctuations appeared with increasing strength among market agents relative to the preceding two years. Between July and December, forward liabilities fell by 33%. This drop was attributable to plummeting stock exchange prices due to the Russian crisis and the closing and non-renewal of positions induced by the increased exchange rate volatility. This also indicated that a substantial portion of the forward transactions concluded by the banks served purposes other than hedging *stricto sensu*. In the second half of the year, counterparty risk, in addition to market risk, caused severe losses to brokerage firms and thereby to their parent banks. In the first half of 1999, the activities of the banks in the forward foreign exchange market slackened further. Speculators essentially disappeared from the market; banks were able to deal only with one another. In the second half of the year (particularly in the fourth quarter), the market recovered. In the first half of 2000, the recovery of the forward foreign exchange market continued. By the end of the half-year, the stock of the banks' open forward foreign exchange transactions rose to HUF 1,179 billion at face value.

share of FX transactions within forward liabilities approached the level measured prior to the Russian financial crisis reaching 85.3% at the end of June, in contrast to 76.6% a year before.

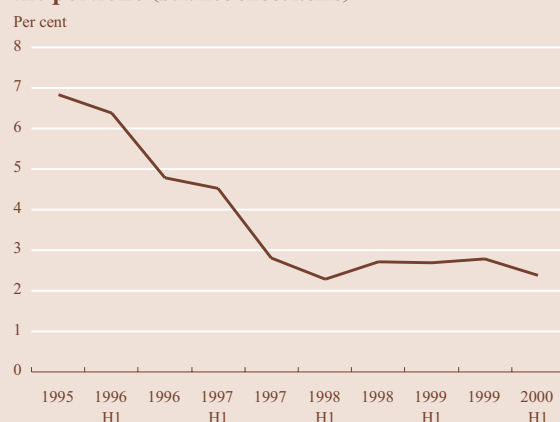
The maturity structure of forward liabilities changed considerably in favour of short-term transactions. More than half of all foreign exchange transactions were concluded for terms of 3–12 months, whereas one-tenth of them had a maturity of over one year. Again in the case of interest rate transactions, it was primarily shorter-term transactions that expanded: the share of those maturing in less than one year reached 31% by the end of June, while a year earlier their share was no more than 10%. The share of transactions concluded for terms of less than 3 months increased by a multiple over the year from the end of the first half of 1999 to the end of the first half of 2000.

Portfolio quality

In parallel with the dynamic recovery in lending, which began in the second half of 1999, total assets and off-balance sheet liabilities to be rated of credit institutions functioning in the form of

Chart II.14 Portfolio quality**Chart II.15 Risk provisions***

* Net of Postabank, Hungarian Development Bank, Reálbank.

Chart II.16 Weighted rated stock as a percentage of the portfolio (balance sheet items)*

* Net of Postabank, Hungarian Development Bank, Reálbank..

companies limited by shares increased by nearly 12% in the first half of 2000, in line with the tendency registered in the second half of the preceding year. Growth affected both balance sheet and off-balance sheet items. Within the total stock to be rated, the share of balance sheet items is still on the decline, making up 57.5% at the end of the first half of 2000. Due to the fact that off-balance sheet items are carried at contract value, this does not mean that the banking sector is undertaking a growing share of its risks off balance sheet. The portfolio's quality composition improved further, and the combined stock of rated assets (special watch, substandard, doubtful and bad) remained at the same level (HUF 691 billion), while its share within the portfolio sank below 8%, unparalleled since the period preceding the Russian crisis. This improvement is attributable partly to the recovery in lending, as by far the greater part of the new credits are rated in the problem-free category over the short term by the very nature of the transaction. On the other hand, however, this is also a result of a favourable shift within the structure of rated items: the stock of bad debts associated with the highest provisioning requirement declined even in nominal terms (see Chart II.14).

Banks have become more prudent in their provisioning practice, underlined by the fact that in spite of the improving portfolio of the sector, the average extent of coverage by provisions rose within the individual rating categories, with the exception of the stock of special watch assets. With the sale of a portion of the claims, HUF 16.9 billion in provisions were used and HUF 1.3 billion released over the first six months of 2000. For other reasons, provisions amounting to HUF 2.7 billion were used and HUF 18.5 billion were released. Write-off over and above provisions amounted to HUF 1.8 billion.

For several years, a delay in provisioning could be observed at the banks related to the seasonality in the practice of rating the portfolios. The year-end portfolio rating practice of the banks, which is substantially more stringent than the interim rating, is not reflected in changes in the quality composition of the portfolio, because portfolio cleanup (sale and write-off of credits) is also concentrated in the second half of the year and, in particular, in the last quarter⁶ (see Chart II.15 and II.16).

In analysing the lending risks faced by the banking sector, it is necessary to address the household credit portfolio, as more than 15% of the stock of placements to household consists of rated stock and the share of bad debt is very high at close to 4%. Rated stock increased by 22% in the first half of 2000. Nearly one-half of the banking sector's rated household credit portfolio is composed of the combined rated stock of three banks, attributable to the prudential rating practice of these banks (they automatically put new credits into the "special watch" category). At some banks, fine-tuning of their rating practices is expected in parallel with the development of their information systems. A substantial portion of the stock rated as bad consists of the old type of credits. The high share of the rated portfolio arises fundamentally from the fact that banks regard households as a higher-risk group of clients than companies, hence they pursue more prudential

⁶ The analysis does not include Postabank, the Hungarian Development Bank and Reálbank, because the development in the quality composition of the portfolio of the banking sector and its provisioning were greatly distorted by the fact that the deterioration in the portfolios of these three banks that had taken place earlier was discovered at the end of 1998.

rating and provisioning practices, which partly explains the high real interest rates in the household market.

Exposure to country risk

In the first half of 2000, the ratio of foreign exposures to the total stock of exposures⁷ declined slightly after the decelerating growth registered in earlier years owing to the upswing in FX credits extended to domestic companies reaching 10.8% by the end of the half-year (this figure was 12.2% at the end of 1999). At the same time, the exposure of the banking sector to country risk increased slightly, underlined by the 30% growth in country risk provisions. Beside the decline in banking transactions aimed at countries regarded as risk-free, total placements to countries in the second and the third categories⁸ increased – their volume, however, at the level of the banking sector is still not significant. By far the greater part of placements within the balance sheet continue to be interbank placements. Contingent and future liabilities are also significant; however, 94% of these are outstanding against countries from the practically risk-free group (see Chart II.17 and Table II.1). Although there was a slight decline over the first half of the year, country concentration continues to be substantial. More than half of the foreign placements of the banking sector is aimed at four countries. This, however, does not constitute any major risk, as all of these countries belong to the first category which is regarded as risk-free. Some 90% of foreign placements go to 16 countries, of which 12 countries are in the risk-free first category and 3 in the low-risk second category. At the level of the banking sector, exposure to Russia alone constitutes a risk worthy of mention, although this declined somewhat relative to the status at the end of 1999.

Exposure of the banking sector to market risk

With its current structure of activities and balance sheet, the Hungarian banking sector is currently exposed to potential losses arising from market risk only to a moderate extent. Over the medium and long term, however, with the expected growth in securities and foreign exchange market trading activities, it will be necessary to expect an increase in the weight of market-type risks.⁹

Interest rate risk

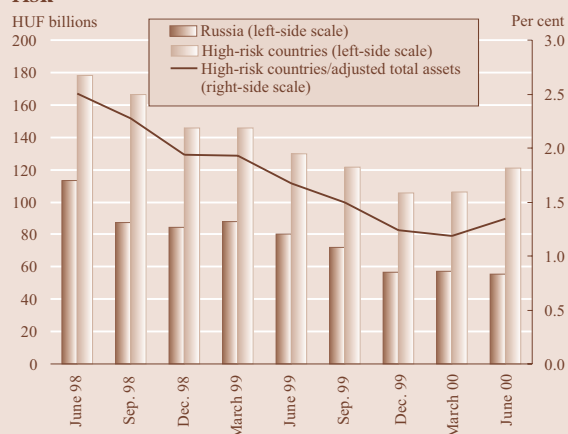
Measured by the 90-day forint re-pricing gap in proportion to the balance sheet total, the banking sector's exposure to interest rate risk declined further, from minus 7.9% at the end of 1999 to minus 7.2% by the end of the first half of 2000. As a result of the halting or rather reversal of the process of disinflation in the second half of the year, the negative forint re-pricing gap narrowed further in the last six months of the year (see Chart II.18).

⁷ Balance sheet items were taken into consideration with a weight of 100%, contingent liabilities at 50%, future liabilities at 10%.

⁸ The first category includes the countries regarded as risk-free, while the fourth category those that are described as the highest-risk countries.

⁹ The study reporting of the results of the stress test addresses the impact of an eventual major and sudden shift in interest rates and exchange rates on the stability of the banking sector.

Chart II.17 Exposure of the banking sector to country risk*



* Balance sheet items calculated with a weight of 100%, contingent liabilities with 50%, future liabilities with 10% (adjusted total assets).

Table II.1 The foreign assets of the banking sector by country risk category

	1999 Ft billions	Share	1st half 2000 Ft billions	Share	Half 2000 1999
Category 1	929.3	89.8	852.9	87.6	92
Category 2	31.6	3.1	44.8	4.6	142
Category 3	7.5	0.7	14.9	1.5	199
Category 4	66.7	6.4	61.2	6.3	92
– Russia	56.4	5.4	55.5	5.7	98
Total	1,035.1	100.0	974.0	100.0	94

Chart II.18 90-day cumulated HUF and FX re-pricing gaps of the banking sector as a proportion of the balance sheet total

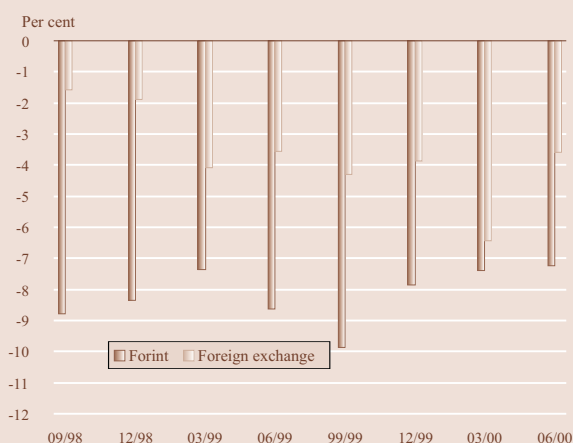
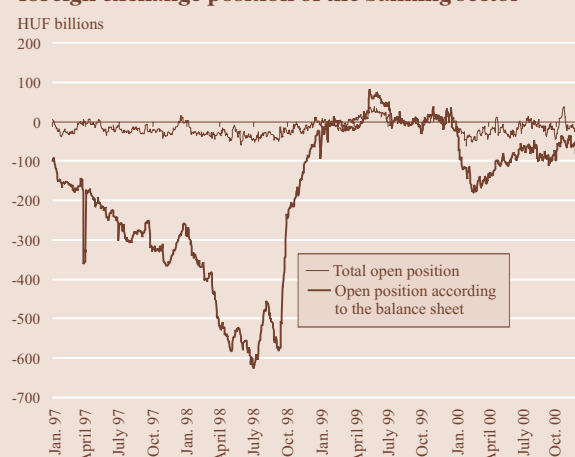


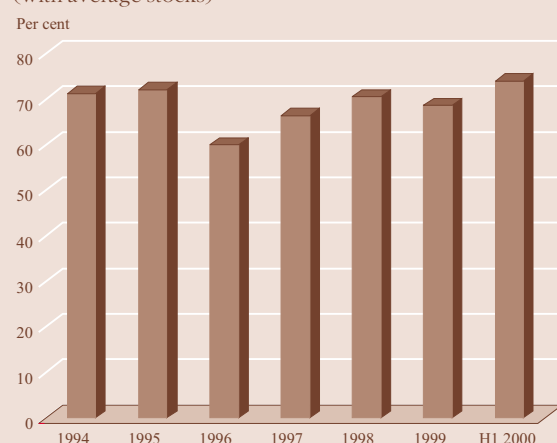
Table II.2 Major indicators of the banking sector's exposure to interest rate risk*

	1999	H1 2000
90-day cumulated forint gap (HUF billion)	-578	-560
90-day cumulated foreign exchange gap (HUF billion)	-285	-278
90-day cumulated forint gap/balance sheet total (%)	-7.9	-7.2
90-day cumulated foreign exchange gap/balance sheet total (%)	-3.9	-3.6
	H1 1999	H1 2000
Interest income (HUF billion)	132	148
Average interest-bearing assets/average interest-bearing liabilities (%)	108.00	108.70
Interest margin (interest income/average balance sheet total) (%)	4.02	3.87
Spread (interest income/average interest-bearing assets-interest expenditure/average interest-bearing liabilities)	3.61	3.60

* The aggregated re-pricing gaps were calculated without the off-balance sheet items of the Rákóczi Bank, Kvantumbank and Takarékbank, as they would have substantially distorted the figures for the banking sector.

Chart II.19 The total and the balance sheet open foreign exchange position of the banking sector

* Negative values represent positions in favour of the forint.

Chart II.20 Credit/deposit ratio in the banking sector (with average stocks)

The potential impact of the foreign exchange re-pricing gap on profits is much more limited owing to the size of the gap and the smaller scale of the changes in interest rates. After the substantial widening in the course of 1999, the cumulated 90-day foreign exchange re-pricing gap was HUF 7 billion closer at the end of the first half of 2000 than the value at the end of 1999, and its ratio to the balance sheet total decreased by 0.3%. The expansion of the gap proportionate to the balance sheet total in the first quarter, then its narrowing in the second quarter, is partly attributable to the reinforcement of FX-HUF conversion aimed at utilising the difference between HUF and FX interest rates and then its subsequent slackening, and partly to deficiencies in reporting¹⁰ (see Table II.2). In spite of the uniform decrease in the shares of forint and foreign exchange assets and liabilities with durations of no longer than 3 months, it can be stated that the banking sector's interest-bearing assets and liabilities continued to be relatively rapidly re-priced. The share of forint assets with a re-pricing period of less than 3 months decreased from 76% at the end of 1999 to 74%, while the share of forint liabilities re-priced in maximum 3 months decreased more than this, from 94% to 90%. The share of foreign exchange assets re-priced over not more than 3 months decreased by 3% to 69%, while the share of foreign exchange liabilities re-priced over at most 3 months, by no more than 2 percentage points to 81%.

Exchange rate risk

In addition to corporate lending, the change in the denomination composition of the balance sheet structure of the Hungarian banking sector also affected placements to the central bank and to non-residents as well as the drawing in of funds. Similarly to the period prior to the Russian crisis, there is once again a surplus in foreign exchange liabilities in the Hungarian banking sector: its magnitude, however, is only a fraction of the value observed in the summer of 1998. In relation to exchange rate risk, it should be underlined that banks again began to speculate in favour of the forint from the end of December 1999 and, by mid-February 2000, they built up a forint long position of HUF 180 billion according to the balance sheet. To prevent the build-up of an excessive open foreign exchange position, the central bank introduced or announced a number of measures (reduction of the main 2-week deposit rate several times in the first quarter, introduction of the NBH bond, rendering the keeping of an on balance sheet open foreign exchange position more expensive through mandatory reserve regulations). As a result, the banking sector gradually liquidated the majority of its forint asset surplus – thus, by the end of June, the forint long position of the banking sector according on balance sheet was no more than around HUF 70 billion (see Chart II.19). Accordingly, the utilisation of the open position limit jumped to nearly 60% by mid-February, sinking to the level customary in 1999 (30–40%) by June 2000. The decline in the balance sheet open position was realised not by winding up foreign liabilities, but by increasing foreign exchange placements (primarily FX loans to the corporate sector).

¹⁰ In case of spot sales of foreign exchange hedged by forward purchase of foreign exchange, banks characteristically do not present the forward leg in the reports related to interest rate sensitivity.

The liquidity of the banking sector

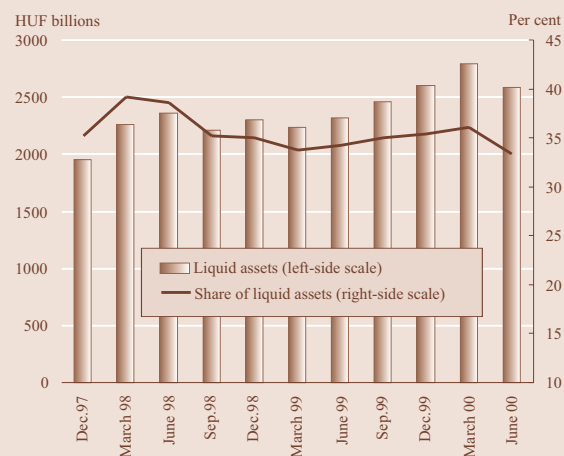
The liquidity position of the banking sector has been well balanced for years. The ratio of client credits to client deposits has been appropriate, even though growth in client deposits could not keep up with the pace of the credit expansion (the stock of household forint deposits representing the largest weight increased by no more than 1.7% in nominal terms over the first half of the year), as a result of which the ratio was higher in the first half of 2000 than in the preceding six years (see Chart II.20). The banking sector shows a reassuring picture from the viewpoint of both asset side and liability side liquidity, as, on the one hand, the share of the banks' liquid assets in the balance sheet total is high and, on the other hand, the share of drawing in money market funds in external liabilities is low. The parallel growth in liquid assets and foreign interbank funds in the first quarter then the decline in their shares in the second quarter does not indicate any substantial change in the banks' liquidity position, rather it is a manifestation of the renewed invigoration and subsequent slackening of FX-HUF conversion aimed at exploiting the difference between forint and foreign exchange interest rates (see Charts II.21 and II.22). The effect of this is reflected in the changes in the composition of liquid assets over the first half of the year: until the end of February, the share of forint deposits kept with the NBH increased. Then, with the NBH reducing its deposit rates in several steps, these deposits were wound up by the end of May, and the excess liquidity of the banks flowed into other assets, including government securities and NBH bonds.

The capital position of the banks and changes in capital adequacy

The ownership structure of the banking sector presents a reassuring picture. The solid commitment of foreign shareholders to their Hungarian subsidiaries is reflected in the fact that the nearly 8% increase in registered capital is attributable almost in full to foreign shareholders. Foreign ownership has continued to gain ground: by the end of June 2000, 67.6% of the Hungarian banking sector was held by non-residents. Among these shareholders the largest group is that of foreign credit institutions, which now hold a 53% share in the registered capital of the banking sector.

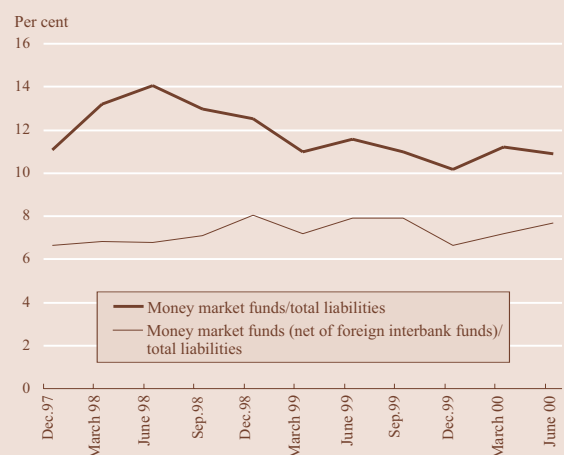
The capital adequacy ratio of the banking sector was 14.2% at the end of the first half of 2000, slightly exceeding the value of 13.9% registered at the end of the first half of 1999. According to legal regulations, interim profits may not be taken into account when calculating the regulatory capital; adjusted by these profits, the ratio would have been 1.2 percentage points higher. When expected dividend payments are also taken into account, we estimate the capital adequacy ratio to be around 14.6–14.8% (in contrast to 15% at the end of 1999). The value of the ratio can be described as high in an international comparison. All in all, it indicates that the Hungarian banking sector has adequate capital resources. At the same time, the fact that specialised credit institutions considerably improved the average, as without them the capital adequacy ratio was no more than 12.6%, should call for circumspection in the assessment.

Chart II.21 Share of liquid assets*



* Liquid assets: interbank short forint and foreign exchange assets plus short forint deposits with the central bank + government papers (net of consolidation bonds) + settlement accounts and cash in hand.

Chart II.22 Money market exposure*



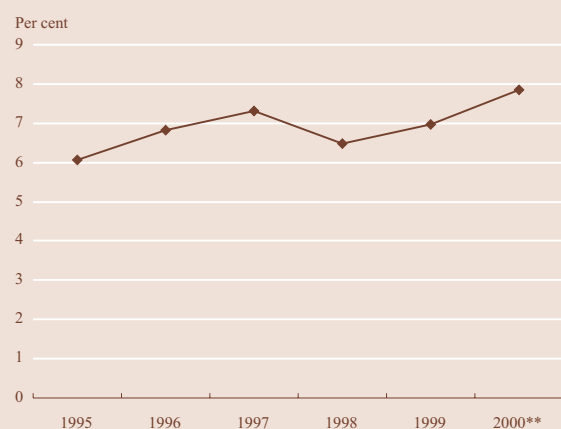
* Money market funds: interbank funds + central bank active repo.

Table II.3 Composition of regulatory capital

	Per cent		
	1st half 2000/1st half 1999	1st half 1999	1st half 2000
Primary (Tier 1) capital	128.3	85.1	89.2
Supplementary (Tier 2) capital	102.0	23.3	19.4
Amount of limit excesses to be covered by capital	125.3	8.3	8.5
Regulatory capital	122.5	100.0	100.0

Table II.4 Composition of the adjusted balance sheet total (risk weighted assets)

	Per cent		
	1st half 2000/1st half 1999	1st half 2000/1st half 1999	1st half 2000
20% weighting	106.7	5.8	5.2
50% weighting	117.7	1.3	1.2
100% weighting	118.1	74.2	73.0
Sum of weighted balance sheet items	117.3	81.3	79.5
Weighted value of contingent and other future liabilities	131.5	18.6	20.3
Weighted value of forward claims	156.5	1.4	1.8
Risk provision (-)	150.1	-1.3	-1.6

Chart II.23 Coverage ratio*

* (Equity + provisions on substandard, doubtful and bad assets) – (substandard + doubtful + bad assets) / total assets – (substandard + doubtful + bad assets) + provisions on substandard, doubtful and bad assets).

** At the end of the first half of the year.

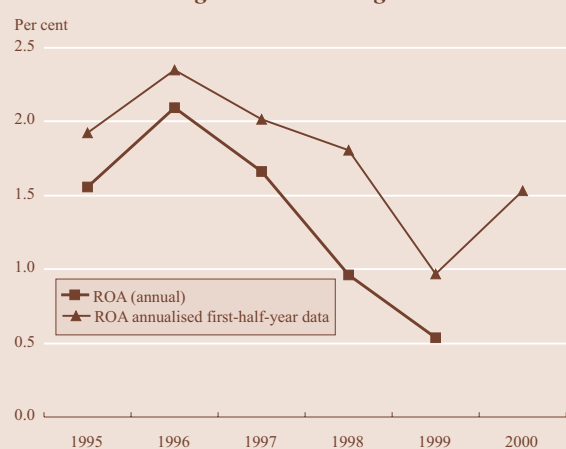
Table II.5 Profit/loss in the banking sector

	HUF billions	
	1st half 1999	1st half 2000
Net interest income	132.3	147.6
Change in provisions	9.8	3.5
Other profits	18.4	45.8
– net commission revenue	27.2	37.4
GROSS PROFIT FROM FINANCIAL AND INVESTMENT SERVICES	160.5	197.0
Costs of banking activity	128.0	140.0
PROFIT FROM FINANCIAL AND INVESTMENT SERVICES	32.5	57.0
Other profits not from financial and investment services	0.6	0.9
ORDINARY TRADING PROFIT	33.1	57.9
Extraordinary profit	3.9	-4.0
APRE-TAX PROFIT	37.0	54.0

Table II.6 Components of the spread

	HUF billions	
	1st half 1999	1st half 2000
Average stock of interest-bearing assets	6,014	7,033
Average stock of interest-bearing liabilities	5,569	6,472
Interest income	429	391
Interest expenditure	297	244
Interest income/interest-bearing assets*	14.3%	11.1%
Interest expenditure/interest-bearing liabilities*	10.7%	7.5%
Spread*	3.6%	3.6%

* Annualised values.

Chart II.24 Changes in the banking sector's ROA *

* Net of Postabank, Hungarian Development Bank, Reálbank.

At the end of the first half of 2000, the regulatory capital of the banking sector was 22.5% higher than at the end of the first half of 1999. The total value of risk-weighted assets increased by 20% over the year (see Table II.3, Table II.4). This means that the regulatory capital of the banking sector increased in proportion to the additional risk arising from the recovery in lending. The appropriate increase in regulatory capital is attributable to the 28% expansion in primary capital over the year, in which drawing in capital (nearly HUF 50 billion increase in registered capital and HUF 27 billion growth in the capital reserve), the profit accumulation of profitable banks (HUF 17 billion increase in retained earnings), and the decrease in investment into financial enterprises (by HUF 24 billion) also played a role.

Over the first six months of 2000, risk-weighted balance sheet and off-balance sheet items together rose by 10.3%. The (transaction and counterparty) risk-weighted stock of off-balance sheet activities grew by no more than 2.7%, while the increase in the risks undertaken by the banking sector appeared primarily in the balance sheet items as a result of the recovery in client lending – in contrast to 1999, when the increase in risk appeared first and foremost in off-balance sheet items. The relatively high growth rate of risk-weighted balance sheet and off-balance sheet items registered recently requires particular attention for risk management and prudential reasons, even though it is a natural result of the development of the economy and the banking sector.

The internal (own) funds of the banking sector increased at a rate exceeding both inflation and the balance sheet total over the first six months of 2000. The primary role in this growth was played by the favourable profit development in the first half of the year. Based on the coverage ratio of the banking sector it seems that the banks' capital constitutes adequate coverage even in the event of an unfavourable external shock affecting the asset side. The slight improvement in the value of the ratio seen in 1999 is expected to continue in 2000. In evaluating the 7.9% level at the end of the first six months, it should be taken into account that owing to the seasonality of the balance sheet profit figure (interim profit/loss), the values for the first half of the year are regularly higher than the year-end values (the value for the end of the first half of 1999 was also 7.9%, see Chart II.23).

Profit/loss in the banking sector

Based on the developments in the first half of 2000, positive tendencies seem to be outlined in the profitability of the banking sector. The reduction in the spread came to an end, and there was a substantial increase in commission income. The figures on other income, operating costs and provisioning also bear witness to an improvement. The interim pre-tax profit in the banking sector amounted to HUF 54 billion in the first half of 2000, nearly one-and-a-half times the profits presented in the same period of the preceding year (see Table II.5). In contrast to the tendencies of preceding years, the number of loss-making banks declined.

In the first half of 2000, the decline in the spread came to a halt (in the first half of 1999 the spread declined by 1.1% relative to the base period, see Table II.6). Interest income was improved by the rise in the ratio of interest-bearing assets to interest-bearing lia-

Reasons for the substantial differences in profitability at half-year and at year-end

Over the past five years, the return on assets estimated by annualising the figures for the first six months of the year regularly and considerably exceeded the actual ROA of the given year¹¹ (see Chart II.24). In 1995, the fundamental reason for this was the outstandingly large, extraordinary loss appearing in the second half of the year. In the other years, part of the difference could be attributed to the seasonality in the rating practice of the banks and the related postponement of portfolio cleanup and risk provisioning. Between 1997 and 1999, another factor contributing to the substantial increase in the difference was the entry into force of the requirement concerning the general risk provision, which banks had to meet gradually over these three years. To this end, banks replenished the general risk provision up to the appropriate level again at year-end. The entry into force of the requirement to form provisions for country risk in 1998 had an impact similar in nature, but smaller in its proportion. The effects of the 1998 Russian crisis only added to all these factors. A slight seasonality in operational costs also contributed, although to a small extent, to the tendency of profits in the second half of the year to be lower than in the first half, which is due to the settlement or occurrence of certain costs at year-end. In view of the fact that the period available for the gradual replenishment of the general and country risk provisions has ended, and the banking sector has now overcome the effects of the Russian crisis, end-2000 after-tax profits may substantially exceed the value presented at half-year, and the loss of capital in real terms in the banking sector registered for the last several years may come to an end (see Chart II.25).

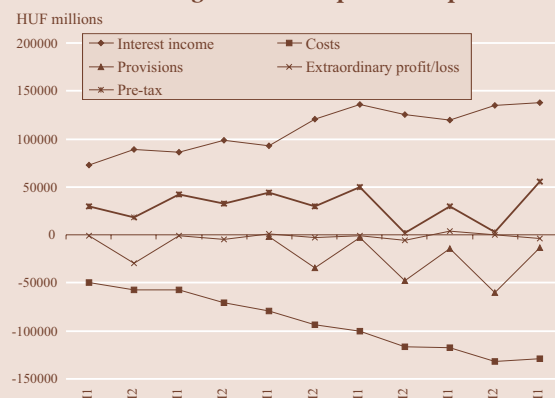
bilities. The banking sector profited from the continuation of the trend towards declining interest rates by maintaining a relatively broad negative forint re-pricing gap but, with the continuing rise in foreign interest rates, the maintenance of a negative foreign exchange re-pricing gap had an unfavourable impact. Interest income grew by nearly 12% relative to the same period of the preceding year. As, however, banks do not follow a uniform approach in presenting the profit/loss on their forward transactions, it is expedient to examine the interest difference and the profit/loss from changes in the exchange rate and forward transactions together, which increased by 13%. The rearrangement in the structure of assets observed in the first half of 2000 is also reflected in the change in the composition of interest income. With the intensification of lending activity, the share of interest revenue from credits rose by 7%, to 51% in total interest income in spite of the decline in interest rates. With the increase in foreign exchange-forint conversion aimed at exploiting the difference between forint and foreign exchange interest rates early in 2000, the share of interest revenue from the central bank also increased.

In the first half of 2000, profits from commissions were 37.5% higher than in the first half of 1999, with their share in the banking sector's trading profits amounting to 17%. The share of non interest-type income in trading profits was 31% at the end of the first six months, still well below the average in the banking sectors of the EU Member States (see Chart II.26).

In the first half of 2000, the negative result of allocation and release provisions was 51% higher than in the same period of the preceding year, as allocation declined to a lower extent than release. Provided that the banks' provisioning is actually adjusted to the risks undertaken, a decrease in provisioning is a positive phenomenon. At the same time, a decrease in the release of provisions is not necessarily unfavourable, provided that it originates from the fact that the banks no longer maintain excessive provisions as they did in earlier years (see Table II.7).

¹¹ The analysis does not include Postabank, the Hungarian Development Bank and Reálbank, because the development in the quality composition of the portfolio of the banking sector and its provisioning were greatly distorted by the fact that the deterioration in the portfolios of these three banks (which had taken place earlier) was discovered at the end of 1998.

Chart II.25 Changes in certain profit components*

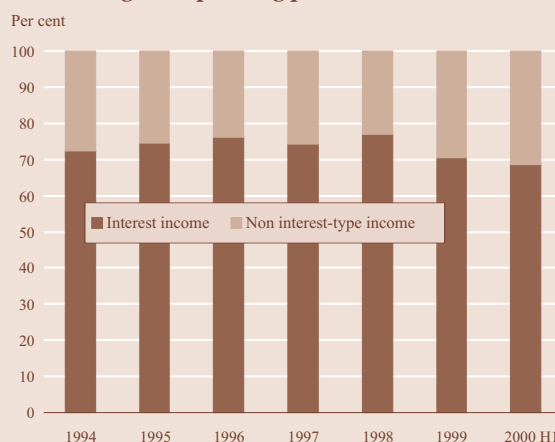


* Net of Postabank, Hungarian Development Bank, Reálbank.

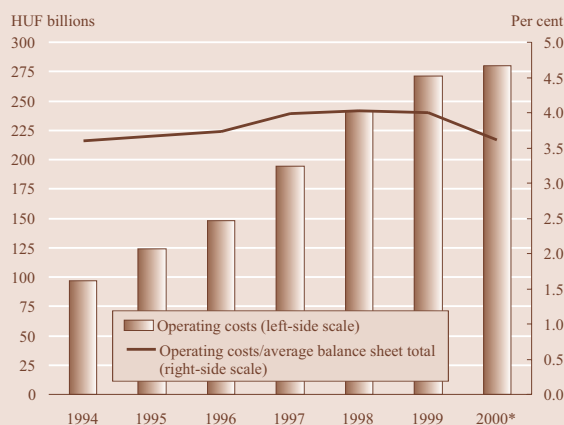
Table II.7 Impact on the change in provisions on profits

	HUF millions		
	1st half 1999	1st half 2000	1st half 2000/1st half 1999
Provisioning	52,744	39,459	75%
Release of provisions	42,087	23,375	56%
Total	10,657	16,084	151%
Result of portfolio cleanup	-9,932	-7,798	79%

Chart II.26 Share of interest and non interest-type income in gross operating profits



* Net of Postabank, Hungarian Development Bank and Reálbank.

Chart II.27 Ratio of operating costs to the balance sheet total

* Data for the 1st half 2000, annualised.

Relative to the same period of the preceding year, the increase in the costs of operations exceeded the rate of inflation in the first half of 2000 as well, although only to a minimal extent. At the same time, the 23% growth in the gross profit from financial and investment services significantly exceeded the 10% growth in costs, thus the cost efficiency of the banking sector seems to be improving after the deterioration observed over recent years. Depreciation write-off rose considerably, by 29%, as a result of the investment programs of the past years (related primarily to the building up of the retail market and the IT development programs), while rents increased by 16% (see Chart II.27).

III. The position of non-bank financial intermediaries¹

Size and concentration of the financial intermediary market²

As of June 30, 2000, the balance sheet total (total assets) of the financial intermediary sector amounted to HUF 10,291 billion, corresponding to growth of 7.9% since the end of the preceding year. During this period, the activity of credit institutions grew by no more than 5.5%, in contrast to non-bank financial intermediaries which demonstrated a rise of 18.8% (see Chart III.1). While the activity of credit institutions did not expand in real terms,³ that of non-bank intermediaries was up by 11.6%. The tendency for every type of non-bank institution (with the exception of investment firms) to grow also continued in 2000. Investment funds and pension funds boasted the strongest growth, while the performance of investment enterprises declined even in nominal terms (see Table III.1).

Although the share of credit institutions is still decisive in the financial intermediation sector, it is remarkable that the share of non-bank institutions amounted to almost 20% by the end of the half-year. It follows that the role of these institutions has a considerable impact on the development of the money and capital markets, and we may expect a further increase in their weight. The strengthening of the money and capital market role of non-bank financial intermediaries may have been a factor in the substantial growth of the lending activity of the banks.

As discussed in detail in Chapter I, signs that non-bank financial intermediaries are gaining strength can also be seen in the changes in the structure of the households' financial savings (see Chart III.2).

There were 487 non-bank financial intermediaries at the end of the first six months of 2000 (23 less than at the end of 1999), with an overall declining tendency. A fairly vigorous process of mergers could be observed among investment firms and pension funds, while the number of financial enterprises is currently expanding.

In spite of the large number of market agents, strong concentration was seen in accordance with the size of the activity at virtually every type of institution, but particularly in respect of insurance companies, investment funds and private pension funds

¹ The end-1999 data for non-bank financial intermediaries presented in the August *Report on Stability* were preliminary, not audited data, hence they may differ from those presented in this *Report*.

² The financial intermediary sector is understood as credit institutions and non-bank financial intermediaries (insurance companies, investment firms, financial enterprises, investment funds and pension funds).

³ Consumer price index relative to December 1999: 105.5%

Chart III.1 Size of the financial intermediation sector

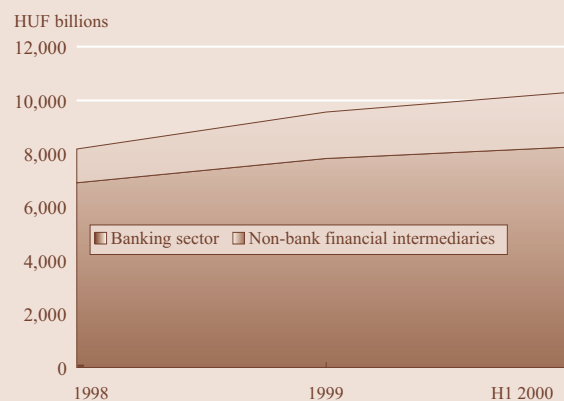


Table III.1 Changes in the balance sheet totals of the various institution types

	Balance sheet total		Change	Distribution	
	1999	30 June 2000	30 June 2000/1999	1999	30 June 2000
	HUF billions			Per cent	
Credit institutions	7,807	8,239	105.5	81.9	80.1
Investment firms	167	154	92.0	1.8	1.5
Net assets of investment funds	429	557	129.8	4.5	5.4
Insurers	565	648	114.7	5.9	6.3
Pension funds	249	331	132.9	2.6	3.2
Financial enterprises	317	362	114.3	3.3	3.5
Total	9,533	10,291	107.9	100.0	100.0
Net of credit institutions	1,727	2,052	118.8	18.1	19.9

Chart III.2 Distribution of households' financial assets

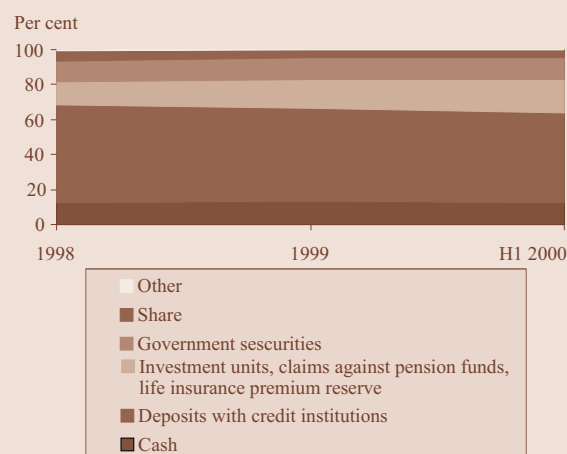


Chart III.3 Number of non-bank financial intermediaries and the degree of concentration at the end of the first six months of 2000

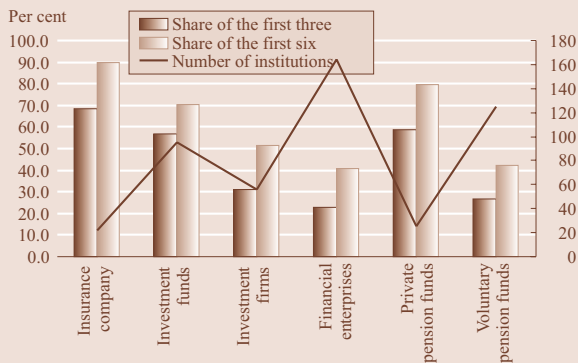
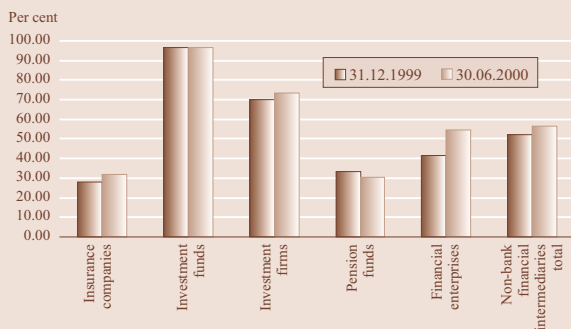


Chart III.4 Share of non-bank financial intermediaries related to banks



(see Chart III.3). Owing to reasons related to economies of scale, we expect a further reduction in numbers (by mergers and acquisitions, winding up, liquidation, etc.) in the future.

To decide the question of whether the decline in the share of credit institutions in the sector of financial intermediaries is genuine, we examined to what extent non-bank financial intermediaries are related (directly or indirectly) to commercial banks.⁴

The share of institutions related to credit institutions is decisive in the sector of non-bank financial intermediaries, and in the six months under study they increased their share by close to 4 percentage points to 56.4% (see Chart III.4). Financial intermediaries backed by banks expanded their activities dynamically by 27.9% during the period under study, while those that did not have the backing of credit institutions grew by no more than 8.8%. In practice this means that, from a certain perspective, the loss of ground by the banks in the financial intermediation sector is only an illusion, and their influence extends well beyond the direct collection of deposits in the field of household savings.

Almost all of the investment funds are related to an investment fund manager backed by a credit institution, indicating that the banks pursuing a market strategy in terms of increasing the acquisition of funds through this channel. The role of credit institutions is decisive among shareholders of investment firms as well, but their weight in the securities market is even higher, as nearly a third of the commercial banks have universal banking licenses. In respect of financial enterprises, companies enjoying the backing of banks gained quite some ground, which is attributable to the fact that they found it easier to acquire funds required for growth.

In terms of insurance companies and pension funds, backing by banks has not been decisive; growth in the case of the former and decline in the case of the latter was observed over the past six months. We expect an increase in the weight of the banks in respect of insurance companies in the near future, as more and more banks have decided to enter the market in the insurance sector or to enhance their activities there. The foundation of insurance companies is not present as an independent market objective in credit institutions' business policies, but as a supplementary service related to lending activity (e.g. property insurance linked to mortgage lending).

Investment firms

The decline in the number of functioning investment firms continued to be rapid in the first half of 2000. In 1997, there were 89 brokerage companies in Hungary – the number decreased to 87 by the end of 1998, and to 65 by the end of 1999. Of the 62 investment firms registered as of June 30, 2000 no more than 56 were actually operational. Of these, 9 functioned as commission brokers, 27 as securities traders and 20 as investment companies.

Stocks from companies whose operation was terminated or suspended were transferred by way of client transfer to the par-

⁴ We considered financial intermediaries belonging to a bank group (investment firms, insurance companies, financial enterprises) and the investment funds and pension funds that do not belong to bank groups but which ultimately broaden the range of financial services offered by banks as financial intermediaries related to banks.

ent banks or other investment firms. Taking into account the expansion in the investment service activities of credit institutions, it can be established that investment service as an activity declined to a lesser extent than could be concluded from the changes in the balance sheet total of investment firms.

At the end of June 2000, the balance sheet total of investment service providers amounted to HUF 153.5 billion, 8.3% less than at the end of the preceding year. Within the sector, however, the data of groups by type of activity and within that the data of the individual companies shows wide deviation. The strongest decline occurred at trading companies, while there was slight growth at investment companies. The weight of companies functioning as commission brokers is still not perceptible at the level of the sector (see Chart III.5).

Investment service providers' liquid assets (cash and government securities) amounted to HUF 60 billion (39.3% of the balance sheet total) on June 30, 2000, which corresponds to the figure for the end of the preceding year in nominal terms (see Chart III.6). The average level can be described as adequate for liquidity management, but the share of liquid assets in the balance sheet totals of individual companies fluctuated in a very wide range (between 0.7%–80%). At one-third of the companies functioning without the backing of a credit institution, this ratio remained below 10% pointing to particular risk. Total participations, shares and other securities did not change to any significant extent relative to the end of the past year – their share, however, rose by 3 percentage points (to 23%).

The strong decline in stock exchange trading is also reflected in the balance sheets of investment service providers. The stock of claims arising from stock exchange settlements and outstanding against the clearing house fell by nearly a half, while their share in the balance sheet decreased by 9% to 15% relative to the end of 1999. Similar tendencies can be observed also on the liability side, where the share of liabilities related to stock exchange transactions dropped by 5 percentage points to 7%. In contrast to stock exchange transactions, total claims and liabilities arising from OTC transactions nearly doubled and their share also rose by 2% and 6%, respectively.

The equity of the sector was HUF 62 billion on June 30, 2000, which – fundamentally due to the companies withdrawing from the market – decreased slightly relative to the end of 1999, but its share within the balance sheet total rose by 2.5% to 40.5% (see Chart III.7). The equity to registered capital ratio evolved at around 150% during both periods showing substantial differences at the level of the individual companies: at 17 companies, the value of equity did not reach that of the registered capital.

Short-term credits amounted to HUF 17.2 billion at the end of June 2000, having declined by 20% since the end of 1999. A rearrangement took place among short-term liabilities from bank loans towards intercompany lending, which may be connected to the unfavourable market rating of the position of the securities market and securities market agents.

Total liabilities outstanding against clients amounted to HUF 17 billion, showing a drop of 15% relative to the end of the preceding year. The decline in long-term liabilities was due to the decrease in debts on bonds and that of the subordinated loan capital (owing to one of the companies which withdrew from the market).

Chart III.5 Balance sheet total of investment firms



Chart III.6 Distribution of the main asset items of investment firms

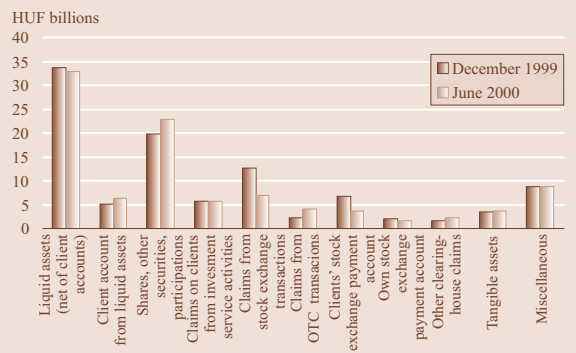


Chart III.7 Distribution of the liabilities of investment firms

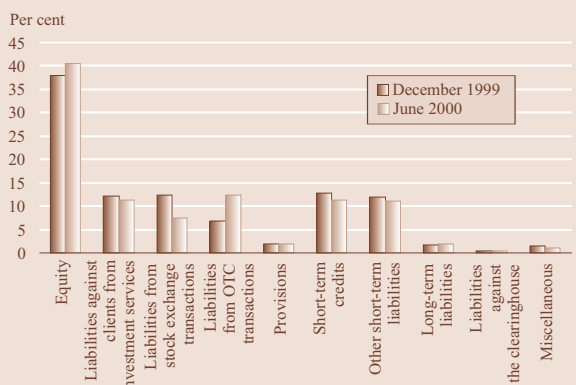


Table III.2 Profits of investment firms

	HUF millions		
	30.06.1999	30.06.2000	Index, %
Profit from investment services	14,424	15,614	108.2
Miscellaneous profit/loss	-409	-824	201.5
Costs of operation	9,718	10,187	104.8
Operating profit/loss	4,297	4,603	107.1
Profit/loss on financial operations	812	409	50.3
Ordinary trading profit/loss	5,109	5,011	98.1
Extraordinary profit/loss	-177	-338	190.9
Pre-tax profit/loss	4,932	4,674	94.8
ROA	6.3%	5.8%	92.3
ROE	20.4%	15.8%	77.6

Chart III.8 Distribution of profits from investment services by type of institution

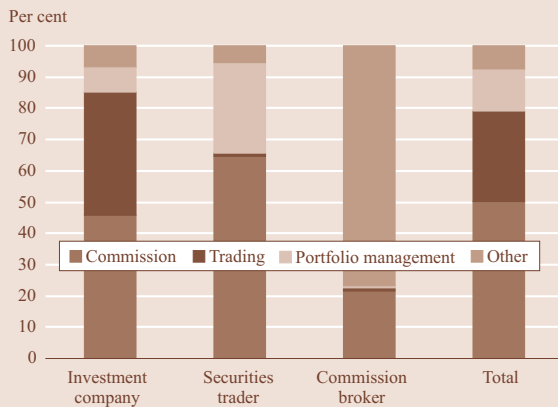
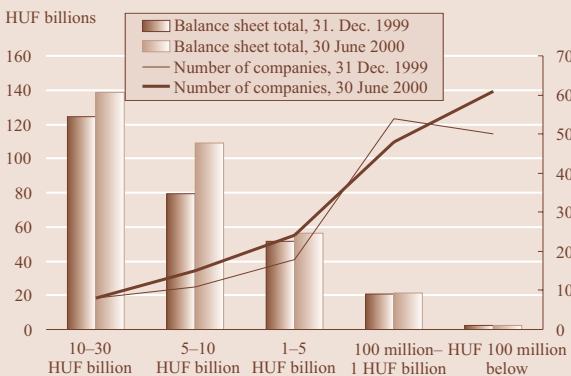
Chart III.9 Balance sheet total and number of financial enterprises by size⁶

Table III.3 Share of financial enterprises backed by banks

	Balance sheet total				Balance sheet profit figure			
	30.06.1999		30.06.2000		30.06.1999		30.06.2000	
	HUF bil-lions	%	HUF bil-lions	%	HUF bil-lions	%	HUF bil-lions	%
Held by banks	102	42	198	55	1.0	36	2.5	24
Held by bank/state	58	24	65	18	-0.5	-18	3.3	32
Together	160	66	263	73	0.5	18	5.8	56
Financial enter-prises total	281	100	362	100	2.5	100	10.5	100

The pre-tax profits of investment service providers amounted to HUF 4.7 billion on June 30, 2000, some 5.2% less than that measured during the same period of the preceding year (Table III.2). Of the combined profit figure, investment companies booked HUF 3.8 billion, securities traders HUF 0.8 billion and commission brokers HUF 24 million. At the end of June 2000, the combined ROA of investment firms was 5.8%, while their ROE was 15.8%. Both of these figures are less favourable than the 6.3% and 20.4%, respectively, measured over the same period of 1999,⁵ but they well exceed the end-1999 figures.

In the first half of 2000, with one exception, all of the companies made a profit on investment services, for a sum total of HUF 15.6 billion. Some 50% of the profit originated from commission activities, 30% from trading and 13% from portfolio management (see Chart III.8). It is a warning sign that companies set aside provisions in relation to their investment service activities only to a small extent in the first half of 2000.

The costs of operations amounted HUF 10.2 billion at the end of the half-year under review, rising by no more than 4.8% relative to the previous year. In evaluating this, however, it should be taken into account that several loss-making companies have terminated their operation in the meantime.

The growing miscellaneous and extraordinary loss figures allow for the conclusion that, at the overall sector level, the individual losses arising from the losses made in the portfolios are considerable in relation to which provisions have either not been allocated or, if so, not to a sufficient extent.

It is expected that the profitability of the sector will decline further by the end of the year, as their profits arise largely from their activities as commission brokers and, in the second half of the year, market trading dropped dramatically and some of the costs are settled only at the end of the year.

Financial enterprises

According to the Act on Credit Institutions, financial enterprises may pursue only financial activities from December 31, 1998. The number of financial enterprises (which previously amounted to several hundred) fell significantly in the course of 1997, only to expand dynamically again from 1998. On June 30, 2000, there were 164 financial enterprises on record with the Hungarian Financial Supervisory Authority (see Chart III.9). Most of the new companies were founded in the first half of 1999. Since then, the number of participants in the sector has been growing continuously, although at a slower pace. The financial services provided by most financial enterprises continue to be the extension of loans and financial leasing.

The role of banks and companies established to implement various economic policy goals continues to be decisive among the shareholders of financial enterprises (see Table III.3).

The balance sheet total of the sector grew dynamically in the period under review: it increased by 29% relative to the first half

⁵ As investment firms only began to report their profit and loss account data in 1999, last year's data may contain some inaccuracies.

⁶ Net of Reorg Apport Rt.

1999, and by 15% relative to the end of 1999. The driving force behind this growth was the expansion in claims against clients, characteristically financial leasing. On the liability side, growth was financed fundamentally by credit and partly by capital increases. There is, however, a maturity risk in the sense that most of their claims are long-term, while a major portion of their liabilities are short-term.

The sector's assets (see Chart III.10) are largely composed of short- and long-term claims against companies. Leasing constitutes the lion's share of placements, the stock of which expanded substantially relative to the base period. Securities did not change to any considerable extent.

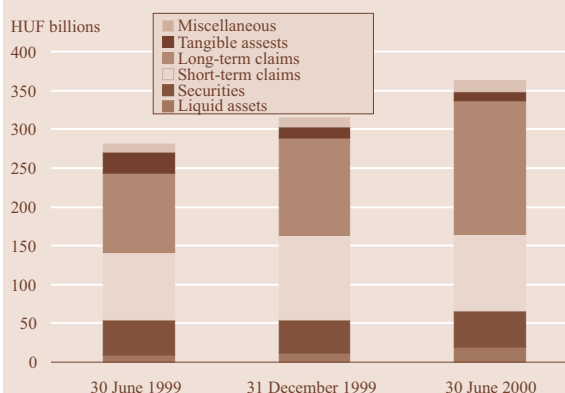
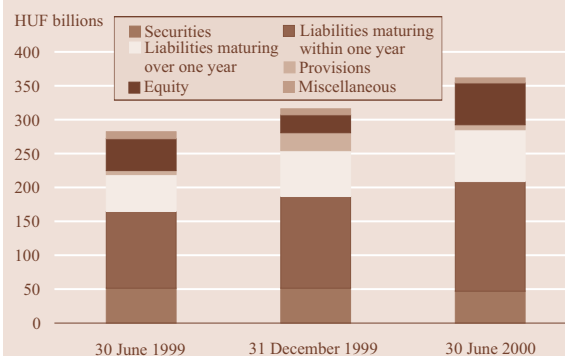
The majority of the liabilities of the sector consist of loans received and other liabilities of which those maturing within one year represent a growing share (see Chart III.11). The role of financing by banks has been decisive and is increasing. The amount of liabilities arising from securities issued declined, with their share falling considerably within the rapidly growing balance sheet total. All this points to the fact that the sector relies heavily on banks, and its development is largely determined by the willingness of credit institutions to provide financing. This may carry severe risk when financial enterprises held by banks are allowed to grow out of credits extended by the parent bank without the constraint of the more stringent lending rules applicable to the latter.

The decline in the share of credits from the shareholder credit institutions may indicate that the banks have already financed their financial enterprises up to the limit of large credits or to an extent approaching that (see Table III.4). For additional growth, even the subsidiaries of banks may need other funding from credit institutions, and foreign parent banks directly finance the financial enterprises they hold.

The amount of equity showed heavy fluctuations at the three points in time, moving opposite to the stock of provisions on the liability side. The reason for this is that the claims management company held by the state set aside a larger amount of provisions at the end of the year, as a result of which it incurred a loss and its equity became negative, which also had a substantial impact on the sector total data.

Over the first six months of 2000, the equity of financial enterprises increased in a balanced manner, its main sources being the profit reserve and the balance sheet profit (see Table III.5). There are substantial differences between enterprises in terms of capital strength. While there were two companies in the middle of 1999 whose equity was in the red, at the end of 1999, and in the first half of 2000, there were four such companies. The amount of equity dropped below the level of the minimum HUF 20 million registered capital of eight companies in mid-1999, of three companies at the end of that year, and of 22 companies at the end of June 2000.

Total provisions can still be described as minimal and do not reflect the actual risks implied in the portfolio. As the rating rules prescribed for banks are not applicable to financial enterprises, they may also have placements with companies which would not be granted a credit by banks owing to their financial figures. This may be particularly important in respect of financial enterprises held by banks, because in this case, the loss incurred the subsidiary will ultimately weaken the position of the bank. This risk,

Chart III.10 Asset structure of financial enterprises

Chart III.11 Composition of the liabilities of financial enterprises

Table III.4 Liabilities of financial enterprises

	30.06.1999		31.12.1999		30.06.2000	
	HUF bil- lions	distribu- tion, %	HUF bil- lions	distribu- tion, %	HUF bil- lions	distribu- tion, %
Total liabilities	167	100	202	100	239	100
Credit institutions	107	64	144	71	173	72
from owner credit institutions	51	48	70	35	70	29
Clients	14	8	23	11	15	6
Other liabilities	46	28	35	17	51	21
Securities	52	31	52	26	47	20

Table III.5 Equity of financial enterprises*

	30.06.1999		31.12.1999		30.06.2000	
	HUF mil- lions	distribu- tion, %	HUF mil- lions	distribu- tion, %	HUF mil- lions	distribu- tion, %
Equity	35,316	100	34,920	100	48,495	100
Registered capital	17,563	50	15,018	43	19,096	39
Capital reserve	9,704	27	9,663	27	10,142	21
Profit reserve	4,778	14	2,971	9	10,953	23
Revaluation reserve	659	1	678	2	693	1
General reserve	1	0	2	0	3	0
Balance sheet profit	2,707	8	6,587	19	7,608	16

* Net of Reorg-Apport and Hitelgarancia Rt.

Table III.6 Profit and loss statement of financial enterprises*

	30.06.1999		31.12.1999		30.06.2000	
	HUF millions	distribution, %	HUF millions	distribution, %	HUF millions	distribution, %
Net interest income	3,303	56	10,278	59	9,025	62
Profit/loss on other financial and investment services	2,550	44	7 140	41	5 460	38
Gross profit/loss on financial and investment services	5,853	100	17,418	100	14,485	100
Costs of financial and investment services	4,275	73	12,368	71	7,056	49
Profit/loss on financial and investment services	1,578	27	5,050	29	7,429	51
Profit/loss on non-financial and investment services	1,703	29	4,028	23	1 448	10
Pre-tax profit	3,229	55	9,112	52	8,658	60
Balance sheet profit	2,937	50	6,587	38	7,775	54

* Net of Reorg Apport and Hitelgarancia Rt.

however, will remain hidden in the books of the bank until that loss is realised.

The following statements can be made on the basis of the profit and loss statements of the three periods (see Table III.6).⁷

In the first half of 2000, financial enterprises recorded profits which nearly reached the profit figure for the entire preceding year and which also greatly exceeded the figure for the base period. Both net interest income and profits from other financial and investment services expanded dynamically: the number of companies rose, and the large number of companies founded in the first half 1999 became genuinely active in the second half of that year and in the first half of 2000.

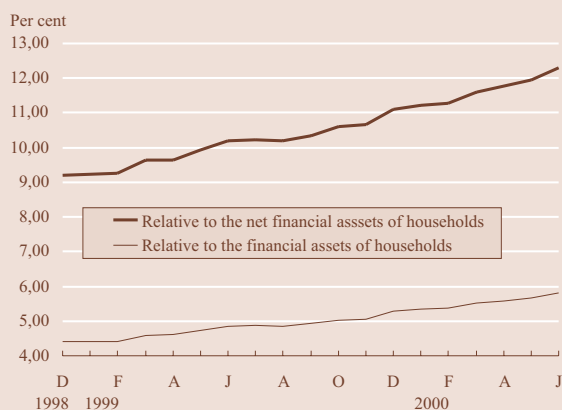
The increase in costs – although it was exceedingly dynamic at 65% – fell short of the expansion in gross profits on financial and investment services. The balance of forming and releasing provisions was not significant, ranging between, HUF –2 and +1 billion.

According to the December 31, 1999 data of financial enterprises, the value of their ROA was 3.5%, their ROE 27%, both of which were much better than the end-of-last-year figures of the banking sector. The practically total absence of provisioning played a major role in the development of such favourable profitability ratios. By projecting the profit data of the first half of 2000 to the entire year, we would get such unrealistically high values (ROA in excess of 6% and ROE in excess of 40%), on the basis of which strong doubts arise concerning the truth and fairness of the profit data disclosed at the half-year mark. It is highly probable that the profit growth rate will slack off in the course of the second half of the year.

Insurance companies

At end-June 2000, 5.8% of the financial assets of households were invested in life insurance premium reserves, which represents a fair increase of 0.5 percentage points relative to the beginning of the year (see III.12). An increasing portion of household savings has been flowing into unit-linked life insurance. To a great extent, the very rapid growth in the sector is based on regulatory and tax arbitrage. A comparison of the rules applicable to investment funds and the investment-linked life insurance facilities of insurers reveals that insurance companies enjoy substantial advantages relative to investment funds, even though the forms of savings they offer are extremely similar to those of the investment funds. The market of investment units is stringently regulated compared to that of unit-linked asset funds – the Act on Investment Funds does not apply to the latter, while the Act on Insurance does not contain regulations concerning disclosure obligations,⁸ the mandatory portfolio diversification, the choice of an independent depository, etc. The tax preference available for life insurance constitutes an additional competitive

Chart III.12 Share of life insurance premium reserve



⁷ The data for June 30, 2000 and June 30, 1999 can be compared only to a limited extent, as we only have the reports of three quarters of the companies in the base period.

⁸ Pursuant to the amendment of the Act on Insurance, the possibility to obtain daily information on the placement and value of the investments of unit-linked life insurance arrangements must be guaranteed from January 1, 2001.

advantage compared to the limited tax credit available to investment funds.

In the first half of 2000, no new insurance companies were founded and there were still 22 insurance companies present in the market.

The HUF 648 billion balance sheet total of insurance companies exceeded the level at end-1999 by 15.9% at the end of June 2000. Growth in equity was even more dynamic at 23.3%. As insurance companies do not provide data on the development of their profits in the course of the year, we do not have accurate information on changes in their profitability. The strong increase in equity indicates stable profits and adequate profitability at the system level. Over the first six months of the year, the equity of six smaller companies decreased slightly from which we may conclude that some of the insurance companies have been struggling with profitability problems.

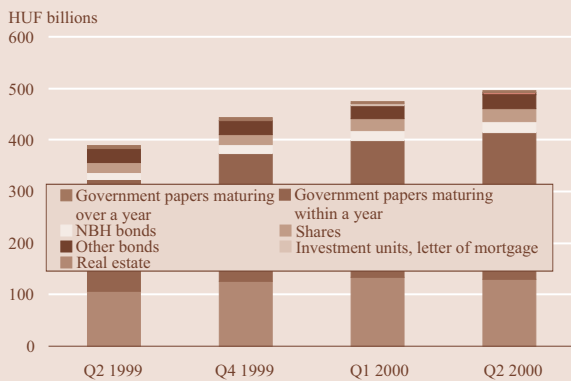
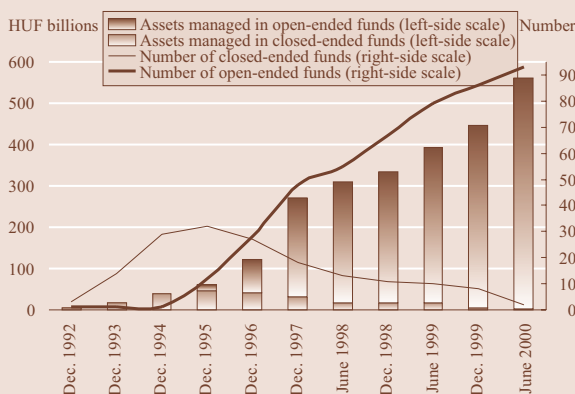
At the end of June 2000, insurance companies had a total of 12 million contracts, which is approximately the same as at the beginning of the year. This stagnation arose from the result of different developments in the two branches of insurance: the number of contracts decreased in the life business, while it rose somewhat in the non-life business. In contrast to the number of contracts, the gross premium written increased at a higher rate in life insurance than in non-life in the course of the period under study which, taking into account the large number of repurchased contracts, allows the conclusion that clients replaced their old policies with more up-to-date ones with higher premiums.

In the first half of 2000, insurance companies recorded HUF 187.1 billion in premium revenue, showing a real increase of close to 19.6%⁹ relative to the same period in 1999. The reinsurers' share of the premium was HUF 36.7 billion, pointing towards the growing role of reinsurance. The life insurance branch registered HUF 84 billion in premium revenue over the first half of 2000, representing 45% of the total premium revenue. The premium revenue booked by the non-life insurance branch (HUF 103 billion) rose by 5.5% in real terms over the period under study. Although a gradual, slow slackening in concentration has characterised the sector, nevertheless, three companies hold 76% of this segment of the market.

In the first half of 2000, insurance companies paid a total of HUF 71.6 billion on claims and other services, indicating real growth of 13.3% (6.3% lower than the growth in premium revenue) relative to the same period of 1999. Life insurance had a share of 25%, while the non-life business accounted for 75% of total payments on claims and other services. An examination of the changes in the claims ratios¹⁰ of the two business lines reveals that there was a substantial deterioration in the ratio of the life business relative to the same period of 1999. This is attributable to the fact that the life insurance contracts concluded upon the establishment of the Hungarian life insurance market – at the time for a maturity largely more than 10 years – are beginning to mature these days. In contrast, the claims ratio in the non-life business shows a slight improvement, although it is still very high in the case of the Casco and vehicle liability insurance, represent-

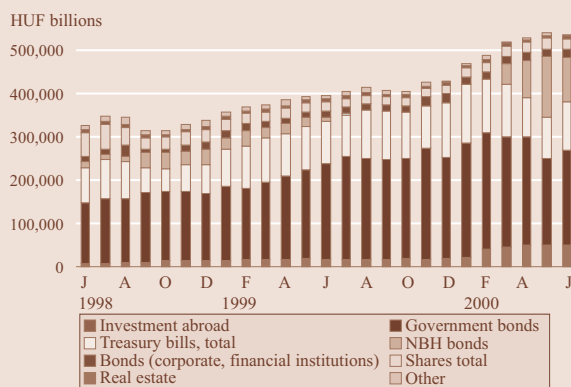
⁹ The consumer price index relative to the same period of the preceding year was 9.5%.

¹⁰ Claims ratio = payment on claims/premium revenue x 100.

Chart III.13 Portfolio composition of technical reserves and solvency margin of insurance companies

Chart III.14 Number and assets of investment funds

Table III.7 Investment units held by main ownership categories

	Per cent				
	Distribution of net asset value				
	1999			2000	
	March	June	December	March	June
Credit institutions	2.0	1.5	1.8	1.8	1.8
Other legal entities	17.8	16.4	14.8	14.8	14.4
Households	78.3	80.1	81.6	82.0	82.4
Non-residents	2.0	1.9	1.8	1.4	1.4
Total	100.0	100.0	100.0	100.0	100.0

Source: NBH Monthly Report

Chart III.15 Portfolio of the investment funds


ing 57% of the premium revenue of this branch (63.1% and 67.2%, respectively).

At the end of the six months under review, insurance companies held a total of HUF 496.1 billion in technical reserves and investments serving as coverage for the solvency margin. This was 12.6% higher than the figure early in the year.

The investment policies of insurance companies are still characterised by an attempt to ensure the highest degree of security: they place 86% of their investments in government securities, which is substantially higher than the minimum 30% government security holding prescribed by law (see Chart III.13). With respect to securities issued by the state, the tendency of papers maturing over one year gaining ground and those maturing in less than one year declining continued. With the issue of NBH bonds in 2000, these instruments appeared in the portfolios of insurance companies (by the end of the period, they represented a share of 2.7%). The share of equities issued by business organisations also increased slightly. Companies show an increasing willingness to buy letters of mortgage and the units of open-ended securities funds, although these represent still a very small portion of their investment portfolios.

Investment funds

A dynamic increase in the number of investment funds was observed until the end of 1999, due exclusively to growing number of open-ended funds. Over the first six months of 2000, the number of investment funds dropped by two, as a consequence of the further decrease in the number of closed-ended funds (see Chart III.14).

At the end of the first half of 2000, there were 95 investment funds in operation in the money and capital markets, of which the number of closed-ended funds was no more than two. Over the past two years, the assets of the funds rose vigorously, and by the end of June 2000 amounted to as much as HUF 560 billion. The net asset value increased by 25.3%, that is, HUF 123.2 billion over the first half of 2000, 80% of which is due to change in volumes. Growth in net asset value was not evenly distributed over the six months – the decisive role in the favourable price changes of the first quarter was played by the decline in government securities yields. The low asset value growth in the second quarter was the result of the rise in government paper yields and the nosedive in share prices. In spite of the less favourable figures for the second quarter, the activities of the investment funds can be described as good over the half-year.

The distribution of investment unit holders by main ownership categories does not show any significant volatility (see Table III.7), but the growth in the holdings of households seems to be a trend: they bought over 80% of the units accounting for 4.3% of households' net assets at the end of 1998 – the same figure for December 1999 was 5.1%, and 6.3% for the end of June 2000.

Domestic investments account for the majority of fund investments: the share of direct investments abroad did not reach 5% in the portfolio in 1999, but this share was at around 8–9% after March 2000 (see Chart III.15). Low-risk assets, government bonds, discount treasury bills and NBH bonds constitute the majority of domestic investments, their share in domestic invest-

ments at the end of the first half of 2000 corresponded to the end-1999 value at 85%.

The share of equities declined considerably within the domestic portfolio: while in June 1998 they still accounted for a share of 18%, currently their share in assets is no more than 5% (primarily as a result of the events in the stock market in August–September 1998, see Table III.8). Over the first six months of 2000, there was a substantial rearrangement among domestic investments in favour of the central bank bond introduced by the NBH from March 20. Their stock reached HUF 102 billion and their share within the domestic portfolio 20% at the end of June 2000.

Investment funds are categorised on the basis of the nature of the fund, but their portfolios frequently differ from that what would be consistent with the type of the fund. Characteristically, international funds also have domestic investments (at the end of June 2000, 37% of the total investments of international funds were domestic), and there is a bond fund which holds foreign securities in substantial quantities.

According to a breakdown by types, a growing dominance in bond funds can be observed (see Chart III.16). Over the past two years, money market funds gained some important ground primarily to the debit of mixed funds. Nose-diving share prices in the first half 2000 and the decline in bond yields over the first quarter (the increase in their prices) channelled investors towards the lower-yield bond funds (whose yields still exceeded the return on bank deposits), while the increase in the share of stock funds indicates that there are more and more investors who believe that there is major growth potential in stock funds with the current price level. The loss of ground by mixed funds indicates that investors have marked expectations concerning changes in equity or bond prices. They tend to delegate the choice between the two markets to experts less and less.

The majority of investment fund managers are held by banks: there are only a few fund managers among whose owners there are no credit institutions. The market is predominated by fund managers whose majority shareholders (directly or indirectly) are banks. Their market share in terms of the assets managed is between 97%. The banks predominating the market have increasingly implemented the strategy of having a fund manager offering several types of open-ended funds with a choice, whereby savers can choose the investment unit that corresponds to their willingness to assume risk.

A change in regulations has affected foreign investments: the provisions of the Act on Investment Funds governing immediate solvency, net asset value calculation, disclosure and investment were also extended to domestic trading in the units of foreign funds.

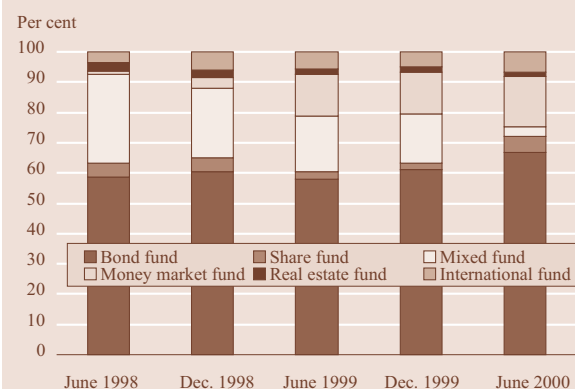
Regarded from the aspect of profitability, investments had a common characteristic over the past year in the sense that their yields regularly fell short of benchmark yields, but, apart from a few exceptions, the yields' standard deviation was lower than that of the reference yield, hence investment funds have been able to exploit the advantages arising from diversification; the volatility in their profitability has been lower than the ratio characterising the market.

Depending on the length of the period examined, the profitability of the fund types shows a different picture: the net asset value of the higher-risk domestic share funds decreased over a

Table III.8 Composition of the domestic assets of investment funds

	Per cent			
	Dec. 1998	June 1999	Dec. 1999	June 2000
Cash and bank accounts	1	1	1	1
Time deposits	2	1	3	4
Government bonds	47	58	55	43
Treasury bills total	21	26	29	22
NBH bonds	11	3	0	20
Bonds (corporate, financial institution)	5	4	5	4
Shares total	9	6	5	5
Real estate	2	2	1	1
Other	2	0	1	1
Total	100	100	100	100

Chart III.16 Market shares of the types of investment funds



quarter, but over a time horizon of a half-year or one year, their yields still characteristically exceeded those of the other types. Over a longer term, however (2–3 years), the yields of the money market and bond funds were higher than those of the equity funds in spite of their lower risk.

Among the foreign share funds, we may find funds with outstanding profitability as well as low profitability depending on the region and the sector in which they invested investors' funds. The yields of bond and money market funds tend to be more balanced in the mid-term thanks to the fact that the spread of the benchmark yields representing the market is also substantially lower than the ratio characterising the equities market.

Pension funds

The assets managed by the pension fund sector exceeded HUF 330.4 billion by the end of the period under study, a rise of 32.2% since the end of 1999. Nearly half of the economically active population chose to enter the private pension fund scheme and more than a quarter of them are also members of voluntary funds (see Table III.9).

It is unfavourable for the members that the tax preferences on payments declined relative to the preceding year.

By amending the acts on private pension funds, bankruptcy and the tax laws, the *Ministry of Finance* reinforced the guarantees of payments by the private funds. Accordingly, from the first day of January 2002, all pension funds must shift to the daily market valuation of their assets. Currently, this and the performance of the manager of their assets are measured on a quarterly basis, thus the supervisory authority obtains detailed information only then. Every private pension fund must draw up its investment policy and asset management guidelines containing mandatory elements for the first time by March 31, 2001. The amendments make it possible to obtain up-to-date information on changes in portfolio composition, the implementation of the investment policy and the performance of the funds in the future. Private pension funds will also have to develop reference portfolios and inform the public regarding these. According to another rule, a pension fund may only publish the average yield calculated on the basis of an entire year. The provisions concerning the functions and operation of the Guarantee Fund of Pension Funds (PGA) were also clarified.

Members of private pension funds will have another two years to consider whether they wish to keep their savings in the private pension scheme or whether they would return to the mandatory social security pension scheme. The reason for this is that the rules concerning the contribution rates for the pension funds originally designed have been amended. Until 2003, a member in a private pension fund must pay a 6% membership fee to the fund and a 1% contribution to the state-run pension fund. Originally, the membership fee should have risen by 1% a year for a period of 3 years, reaching thereby the mandatory maximum, which the employer or the member could supplement to 10%.

Private pension funds

At the end of the first half of 2000, there were 25 private pension funds with operating licenses which were actually in operation. Of the 25 funds, 12 are backed by banks or insurance companies, eight were founded by employers and five other funds were set up by mixed groups (voluntary fund and/or several smaller employers).

While in 1999 the activities of private pension funds were characterised by a spectacular increase in the number of members, from the fourth quarter 1999, the growth rate of the membership slowed (see Table III.10). The reason for this was the closing of the period open for voluntary entry, thus, since August

Table III.9 Assets and number of members of voluntary and private pension funds

	Voluntary funds		Private funds		Total	
	1999, total	1st half 2000, total	1999, total	1st half 2000, total	1999, total	1st half 2000, total
Number of members (in thousand)	1,102.0	1,153.1	2,064.1	2,093.3	3,166.1	3,246.4
Assets (at book value, HUF billion)	160.1	196.8	89.9	133.6	250.0	330.4

31, 1999, the scheme increases only by the number of people starting their careers. In spite of the modest increase in the number of members, their assets rose significantly by 48.7% relative to the end of 1999; with 83% of this growth attributable to membership fee revenue owing to the rise in the per capita membership fee revenue.

The age group of the 20–40 year olds accounts for nearly 80% of fund members. Since the period when only those could enter the private pension funds who just entered their careers, the thrust has shifted from the 30–39 year olds, and currently the average age of pension fund members is 32.

It was favourable that per capita membership fee revenue rose relative to 1999, but it still does not make up more than 63% of that calculated on the basis of the average earnings at a national level (in 1999, this figure was only 45%, see Table III.11).

Over the first six months of 2000, net income from investment activity amounted to HUF 3.6 billion with the average return on assets at no more than 6.5%. The funds do not pay benefits as of yet, thus benefit payment expenditure does not appear for the time being. Over the first six months of 2000, private pension funds charged close to HUF 2.1 billion as costs of operation corresponding to 5.4% of the membership fee revenue.

By the end of the first half of 2000, the assets of private pension funds exceeded HUF 133.6 billion, nearly one-and-a-half times the figure for in December 1999. A conservative investment policy continues to be the norm, even though the share of equities and investment units rose somewhat over these six months (see Table III.12). In spite of the relatively low ratio of equities, the unfavourable movement of stock exchange prices had a heavy impact on the value of their investments, while the rise in the prices of government securities in the first quarter was substantially reduced by the nosedive in share prices in the second quarter.

Voluntary pension funds

Of the voluntary pension and health funds, it is still the pension funds that can boast of 90% of the membership and over 98% of the assets of the funds – thus they basically determine the tendencies prevailing in the voluntary fund sector.

By the end of the first half 2000, the number of actually operating voluntary pension funds decreased to 125. In the course of those six months, operation of 20 of the 145 funds functioning at end-1999 was terminated by takeover, merger, winding up or liquidation.

By the end of the period under study, the total number of members in voluntary pension funds exceeded 1,040,000, up some 3% on the end-1999 figure. Relative to the same period of 1999, the growth in numbers was 8.7% (84,000), while membership fee revenue decreased by 6.4% (see Table III.13).

Payments to voluntary funds basically originate from three sources: membership fees paid by fund members, employers' contributions regularly paid and donations and subsidies provided by employers and supporters. The decisive portion of regular membership fee revenue (73.5% in the first half of 2000) is still paid by employers, even though their share declined by a few percentage points over the past year. Ad hoc donations by employers decreased even in nominal terms relative to the same

Table III.10 Key data on private pension funds

Description	1st half 1999	1999 total	1st half 2000
Number of members (in thousand)	1,551.0	2,064.1	2,093.3
Number of members (in thousand)	24.6	52.2	39.0
Costs of operation (HUF billion)	1.9	4.2	2.1
Yield (HUF billion)	1.7	8.5	3.6
Assets (at book value) (HUF billion)	54.2	89.9	133.6

Table III.11 Efficiency and profitability indexes of private pension funds

Description	1st half 1999	1999 total	1st half 1999
Per capita assets (HUF thou./head)	34.9	43.5	63.8
Per capita membership fee revenue (HUF thou./head/month)	2.6	2.1	3.1
Return on assets (%)*	8.4	7.3	6.5
Costs of operation/membership fee revenue (%)*	7.6	8.1	5.4

* Projected to the annual level calculating with the average asset value.

Table III.12 Composition of the investments of private pension funds

Form of investments	Per cent	
	End of 1999	End of 1st half 2000
Bank accounts and cash	3.2	0.9
Bank deposit	0.5	0.4
Hungarian government securities	84.0	81.1
Shares	9.8	12.5
Bonds	1.6	1.3
Investment units	0.5	2.8
Other	0.4	1.0
Total	100.0	100.0

Table III.13 Characteristic data on voluntary pension funds

Description	HUF billions		
	1st half 1999	1999 total	1st half 2000
Number of members (in thousand)	959.8	1,007.4	1,043.6
Membership fee-type revenue	25.0	54.4	23.4
of this: membership fee paid by members	5.4	14.2	6.2
Employers' contributions to the membership fees	13.1	28.5	13.7
Costs of operation	1.4	2.9	1.6
Yield	9.4	20.7	7.9
Assets (at book value)	119.5	154.7	193.0

Table III. 14 Efficiency and profitability indexes of the voluntary pension funds

Description	1st half 1999	1999 total	1st half 2000
Per capita assets (HUF thou./head)	124.5	153.6	185.0
Per capita membership fee revenue (HUF thou./head/month)	4.3	4.5	3.7
Return on assets (%)*	17.0	15.1	9.1
Operating costs/assets (%)*	5.8	5.3	6.5

* Annualised, calculated with average asset values.

period in 1999, thus overall, per capita membership fee revenue was lower than in 1999.

Voluntary funds use a higher percentage of membership fee revenue (6.6%) for costs of operation than private pension funds. It is a warning sign that the amount earmarked for this purpose did not provide full coverage for the actual costs of operation in the first half of 2000 (in contrast to 1999 and earlier years, see Table III.14).

Over the period under study, voluntary pension funds booked net income of HUF 7.9 billion from investment activities. The return on assets (9.1%) declined considerably in the first half of 2000 relative to the same period of the preceding year, but it was still higher than the average yield achieved by private pension funds.

Voluntary pension funds paid pensions amounting to HUF 4.1 billion in the course of the half-year. The value of the benefits paid expressed as a percentage of their assets reached 2%. 95% of the total pension benefits consisted of lump sum payments.

By the end of the first half of 2000, the assets of the voluntary pension funds, having grown by 38% since the end of 1999, exceeded HUF 193 billion (see Table III.15). A slight shift in the structure of the assets of voluntary pension funds was observed: the shares of bank deposits, shares and investments units rose, while that of government securities declined, yet the latter still accounted for close to 70% at the end of the first half of 2000.

Table III. 15 Composition of the investments of voluntary pension funds

Form of investment	Per cent	
	End of 1999	End of 1st half 2000
Bank accounts and cash	2.8	2.3
Bank deposit	1.6	6.5
Hungarian government securities	77.8	69.7
Shares	10.8	13.5
Bonds	3.4	2.1
Investment units, other	3.6	5.9
Total	100.0	100.0

Risks characterising the operation of non-bank financial intermediaries

Following a review of the position of the individual types of institutions, we have attempted to summarise the extent to which the different types of non-bank financial intermediaries are exposed to various kinds of risk based on the nature of their operations (see Table III.16).

Financial enterprises are most exposed to lending risk; they have (credit) portfolios similar to banks, but the provisioning rules applicable to them are different. The exposure of investment firms to lending risk is also not negligible, related primarily to the rise in financing client orders. Through licensing insurance companies to pursue mortgage lending activities, lending risk may appear also in this sector in the future, but its extent cannot be high even in the future owing to the stringent constraints linked to the solvency margin.

By the nature of their operations, investment firms and investment funds are the companies the most exposed to market risk.


Table III. 16 Risks characterising the operation of non-bank financial intermediaries

Risks		Institution type				
		Investment firms	Financial enterprises	Insurance companies	Investment funds	Pension funds
Lending		Medium	High	Not characteristic	Not characteristic	Not characteristic
Market	Interest rate	Medium	n.a.	Medium	High	Medium
	Foreign exchange	Medium	Medium	Low	Low	Low
	Share	High	Low	Low	Medium	Medium
Operating		High	Medium	Low	Low	High
Regulatory		High	High	Low	Low	Medium

In the case of investment funds, market risk can be deemed to be medium on the whole, because, in spite of the stringent requirements on the portfolio and the conservative investment policy, the short-term price movements of the equities portfolio may have a substantial impact on those wishing to invest. We shall have information on the exposure of investment firms to actual market risk after the introduction of the capital requirement linked to the trading book after April 1, 2001. With regard to market risks, the share risk to which the portfolio of the pension funds is exposed deserves mentioning in spite of the fact that the weight of shares in their portfolios is not high, nevertheless, it has a rising tendency. In the case of insurance companies, interest rate risk is the market risk that has some role to play owing to the exceedingly conservative portfolio but, should unit-linked insurance spread further, we may expect an increase in market risks.

Operating risk stems basically from the deficiencies in the recording and IT systems and most frequently appears in the operation of investment firms and pension funds. The new, exceedingly detailed reporting requirement vis-à-vis the supervisory authority for investment firms will obviously force them to improve their recording systems. The more intensive and effective supervisory activity following the establishment of the new supervisory agency created with the takeover of pension fund supervision may substantially facilitate the future reduction in the operating risk of pension funds.

In 2001, the risk of changes in laws or regulations primarily influences two types of institutions: investment firms and financial enterprises. The introduction of the trading book, the increase in the capital requirements for financial enterprises and the settlement of interest (rendering it conditional) and value adjustment similar to credit institutions may lead to the appearance of risks (losses) which had not previously been recognised.



IV. Studies

STRESS TEST. ASSESSING MARKET AND CREDIT RISKS FROM THE VIEWPOINT OF THE STABILITY OF THE BANKING SECTOR

1 Introduction

The stormy international financial traumas of the past decade have raised serious questions about the stability of financial systems and their ability to resist crises. These crises threw light not only on the shortcomings of banks' risk management, but also on the weaknesses in market infrastructure, regulation and supervisory activity. International institutions, central banks, regulatory authorities and industrial groups rallied together to develop standards (for the conduct of risk management, regulation and monetary policy), compliance with which could enhance the resistance of financial systems to similar crises.

These events, particularly the 1998 Russian crisis, have drawn the attention of the Hungarian authorities even more to issues concerning the stability of the financial system. In this study we report about stress tests¹ we conducted for the first time. The findings of these tests may contribute to a better assessment of the stability of the Hungarian financial sector. We examine what loss of capital (reduction in the market value of the portfolio) would be caused by extreme

changes in certain risk factors in the banking sector. Under various extreme scenarios, we analyse changes in two types of risk exposure: market risk and credit risk. The analysis is based on the audited data of individual bank portfolios at the end of 1999. One of the major shortcomings of the analysis is the lack of consolidated data. The risk exposure of bank groups could substantially exceed that derived from individual data – thus, for instance, a number of large banks “transferred” their forex risks to their subsidiaries at the time of the 1998 crisis.²

A number of problems could be raised in relation to the methods applied. Duration is applied to re-pricing gaps; the time series used for regression are short; the tests give a snapshot at one given point of time, which may change quickly if the banks' re-pricing balance sheet changes; we calculated with only one foreign currency, etc. The limitations of the analysis arise from the nature of the problem under study and data problems. In the course of our analysis, we attempt to consider the impact of the assumptions and simplifications used and to point out in what direction they distort the results. Understanding the limitations of the analysis could help the proper interpretation of the results of the tests. We have to emphasise that this framework of analysis can by no means be regarded as final. There is a need to improve the methods applied, to extend the range of scenarios studied and to perform further analyses required for adding additional details to the results.

The study is organised as follows: the second chapter gives a brief summary of possible applications of stress tests. The third chapter provides an overview of the measurement of market and credit risks and their interrelations. The fourth chapter describes the methodology applied, the data and the scenarios, while the fifth

¹ In developing the methodology and designing the scenarios, we greatly relied on similar tests performed under the Financial Stability Assessment Program (FSAP) carried out by the IMF and the World Bank.

² See the result of the single survey of data on banking groups performed after the crisis (Gubó-Rosta, 1999).

chapter assesses the results obtained. In the sixth chapter, we investigate the impact of a few simplifications, assumptions not yet discussed. After drawing the final conclusions, we outline the further possible extension of the analysis.

2 Stress tests and their application

Stress tests

Stress tests are used to assess the potential impact of extreme but plausible events. In the current case, we examine the impact of changes in certain risk factors (interest rate, exchange rate and quality of credit portfolio) on the market values of the assets and liabilities of the banks, and through that on their capital position.

There are a number of **types** of stress tests: sensitivity analysis (which quantifies the impact of changes in a single factor), scenario analysis (which examines the impact of simultaneous changes in multiple factors), maximum loss estimation and the extreme value theory (EVT – which examines the characteristics of the tail of the distribution functions). The most frequently used method is scenario analysis. This is what we apply as well.

When specifying stress tests, a decision has to be made about the **types of risk** which they address – we extend the analysis to market and credit risk – and whether individual exposures should be examined separately or simultaneously in an integrated framework. We attempt to do both. The choice between **models** applied to quantify risk exposure is influenced by the quality of the available information as well as the objective of the analysis.

To identify individual **shocks**, it is necessary to select the relevant variables (interest rate, exchange rate, etc.) and a decision has to be made whether we should analyse the effects of changes in risk factors or also the impact of changes in their volatility and the correlation between them. We focus on the impact of changes in levels.

Depending on the type of **scenario** on which the analysis is based, we may distinguish historical and hypothetical scenarios. One of the

major issues of scenario analysis is to what extent the given scenarios are relevant. First, historical examples are not necessarily available, and second, crises rarely repeat themselves. This also raises serious questions in the case of Hungary, where the shortness of the available time series and, in some cases also, the absence of observed historical crises makes the identification of relevant shocks particularly difficult.³ Another shortcoming frequently mentioned is that these tests (apart from EVT based on statistical models) do not assign probability to potential losses.

The validity of the conclusions drawn from the results of stress tests greatly depends on the above choices we have to make. When, for instance, the model used for measuring risk is ill-suited or the individual shocks are inappropriately specified, the results obtained will not be reliable. The fact that at times of major price changes, historically observed correlations and the volatility of individual variables tend to change, also gives rise to a number of methodological problems.

Application of stress tests by banks

Stress tests have an important role in the risk management of **individual banks**. The various VAR models – which give the most accurate risk estimates among the methods known to date – applied to the measurement of market and credit risk, assume normal market conditions. Hence VAR is not suitable for measuring exposure to extreme events. These are events that occur very rarely, hence they cannot be captured by using VAR models, which are based on historical estimates. Because of this, stress tests are an important supplement to the VAR models.⁴ The Basle Capital Accord allows the use of internal models to calculate capital requirement (against market risk) on the condition that stringent stress tests are conducted regularly. This, however, is less

³ There is no observable historical example of an interest rate shock. The devaluation effected as part of the Bokros package can be regarded as an exchange rate shock. We do have an observation for credit shock; it, however, was an event linked to the transition and stabilisation, hence it is unlikely ever to be repeated in that form.

⁴ Stress tests are suitable for the identification of events and impacts, which are capable of exerting substantial influence on the risk exposure of banks.

extensively used in the management of credit risk. According to a BIS survey (BIS [1999]), about half the banks questioned performed stress tests on occasion, but the majority did not have formal procedures developed for this. In Hungary, only a fraction of banks perform stress tests, for instance, for the management of exchange rate risk (see Szalay-Szegedi, 1999).

Aggregated stress tests

Originally, stress tests were used by institutions primarily to analyse market risks. Extreme events are also, however, of outstanding significance for the **stability of the financial system**. The objective of the stress tests performed here is not to assess the risks facing individual banks but to evaluate the capability of the financial sector to resist shocks. This different orientation also implies a modification in the usual methodology of stress tests.

First, tests are performed on individual banks, then the results obtained are “aggregated”. In this phase of the work, we are not able to take into account changes in market liquidity during crisis or the potential spill-over effects. In an ideal case, that would be the expectation set against aggregated stress tests. This requires additional analysis. That means we are still far away from being able to estimate the systemic effect of these shocks.

An alternative to the above procedure could be to aggregate the results of the stress tests performed by the banks themselves, as they are able to develop stress tests that are best suited to their own portfolios and have access to a much richer set of information. This procedure is hindered not only by the fact that domestic banks perform stress tests only rarely, but also by the diversity of available methods, which would make aggregation impossible. By developing a standard framework, highly useful information could be

obtained from such aggregated results: about financial stability for the central bank, about the risk-taking behaviour of market participants for the supervisory authorities and about the extent of the market liquidity risk for market participants.⁵

3 Market and credit risk

The risks of financial assets and portfolios are measured by the volatility of their market value. One of the most frequently applied risk measures is the variance of market value changes or the VAR (which is the maximum loss that will be incurred on a portfolio with a given confidence over a specified holding period). The market value of the portfolio of a bank may change for various reasons. Types of risk (such as market, credit, operational, liquidity or settlement risk) are distinguished accordingly. Their separation is artificial as the various risks are interrelated. Here we only address the first two types of risk.

Market risk is the risk of loss incurred on the value of market assets (portfolios) due to changes in market prices.⁶ In the case of interest-bearing assets, major market risks are the interest rate and the exchange rate risk. As the proportion of shares in the portfolios of Hungarian banks is negligible, we disregard the analysis of equity price risk.⁷

Within market risk, we may distinguish general and specific risk. Specific risk arises when the price of a given security moves more or less than the market on average, though changes in the creditworthiness of the issuer is also part of this.

Credit risk is the risk that losses will be incurred due to the default of the counterparty or (in a broader sense) due to changes in credit quality. To measure credit risk, it is necessary to estimate not only the probability of default, but also the amount of loss given default or the recovery rate. The quality of the credit may change for specific reasons, affecting only the business operations of the issuer, but also as a result of general market processes (e.g. business cycle).

⁵ About the difficulties of this see BIS (2000).

⁶ The Derivative Policy Group (1995) uses a broader definition of market risk, they define it as “the risk that the change in liquidity or market prices, rates, indexes, volatility and correlation levels gives rise to loss in the value of a given position or portfolio”.

⁷ Nor do we address commodity price risk, because even their direct impact is negligible on the portfolios of domestic banks.

There is a correlation between market and credit risk.⁸ When there is an unexpected change in the value of the assets of a company (its market risk increases), this will influence the probability of default, that is, the credit risk will also rise. Vice-versa, an unexpected change in credit risk will also have an impact on the market value of that company.⁹ Although market and credit risk cannot be separated, in practice risk managers and regulators still handle them separately because they require separate approaches. Market risk is calculated on banks' trading books,¹⁰ and credit risk on their banking books.

Banks have developed sophisticated in-house models to **measure** and manage their **market risk** (these VAR models are also accepted by the regulatory authorities for specifying capital requirements). Taking the risk-reducing effects of netting and portfolio diversification into account, these VAR-type models quantify the full (both specific and general) risk arising from changes in market prices. In contrast, the standard methods developed by the **regulatory authorities** (see BIS [2000]) separately handle specific and general market risks and then add them up. There is allowance for certain netting but not for the impact of diversification.

Banks may also use VAR-type models to **measure credit risk**. This, however, gives rise to a number of issues stemming from the nature of credit risk. That is why the acceptance of these models by the regulatory authorities to calculate capital requirement is being delayed. The majority of these models calculate the probability density function of changes in the value of credit portfolios using so-called transition probability matrices.¹¹ Banks, however, are required to follow the **standard regulatory method** based on risk weights to determine capital requirement against credit risk. This method is strongly criticised because it gives a very rough estimate of credit risk exposure (primarily, the accuracy of risk weights is questioned).

The approaches presented above provide benchmarks for us when making decisions about the methods of stress tests. The choice is influenced by the nature of the analysis (we do not want to assess the risk of individual banks, but systemic risk), yet the most effective con-

straint is the availability of data. In the case of market risk, we choose one of the standard methods (with a number of simplifications). However, the choice is much more difficult in the case of credit risk. Since we regard the standard risk weighting method as inappropriate, we use an alternative approach that is in our view more accurate but still gives a very rough estimate for credit risk. For this alternative method, the various credit VAR models will provide the benchmark.

4 Methodology and dataset

Methodological introduction

Let's start with a hypothetical portfolio. We assume that among the assets of banks there are bonds and loans, and both can be denominated in either domestic or foreign currency. Our objective is to examine the impact of the specified market and credit shocks on the market value of the banks' portfolio.

To calculate the change in value of **bonds** (the impact of an **interest rate shock**) we employ duration (interest rate sensitivity) ratios. This, however, enables only the measurement of general risk. This is not a problem in the case of government securities, which amount a substantial portion of the banks' bond portfolios, as their specific risk is zero. However for the rest of the portfolio we also calculate credit risk, which will substitute specific risk calculation (see later).

The impact of the other element of market risk, the change in **exchange rates**, is added to this; this is calculated for the entire foreign exchange portfolio, that is, on both bonds and loans.

⁸ See, for instance, the study of Jarrow-Turnbull (2000).

⁹ This co-movement may be not only negative but also positive; this, however, is less relevant for this study.

¹⁰ Except exchange rate risk, which is to be calculated for the entire foreign currency denominated portfolio.

¹¹ The transition probability matrix gives the probability of a claim of a given rating (e.g. BB) being re-rated to another rating category over a given period, generally a year. These probabilities are calculated on the basis of the ratings by external rating agencies or the internal ratings of the banks themselves and the changes therein.

The method employed here is a simplified version of the standardised method recommended by BIS to measure general market risk (and within it the so-called maturity method). According to BIS regulations, in the absence of internal models, banks may use the standardised method to determine market risk and the corresponding capital requirement. Based on the BIS guidelines, the specific risk of individual positions as well as their general market risk should be quantified. For the latter, two methods are available. Under the duration-based approach, interest sensitivity must be calculated for every single position. According to the maturity method, however, every position has to be grouped under maturity categories according to the remaining time until maturity or the first re-pricing date, and then the “assumed” duration values provided by BIS must be applied. We also use this method. In addition, BIS allows a complicated system of netting. We “net out” assets and liabilities in the same re-pricing category (including off-balance sheet items).

Changes in the market value of the **credit portfolio** (the impact of a **credit shock**) are captured through the changes in non-performing loans and their implied provisioning requirement. We assume that the change in the value of the portfolio may be expressed in terms of the provisioning rates. This gives a very rough estimate only, but we do not see a better alternative, since we are unable to meet the information requirement of the credit VAR models. Thus, for instance, the transition probability matrices, the financial indicators of debtor companies are not available.

In our analysis we rely on the following information taken from the audited financial reports of individual banks:

- Gaps calculated from the forint and foreign exchange **re-pricing balance sheet** of each bank (we, however, deduct loans from the assets, as we calculate credit risk on them).
- The rated **portfolio** of individual banks. All the assets to be rated (both balance sheet and off-balance sheet items) are grouped into two categories: performing and non-performing claims. Non-per-

forming claims include bad and doubtful assets.

- The **core (tier1) capital** of the banks. Calculated losses are always expressed as a percentage of tier1 capital of a given bank.

We calculate the impact of the interest rate shock on the basis of the re-pricing balance sheets and the effect of the credit shock on that of the rated portfolios. As one can see, there is an overlap between the re-pricing balance sheet and the portfolio to be rated. Those interest-bearing assets which are items to be rated are included in both statements. Hence they are taken into account in calculating both market and credit risk. Actually we substitute the specific market risk to be calculated on bonds by credit risk. Doing so we overestimate the full calculated risk for bonds. It should, however, be noted that the items concerned amount only a small portion of the rated portfolio, as by far the greater part consists of loans and off-balance sheet items.

We perform two types of scenario analysis, uncorrelated and correlated stress tests. The so-called **uncorrelated** stress tests do not take into account the correlation between individual risk factors. They assume that they evolve independently of one another and their effects are simply added up, whereby they may significantly overestimate the risk.

In the case of market risk, the scenarios are specified as the largest change in the market risk factors over a given historical observation period. Although these extreme events were observed at different points of time, we, however, pretend they took place at the same time. In addition, we also examine a hypothetical scenario that is much more extreme than those described above.

In the case of credit risk, we draw up hypothetical scenarios that are, however, partly based on historical observations. In the light of international experiences, these scenarios do not appear to be unrealistic or too extreme.

Using Monte Carlo simulation, we also perform so-called **correlated stress tests**. We generate random observations for the risk factors, taking into account the correlation observed between them and then calculate their simultaneous impact on the market values of bank port-

folios. Examining the left tail of the probability density functions obtained, we can give values similar to VAR. The impact of interest rate changes is quantified, also with the help of duration indicators. However changes in the quality of the loan portfolio are explained by a model that will be described in the next chapter.

Here individual scenarios differ according to the observation period and method used in estimating covariance matrices for the simulation.

Another important difference between correlated and uncorrelated stress tests is that while uncorrelated stress tests quantify the loss (change in value) caused by individual shocks, correlated tests give an estimate of risk exposure (in the form of a VAR-type measure).

5 Uncorrelated stress test

Market risk

In the case of market risk, we quantify the impact of changes in three risk factors on the value of the assets and liabilities of a bank (on the forint and foreign currency gaps calculated from the re-pricing balance sheets). The changes investigated are a rise in domestic and foreign market rates and change in the exchange rate (devaluation of the local currency). The impacts are calculated according to the following formulae.

Change in the value of domestic assets¹² due to interest rate changes:

$$\Delta MVP(\text{huf}) = -NPV * \text{Duration} * \delta^i \quad (1)$$

where ΔMVP is the change in the market value of the forint portfolio (gap calculated from the re-pricing balance sheet reduced by forint loans); NPV is its net present value; Duration is the assumed interest rate sensitivity of the given asset; δ^i is the change in the domestic interest

rate. We have to calculate the impact for all five repricing categories and then to take their sum. As seen from the formula, an increase in interest rates reduces the market value of the portfolio when the NPV term is positive (as duration is always of a positive sign). As NPV terms can be of alternating signs in individual re-pricing categories and duration is greater in longer term repricing categories, the sign of the impact on the entire portfolio is ultimately determined by the structure of gaps. To be more accurate, by the sign of the sum of the NPV*Duration terms. This highlights the major difference between the stress test and the interest rate risk analysis of the Stability Report. The latter focuses on the 0–90-day gap and the income effect of interest rate changes. Here value changes are calculated and the gaps in longer term repricing categories might have a substantial impact due to the higher duration values.¹³

With respect to foreign exchange assets:

$$\Delta MVP(\text{dev}) = -NPV * \text{Duration} * \delta^{fi} + (NPVl - NPV * \text{Duration} * \delta^{fi}) * \delta^e \quad (2)$$

where ΔMVP is the change in the market value of the total foreign exchange portfolio, NPV and NPVl are the net present value expressed in forint terms (foreign exchange re-pricing gap without and with loans respectively¹⁴), fi is the foreign interest rate, and e is the exchange rate. Here we quantify the combined effect of the change in interest rates and exchange rates. The formula reveals that the impact of an increase in interest rates and of devaluation may be of the opposite direction. It follows that, depending on the structure of the gaps and net present values, different exchange rate – interest rate change combinations might give the worst scenario. This draws attention to the difficulties in choosing scenarios.

¹² For the sake of simplicity we refer to assets, even when we mean the individual gaps of the re-pricing balance sheet, which is the difference between assets and liabilities of a given maturity.

¹³ This is illustrated by the breakdown of the losses caused by a domestic interest rate shock by re-pricing gap categories (loss in percentage of tier1 capital).

	0–30 day	30–90 day	90 day–1 year	1–2 year	>2 year	Per cent
Scenario 1	0.00	1.24	–2.02	–1.25	–1.06	–3.09
Scenario 2	0.00	2.49	–4.05	–2.50	–2.12	–6.18
						Total

¹⁴ As the impact of exchange rate changes is calculated both with respect to loans and bonds, while that of changes in interest rates only with respect to bonds.

As the detailed data required for duration estimation are not available, we use the so-called “assumed” duration values estimated by BIS. We use a number of simplifying assumptions.

- We assume that these duration estimates provide an approximately good description of the interest sensitivity of the market values of individual assets.
- The total value of each asset is assigned to the repricing bucket according to the remaining time till maturity or to the first re-pricing date. This leads to overestimating the value of duration in all those cases when there is substantial cash-flow prior to the date of re-pricing.¹⁵ The extent of the distortion depends on whether the overestimation of the duration affects the asset and the liability sides to the same extent. If so, then its impact is negligible.
- The assumptions of the duration method (e.g. parallel shift of the yield curve, assets are carried at market value) are not met in our case.
- The use of duration to the repricing gaps also assumes that the change in interest rates affects asset and liability side items the same way. We, however, are aware that this is not necessarily the case, as interest spreads can also change.
- Duration is accurate only in the case of small changes in interest rates, however stress tests examine the impact of drastic changes in interest rates. (This leads to upward bias.)

The change in the market value of the portfolios of individual banks is always compared to the core capital ($\Delta MVP/tier1$), because we want to examine whether there is sufficient capital to absorb the losses.

Credit risk

In the case of credit risk, we quantify the impact of extreme events as the provisioning requirement due to the deterioration in the quality of the portfolio, and this is then compared to tier1 capi-

tal. We use an average provisioning ratio of 50% and 85% for doubtful and bad debts respectively; these are the medium values of the bands recommended by the supervisory authority. The actual provisioning ratios of banks are slightly lower in the doubtful category and slightly higher in the bad category.

This provides a very rough estimate for the change in the market value of the credit portfolio. We assume that an X% provisioning requirement accurately gives the change in value. That is, the market value of the given claim equals (1-X) times the face value of the debt:

$$\begin{aligned} \Delta MVP(\text{credit risk}) &= - \text{provisioning rate} * \Delta NPL = \\ &= - 0,50 * \Delta DL - 0,85 * \Delta BL \end{aligned} \quad (3)$$

where NPL indicates non-performing loans, DL doubtful, and BL bad loans.

Data and scenarios

For **domestic market risk** we use the following variables and periods to specify the **scenarios**:

Domestic interest rate: the first scenario equals the largest change **in the 1 month inter-bank market rate** over 4 weeks (1 month) between January 1995 and December 2000. The

We used the average rate weighted with the opening stocks whose period to maturity was between 17–35 days. (We chose this interval, because before 1998, records were kept on the basis of calendar days, where a month implied 28–31 days. Since then, records have been kept on the basis of workdays, where 20–23 days correspond to a month.) In the records of interbank rates, the opening and the active stocks can be distinguished. In a somewhat misleading way, the **opening** stock refers to the transactions of the day, while the active stock, to total stock outstanding. For us, the opening stock is relevant. A distinction is made also between stocks withdrawn and **placed out**. We used the latter, as – according to experience – withdrawn stocks are less accurately recorded and reported moreover, there are major leaps also in the time series and a transaction may carry away even the calculated average rate. This problem appears less acutely in the case of stocks placed out.

¹⁵ The duration calculated in this way is greater than the “actual” average maturity (weighted with the net present value of the cash-flows). However interest (which is included in the cash-flows) is fully omitted from the calculations, which causes downward bias.

greatest rise was observed on March 10, 1995 at 5.62 percentage points (daily data series).

The second scenario is based on the change in the average yield (weighted with the amount of the bids accepted at the auction) on **3-month discount treasury bills**. In the period 1992–1999, the average yield calculated in this way made the biggest jump in September 1993 at 5.0 percentage points (108 monthly data).

In calculating discount T-bill yields, it would be necessary to use the data of secondary trading, but the available time series is very short. The State Debt Management Centre discloses the benchmark yields calculated on the basis of secondary trading only since February 1997. Incidentally, we also looked at their monthly average, where the greatest change was 1.59%, much lower than the value given above.

As to **foreign interest rates**, the first scenario is based on the largest rise in the daily **1-month DM LIBOR** rate taking place over four weeks in the period between October 1995 and January 2000. The largest rise was 0.6 of a percentage point on 29 November 1999. At the prevailing low nominal interest rate this meant an increase of 20%. The other extreme event was the largest rise of the monthly average of the **3-month DM LIBOR** rate in the period between January 1990 and December 1999. This was 0.65 of a percentage point in October 1999, corresponding to a change of 24% relative to the average of the preceding month.

We also examined a third hypothetical scenario assuming a 10 percentage point change in foreign interest rates.

As to **exchange rate changes**, we examine the **Ft/DM spot bid closing** rates. The first scenario is given by the largest percentage change in the daily data relative to the values four weeks before. In the period between January 1995 and January 2000, the largest change was measured on 13 March 1995 when the forint was devalued by 16.7%. The other extreme value is given by the largest percentage change in the monthly average of the above exchange rates in the period between January 1990 and December 1999 (this

was 12.5% in January 1991). We are well aware that these jumps arose from the practice of devaluation in those days. In the current crawling peg regime, the maximum change in exchange rates would be much lower assuming normal circumstances. The stress test, however, is designed to examine extraordinary events. In the light of international experience, the devaluations of 12.5% and 16.7% cannot be regarded as excessive.

The IMF (1998) analysis of financial crises requires an at least 25% annual devaluation to qualify as a currency crisis. The minimum capital requirement specified by the regulatory authorities may provide another benchmark to define exchange rate shocks (in the case of BIS this is 8%, while DPG recommends 6% for the major currencies), as the shocks examined in stress tests must be much greater than these.¹⁶

The fact that a single foreign currency is included in our analysis is a strong simplification.¹⁷ The DM was chosen because of the close economic relations of the two countries as well as because the DM (or the euro) is the predominant foreign currency in the balance sheets of the banks. There are other factors ignored here, which also influence exchange rate risk (cross-rate risk against a third currency, the risk arising from the different denominational composition of the asset and liability side of the balance sheet).

The scenarios are summarised in Table 1.

To calculate net present values, we need **discount factors**. These are estimated on the basis of the December 1999 average yield on Hungarian and German government securities with the appropriate maturity (closest to the given re-pricing period).¹⁸ BIS recommendations are used for the assumed **duration** values (see BIS 1996) (See Table 2).

¹⁶ If the band is substantially broadened, it should be considered whether to replace the above scenarios with the band. This might be justified by the experience of countries subject to significant devaluation pressure. Governments may have a very strong interest in maintaining their exchange rate regime. Therefore, they prefer to undertake other forms of adjustment within certain cost limits.

¹⁷ The available bank data do not allow the use of a more sophisticated method.

¹⁸ In principle, we should calculate with expected yields and not with risk-free yields.

Table IV.1 Scenarios based on the largest change in risk factors

	Scenario 1	Scenario 2	Period	Scenario 3
Domestic interest rate				
1-month interbank (daily)	5.62%		Jan. 1993–Dec. 1999	
3-month discount T-bill (monthly average)		5.0%	Jan. 1992–Dec. 1999	
Foreign interest rate				
1m DM LIBOR (daily)	0.6%		Oct. 1995–Dec. 1999	
3m DM LIBOR(monthly average)		0.65%	Jan. 1990–Dec. 1999	10%
Exchange rate				
FT/DM1 (daily)	16.7%		Jan. 1995–Dec. 1999	16.7%
FT/DM1 (daily)		12.5%	Jan. 1990–Dec. 1999	

Table IV.2 Discount and duration factors

	0–30 days	31–90 days	91–365 days	1–2 years	>2 years
Discount factor					
Domestic assets	0.9894	0.9686	0.8801	0.7882	0.6434
Foreign assets	0.9972	0.9916	0.9632	0.938	0.843
Duration	0	0.2	0.55	1.25	2.5

In the case of **credit risk**, we examine the effects of two credit events. First we take a shift in the asset portfolio from risk-free government and central bank assets (decreased by half) to loans (increased by the same amount). We also suppose that the composition of the portfolio in terms of performing and non-performing claims does not change (corresponds to the end of 1999 status). This is a hypothetical scenario, but is not unrealistic. On one hand, banks hold substantial amounts of government and central bank assets in their portfolios. On the other, household and corporate loans also have a substantial growth potential (this is justified by the low loan/GDP ratio, good economic prospects and fierce competition among banks for customers).

Second, we examine the impact of a ‘two standard deviation’ increase in non-performing loans, with the total credit portfolio remaining unchanged. We give two estimates for the value of δ , based on data of credit portfolio ratings in the periods 1995–1999 and 1994–1999. Not surprisingly the second estimate is bigger for the

majority of banks, as loan portfolios still deteriorated substantially in 1994.

The ‘two standard deviation’ growth, as a result of which the share of non-performing loans is more than doubled, is not unrealistic. At times of bank crises, the share of non-performing loans may double or even triple (see, for instance, González-Hermosillo et. al (1996) on the Mexican crisis).

Both scenarios imply that the impact of individual shocks depends on the current portfolio composition of individual banks. Those banks suffer the greatest loss that had bad portfolio at the end of 1999. This approach is warranted by the high correlation observed between expected and non-expected risks: where the expected risk – the average probability of default – is high, the unexpected risk (that is, the volatility of the above indicator) is also higher.¹⁹ The experiences of bank crisis also indicate that those banks which had problems even prior to the crisis incur the highest losses during a crisis. The argument against this method is that the current bad portfolios in many cases still reflect the impact of the bad loans inherited from the period prior to the transition.

¹⁹ See Moody’s Investor Service: Corporate Bond Defaults and Default Rates 1970–1994.

Correlated stress test

Uncorrelated stress tests described in the previous chapter do not take into account the relationship between the risk factors. They analyse the effects of interest rates, exchange rates and credit events separately. By taking into account the correlation among them, we are able to quantify the simultaneous effect of the shocks. Hence we can obtain a truer and fairer view of the banks' risk exposure. Using Monte Carlo simulation, we generate random shocks for the variables, which determine market and credit risk exposure. The simulation is based on the covariance matrices of the given variables (derived from their correlation matrix and variances).

Then we take the Cholesky decomposition of these matrices yielding matrix Q which satisfies

$$\Sigma = Q'Q$$

Then we take a vector of independent standard normally distributed random variables: $X: N(0, I)$. Multiplying this vector by Q we obtain δ , the vector of innovations with a covariance matrix i.e.,

$$\delta = Q'X \quad \delta \sim N(0, \Sigma)$$

Using a random number generator, we generate 10,000 observations for each (independent, standard normally distributed) variable. Multiplying them by Q we obtain 10,000 innovations for each risk factor.

Then we quantify the simultaneous impact of individual shocks (innovations: δ s) on each bank's portfolio. The way we do this is described in the following sections. The probability density function of calculated losses (relative to tier1 capital) is then derived. By analysing the left tail of these density functions, we can establish the maximum loss that will not be exceeded in 99% of cases.

To determine market risk we use the covariance matrix

$$\Sigma = VCV(\Delta i, \Delta e/e, \Delta f_i),$$

And for credit risk²⁰ the matrix is

$$\Sigma = VCV(\Delta r_i, cpi, \Delta e/e, \Delta ip(-1))$$

where

- i is the change in the domestic interest rate (change in the monthly average of the 3-month discount T-bill)
- e/e is the percentage change in HUF/DEM exchange rate (percentage change in the monthly average of end-of-the-day bid prices)
- f_i is the change in foreign market rates (change in the monthly average of the 3-month DM LIBOR)
- r_i is the change in the real interest rate
- cpi is the 12-month consumer price index
- $ip(-1)$ is the percentage change in the 12-month volume index of industrial output (adjusted seasonally and by the number of working days), which is a one-period delayed variable.

²⁰ These variables were chosen on the basis of theoretical considerations and regression estimates.

We performed tests under three scenarios. Under the first two, we calculated covariance matrices for two different periods, these being 1998–1999 and 1995–1999. For the third scenario, we took the maximum values of the correlation coefficients and variances calculated over 12-month periods between 1995 and 1999. Then we derived the covariance matrix. Strictly speaking only the latter can be regarded as a stress scenario, as the first two are based on historical averages.

The correlation matrices can be found in the tables of the appendix.

Modelling credit risk

With respect to **market risk**, to quantify the impact of changes in interest rates and exchange rates, we follow the duration method described in the previous chapter (see equations (1)–(2)). To measure **credit risk**, however, we use a different approach. We do not examine the effects of hypothetical credit events, instead we set up a model, which attributes changes in the quality of the portfolio to macroeconomic factors. Banks employ internal credit risk models of very different approaches. We cannot meet the data requirement of them, hence we have to use a different approach. Theoretical and empirical works have demonstrated that the quality of the loan portfolios (here described by the share of non-performing loans) also depends on the fundamentals of the economy and moves together with the business cycles (improving upon recovery and substantially deteriorating at times of recession).²¹ The internal model developed by the McKinsey company is the only one which defines transition probability matrices conditional on macro variables (GDP, unemployment, inflation, etc.).

²¹ Loose lending practices and excessive loan expansion pave the way for the subsequent deterioration in the quality of loans already at the stage of recovery. At times of recession, in contrast, the too stringent lending behaviour of banks tends to deepen the crisis. This behaviour of financial markets significantly amplifies the business cycle. This phenomenon is referred to as the pro-cyclicality of financial markets.

²² The estimate is based on the quarterly data for the period 1994–1999. The time series is short but there are no portfolio rating data for earlier periods. Moreover the preceding period has very bad characteristics in a statistical sense, because of the presence of structural breaks.

²³ Provisioning ratios were given for each bank as the weighted average rate at the end of 1999 ($0,5 \cdot \text{DL}/\text{NPL} + 0,85 \cdot \text{BL}/\text{NPL}$).

Our model relies exclusively on macroeconomic variables. The probability of default is substituted by the provisioning rates. This means that we model only systemic risks. The great advantage of this approach is that it handles market and credit risks in an integrated framework, as the macro variables determining market risk are also there in the equations explaining loan quality. This approach is in accord with the aggregate nature of the tests in the sense that the general elements of risks are more important for the stability of the system.

We chose the model and estimated its parameters using OLS regression.²² We made estimates for the entire banking sector as well as for groups of banks and the coefficients obtained in this way were applied to the individual banks. Based on theoretical considerations and the results of the estimates, we found the following model suitable to describe non-performing loans:

$$\Delta \text{NPL}/\text{TL} = \alpha + \beta_1 \cdot \Delta r_i + \beta_2 \cdot \text{cpi} + \beta_3 \cdot \Delta e + \beta_4 \cdot \Delta \text{ip}(-1) + \mu$$

That is to say, the changes in the real interest rate, inflation, the percentage change in exchange rates and the change in industrial output are included under the explanatory variables.

Based on the increment in non-performing loans, we can determine the provisioning requirement set by them.²³ We regard the value obtained in this way as identical with the change in the market value of the loan portfolio.

The following table summarises the parameter estimates of the model explaining non-performing loans (See Table 3).

Tabke IV.3 Parameter estimates

	d_ri	cpi	d_e	ip(-1)
Banking sector	0.4638*	-0.3472**	0.4088*	-0.4035*
Large, profitable banks	0.2658	-0.2913	0.3314	-0.2859
Large, loss-making banks	0.4336*	-0.3669**	0.4954*	-0.3410*
Medium-sized, profitable banks	-0.3002	0.2114	-0.3606**	0.4339*
Medium-sized, loss-making banks	0.2096	0.0374	-0.1216	-0.0519
Small banks	-0.2144	-0.2746	-0.0663	-0.3111
Specialised financial institutions	-0.0767	0.239	0.0168	0.6709*

* At a 5% significance level.

** At a 10% significance level.

As the coefficients are not significant in all cases, and for certain groups even the interpretation of their sign is cumbersome, we regard these calculations as having more of an experimental nature. As the sign of the individual parameters varies across groups, the third scenario (which is based on the largest correlation coefficients and variances) does not necessarily give the worst results.

6 Results

Uncorrelated stress test

Market risk

The *domestic interest rate* risk – i.e. the loss of value of the portfolio expressed as a percentage of tier1 capital – is low with respect to both the individual banks and groups of banks²⁴ (see Table 4). It is below 2% in most of the groups and exceeds 10% only for a few banks.

As to *ForEx risk*, the values for the groups are low. There are, however, a few banks with losses in the range 10–45%. The third scenario shows an increase in value for the entire banking sector. However, there are extreme individual data behind this: the sum of both losses and gains are much higher than in the other two cases.

Risk exposure can be better assessed for the entire banking sector when **cumulative data** and various **ratios** are also studied. Thus it is, for instance, worthwhile having a look at the cumulated data sorted by the magnitude of loss and their share in the tier1 capital of the banking sector.

- With respect to domestic interest rate risk, 59% of the total exchange rate loss would be incurred by a single bank under both scenarios; this, however, makes up no more than 1.8% of the total capital of the banking sector.
- The concentration of losses is lower in the case of ForEx risk. Under the first two scenarios, the first 5 banks suffering the largest loss make up 51% of the total loss corresponding to 1.3% and 1.8%, respectively, of the tier1 capital in the banking sector. Under the third scenario, losses

Table IV.4 Market risk at the end of 1999
(as percentage of tier1 capital)

	Per cent				
	Domestic interest rate risk		Foreign interest rate and exchange rate risk		
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 3
Banking sector	-1.7	-1.5	-1.6	-1.2	0.2
Large, profitable	-5.5	-4.9	-2.2	-1.6	-1.0
Large, loss-making	-1.3	-1.2	-1.6	-1.2	0.1
Medium-sized, profitable	-1.6	-1.4	-1.2	-0.9	-2.4
Medium-sized, loss-making	2.4	2.2	-3.5	-2.3	13.4
Small banks	1.2	1.1	1.9	1.5	7.7
Specialised financial institutions	1.3	1.2	-2.6	-2.1	-12.4

are much more concentrated: at 70% and 3.6% of the above values.

No correlation between the profitability of the banks (that is, the fact that the given bank made a loss or a profit in 1999) and the loss due to the market shock can be established on the basis either of the bank group or the individual bank data.

Overall,²⁵ it can be established that at the end of 1999, **the risks arising from both domestic and foreign interest rate and exchange rate changes are moderate, albeit fairly concentrated.** Yet the picture may substantially change with the change in foreign exchange positions (and the composition of the re-pricing balance sheets). Moreover, this analysis keeps a number of exchange rate risks hidden that may arise from the denominational composition of the balance sheets and the changes in cross rates. We shall revisit these problems in Chapter 6.

²⁴ Group data were calculated in the following way (for both market and credit risk). The effects of stress events were quantified for each individual bank. These losses and gains were then summed and compared to the tier1 capital aggregated by bank groups. This makes a difference in the case of credit risk: for the impact of a credit event (e.g. a 'two standard deviation' increase in NPL) on aggregated group-level portfolios may substantially differ from the value obtained by adding up individual effects. The difference between the results obtained by the two methods can be material (the sum-up method gives lower loss in our case).

²⁵ Total market risk could be obtained by adding up the domestic interest rate and ForEx risks calculated above. We did not perform the above addition because, in our view, there is little probability of a substantial increase in foreign as well as domestic interest rates simultaneously with the devaluation of the local currency. This would go against interest rate parity.

Credit risk

The results of **credit risk** calculations²⁶ show a much more unfavourable picture (see Table 5). The shift of assets (from risk-free government²⁷ and central bank securities into loans) would reduce the value of tier1 capital by no more than 5.4% for the banking sector as a whole. However a 'two standard deviation' growth in non-performing loans would give rise to substantial losses amounting to 33.8% and 42.0% of the tier1 capital of the banking sector. In the case of the first five banks incurring the largest loss, the loss would exceed their tier1 capital. Here there seems to be a correlation between the magnitude of loss and profitability.²⁸

The loss that would be suffered by the profitable large banks would account for less than 8% of their capital, while this figure would be above 100% in the group of loss-making large banks.²⁹

Looking at the cumulated data, it is worthwhile to separately analyse Scenario 1, Scenario 2v and Scenario 2. Under the first scenario, the

weight of investment in government securities, the quality of the portfolio and, of course, capitalisation influence the relative and absolute amount of the loss. This is how it may happen that a bank whose relative loss (in terms of its tier1 capital) is not particularly high (13.5%) would account for 39% of the total loss (suffered by the banking sector). This is unambiguously attributable to the high weight of investment in government papers. Here loss is concentrated in a few major banks. In a relative sense, however, the impact of this credit event is not significant, even though it is well above that of market risks.

In contrast, under Scenarios 2 and 2v there is no question that the large loss-making banks would suffer most of the losses. The 5 banks, which would practically lose their entire capital, account for more than 70% and 76% of the total loss of the banking sector – this loss would make up 23% and 32%, respectively, of the total capital of the banking sector.³⁰

The market share of these banks (calculated on the basis of the value of their total assets) is 23.1%.

Table IV. 5 Credit risk at the end of 1999
(as percentage of tier1 capital)

	Per cent		
	Scenario1	Scenario 2v	Scenario 2
Banking sector	5.4	33.8	42.0
Large, profitable	7.6	7.8	7.4
Large, loss-making	12.0	137.2	189.6
Medium-sized, profitable	0.3	4.9	4.6
Medium-sized, loss-making	2.7	26.2	28.0
Small banks	1.4	11.6	12.5
Specialised financial institutions	4.6	37.5	35.0

²⁶ While in the case of market risk a negative sign indicates a loss, a positive sign the increase in value, in the case of credit risk, the sign is always positive, as here we quantify only the additional provisioning requirement. Yet here this means a loss.

²⁷ We also included bail-out bonds. It is questionable whether these can be regarded as risk-free and liquid securities, that is, an investment that could be easily turned into cash and placed out as loan. However their share is significant only in the cases of two banks.

²⁸ Only the groups of the large and medium-sized banks were broken down to loss-makers and profitable ones.

²⁹ Recall our warning, that the method applied projects this *ab ovo*.

³⁰ The question arises what losses were taken into account when aggregating the data. Shareholders could lose at most their invested assets. Deposit insurance covers a part of the losses suffered by deposit holders. However this has a cost for the financial sector, that is, we have to calculate with the total loss. Another question is whether tier2 capital could also be taken into account to cover losses, and if so, to what extent.

Correlated stress test

Market risk

The results obtained by simulation (VAR measure of losses expressed as a percentage of tier1 capital with one percent confidence level) also bear witness to **a negligible extent of market risk**.

Of the three scenarios, VAR values are higher under Scenario 2 (where covariance matrix is calculated for the period 1995–1999) and Scenario 3 (where the covariance matrix is based on the maximum correlation and variance). There is no difference between these two bad scenarios as far as the ForEx risk is concerned. The domestic interest rate risk is, however, much greater under the third scenario than under the second one, three times as high for the entire banking sector (but still it is only 7%) (See Table 6).

Overall it can be established that **the results of both the correlated and uncorrelated stress tests demonstrate that market risks are low**.

Table IV.6 The impact of market risk on the value of the portfolio
(1 percentile, % of tier1 capital)

	Per cent					
	Scenario 1		Scenario 2		Scenario 3	
	Domestic interest rate	ForEx	Domestic interest rate	ForEx	Domestic interest rate	ForEx
Banking sector	-1.6	-1.3	-2.2	-3.6	-7.4	-3.4
Large, profitable	-2.2	-0.6	-3.1	-2.5	-10.2	-2.3
Large, loss-making	-1.9	-1.4	-2.8	-2.6	-9.1	-2.6
Medium-sized, profitable	-0.6	-1.2	-0.8	-4.4	-2.8	-4.3
Medium-sized, loss-making	-1.4	-2.2	-2.0	-4.3	-6.5	-4.6
Small banks	-0.9	-2.0	-1.3	-4.4	-4.3	-3.6
Specialised financial institutions	-1.8	-1.2	-2.6	-5.7	-8.6	-5.3

Credit risk

We ran two versions for credit risk calculations (see Table 7). Under one, we estimated parameters for the entire banking sector only, while in the second, for groups of banks, these were then applied to individual banks. The results were fairly different. This indicates that the test is sensitive to the choice of model and also to whether we perform the estimates for groups or for the aggregated data of the banking sector. However, it is worthwhile calling attention to a few interesting phenomena. One of them is that according to almost every calculation, the shock would affect the loss-making banks more vigorously. Even though in this case the current quality of portfolios influenced the result to a much lesser extent than in the case of the uncorrelated stress tests. The other is that we obtain better results for the profitable large banks when applying parameters estimated for bank groups than for the entire banking sector. (There is no substantial difference in the case of the loss-makers.)

Although that was expected, we did not get the worst results for Scenario 3. Which points to the difficulties in drawing up scenarios.

As the regression estimates are unreliable (the time series is too short, the parameters are not significant for every bank group and in certain cases the coefficients cannot be interpreted) and there is a substantial “model risk”, these results should be handled with strong reserve. Possible extension of this work could be the improvement of this model, the performance of the analysis of the missing time series and eventually the use of panel models.

Table IV.7 The impact of credit risk on the value of the portfolio
(1 percentile, % of tier1 capital)

	Per cent						
	Banking sector	Large, profitable	Large, loss-making	Medium-sized, profitable	Medium-sized, loss-making	Small banks	Specialised
With parameters estimated for bank groups							
Scenario 1	-35.2	-27.2	-64.6	-40.1	-16.0	-22.6	-8.3
Scenario 2	-62.3	-53.2	-136.4	-60.4	-17.6	-28.7	-10.0
Scenario 3	-45.4	-29.2	-81.4	-45.3	-44.5	-40.2	-7.7
With parameters estimated for bank groups							
Scenario 1	-46.0	-36.3	-67.2	-48.3	-76.4	-26.2	-6.7
Scenario 2	-92.0	-72.7	-134.4	-96.6	-152.9	-52.5	-13.4
Scenario 3	-53.3	-42.2	-78.0	-56.0	-88.6	-30.5	-7.8

7 Examination of the effects of a few simplifications

When looking at exchange rate risk, we practically fully disregarded the risk arising from changes in **cross rates**. Szegedi-Szalay (1999) provided a top estimate for the (total) loss arising from exchange rate changes based on 1998–1999 data. They found that by far the greater part of the potential exchange rate losses arose from the foreign exchange open position (foreign exchange-forint relationship), and the measured cross rate risk was of lesser significance. In their view, the highest loss calculated for the autumn of 1998 (the period characterised

by the widest total open net position) amounted to Ft5–6 billion, that is 12–15% of the after-tax profit for the given year,^{31,32} of which cross rate risk accounted for the smaller part. (In the most extreme cases calculated by us, losses made up a multiple of this.) From this we may conclude that taking cross rate risks into consideration would not substantially modify the results for the entire banking sector. Yet it would be worthwhile to update the calculations of the study referred to and perform them for 2000 data as well: that year, banks again built up substantial net foreign exchange positions in the first quarter (although this did not reach the 1998 magnitude). The EUR/USD showed significant volatility – according to various calculations we could observe a maximum change of 9–11% in 2000, corresponding to a similar rate devaluation of the forint against the dollar. This is a much greater change than what was examined by the above authors.

A **change in the structure of foreign exchange gaps** could also have a considerable influence on the calculations. To test this assumption, we also performed the uncorrelated stress tests for ForEx risks on the basis of data for the first and second quarters of 2000 (see Table 8).

In the first quarter, an increased exchange rate risk is reflected in the March data (owing to the leap in the open position against the forint). The exposure of the banking sector quadrupled, even though its size was still low (5–7%). The difference becomes slightly higher when the impact of the change in Tier1 is netted out (that is, when the calculations are made with end-of-1999 capital data). However, the changes observed were different in magnitude and direction for each bank. That is to say, the volatility of net foreign exchange positions and re-pricing gaps may also increase the calculated potential

market risk at the level of the banking sector, but it generates much greater changes at the level of the individual banks.

The lesson to be drawn from this comparison is that the results of the stress tests are influenced by the change in the foreign exchange re-pricing balance sheets. We know from the experiences of recent years that the foreign exchange open positions and the structure of the foreign exchange re-pricing balance sheets are highly volatile. Hence it is very important to perform the analysis on an ongoing basis and to monitor the changes in exposure in time. However, as the exposure is not significant at the level of the banking sector, this has more importance in the analysis of the individual banks and in assessing risk concentration.

We did not make similar calculations for credit risks, as there – in contrast to the re-pricing gaps – a drastic rearrangement in the portfolios to be rated is unlikely to take place in the ordinary course of business.

8 Closing remarks

The methods applied here – with the given scenarios – provide an upper estimate for the exposure of domestic banks to extreme market and credit risk events. The results of the tests demonstrate that potential **market risk shocks** would give rise to low, although relatively concentrated losses. In contrast, a substantial deterioration in the **loan portfolios** would cause substantial loss of capital at the level not only of the individual banks but also at that of the banking sector. By far the greater part of the loss of value would be concentrated in the loss-making large banks, which is attributable to the methods applied by us only in part.

When assessing the effects of a potential credit shock, we should also take into account the ownership structure of the domestic banking sector and the **financing structure of the corporate sector**. Hungarian large companies accounting for the greater part of the current borrowers are characterised by low leverage ratios. This reduces the probability of bankruptcy/default and thereby also the occurrence of the extreme credit events studied. The aggregated le-

Table IV.8 ForEx risk based on Q1 and Q2 2000 data

	Per cent	
	Scenario 1	Scenario 2
December 1999	-1.6	-1.2
March 2000	-6.4	-5.0
June 2000	-3.0	-2.4

³¹ This does not include the profit/loss data of the three large loss-making banks.

³² We examined the maximum movement within the band, that is, the 4.5% devaluation and the 3.56% change in the USD/DM rate.

verage ratios, however, may hide extreme individual cases. Hence we plan to analyse the leverage and debt service ratios of the largest borrowers. It is important to perform this because client concentration is high among the Hungarian banks (see the relevant part of the first Stability Report).

As far as the **ownership structure of the banks** is concerned, the well-capitalised, highly rated professional investors backing the Hungarian banks would presumably put up the capital required to cover losses even in the case of a major credit shock. Because of this, a deterioration in the loan portfolios would presumably not give rise to severe system problems.

What calls for prudence is the rapid expansion and keen competition that can already be observed in the case of a number of banks (this may be given another impetus with Hungary's accession to the EU in the not-too-distant future) because that may induce the banks to assume substantially more risk. The potential growth areas (small and medium-sized businesses, household lending) also render a rise in credit risk more probable. At the same time, these markets account for only a fraction of the banks' portfolios for the time being. Hence in the short term it is unlikely that these would constitute the point of departure for any significant shock.

To assess system-level risks, a number of other characteristics should be taken into account over and above the results of the stress

tests. The impact on the entire sector also depends on how strong the impact of the risk rippling over is. For instance, it may occur that the system-level lending and/or market risk is relatively moderate but, when the loss is concentrated among the banks which are characterised by extensive interbank relations, then significant ripple-over effects may multiply the magnitude of the risk. Hence the mapping of interbank exposure would significantly enrich our knowledge of system-level risks. According to our current knowledge, the interbank exposure to counterparty risk is not too high at an aggregated level (the interbank market is small and counterparty risks arising from the settlement systems are relatively low). When evaluating the results of the tests performed, it should be emphasised that the methods employed used a number of simplifications and assumptions; moreover, the time series used also gave rise to serious problems when making estimates. Hence the calculated absolute magnitudes are less reliable. It is our intention to perform stress tests on an ongoing basis in the future, focusing on the analysis of the changes (aggregate exposure, concentration). We wish to fine-tune the modelling of credit risk and we intend to extend our calculations to additional scenarios. After the introduction of the trading books, we shall have much more reliable data and the possibility of extending the tests to non-bank financial institutions could also be considered.

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Appendix

Correlation matrices

Market risk				
Scenario 1	d_dkj3m	d_ftdm	d_3mlibor	
d_dkj3m	1	0.42	0.12	
d_ftdm		1	0.18	
d_3mlibor			1	
Scenario 2	d_dkj3m	d_ftdm	d_3mlibor	
d_dkj3m	1	0.22	0.17	
d_ftdm		1	-0.05	
d_3mlibor			1	
Scenario 3	d_dkj3m	d_ftdm	d_3mlibor	
d_dkj3m	1	0.51	0.72	
d_ftdm		1	0.75	
d_3mlibor			1	

Credit risk				
Scenario 1	d_ftdm	d_realir	Cpi	d_ip(-1)
d_ftdm	1	0.42	0.10	0.34
d_realir		1	-0.01	0.27
Cpi			1	0.31
d_ip(-1)				1
Scenario 2	d_ftdm	d_realir	Cpi	d_ip(-1)
d_ftdm	1	-0.34	-0.16	0.34
d_realir		1	0.15	-0.21
Cpi			1	-0.21
d_ip(-1)				1
Scenario 3	d_ftdm	d_realir	Cpi	d_ip(-1)
d_ftdm	1	0.68	0.45	0.67
d_realir		1	0.54	0.55
Cpi			1	0.64
d_ip(-1)				1

LENDING RISK MANAGEMENT IN THE HUNGARIAN BANKING SECTOR

Introduction

The National Bank of Hungary has paid particular attention to mapping out the risks, which the banking sector had to face over the past few years. As the fourth element in assessing banking risks (after interest rate, exchange rate and group risks), the aim now is to provide a comprehensive evaluation of the lending risk management and exposure of the banks. The importance of this topic is underlined by the fact that all over the world the most severe banking problems have arisen from loose lending standards vis-à-vis customers, poor portfolio management and a failure to take into account changes in economic circumstances.

In the course of our study, we determined the main criteria of evaluation on the basis of the guidelines “Principles for the Management of Credit Risk” finalised by the Basle Committee for Banking Supervision in September 2000. It was according to this document that we assessed the banks’ lending policies, their lending rules, lending procedures, their management information systems and internal audit.

Risk management was examined exclusively with respect to corporate lending; mapping out retail lending and risk management was not a subject of this survey. Retail lending has fundamentally different characteristics and must be based on fully standardised loan appraisal and loan management systems. In view of the substantial increase in the volume of retail lending seen over the past two or three years, an examination of retail lending practices may be the subject of a subsequent independent study.

The information necessary for examining the corporate lending risk management practices of the banks was obtained by way of ad hoc reports. Primarily we requested narrative information, which we evaluated together with the numerical data available from the mandatory reports.

In this study, we processed the documents of the 22 commercial banks answering the ques-

tions posed. They represented 80% of the corporate credit portfolio of the banking sector according to the situation on 30 June 2000. The documents made available to us presented the status at the end of the first quarter of 2000; as a result of development projects implemented since our examination, changes may have taken place in the cases of some banks.

Below we present the findings of our survey, without reference to information concerning individual banks.

I. Summary assessment in light of the guidelines of the basle committee for banking supervision

I.1 Lending policy

All of the banks participating in the survey drafted their lending strategies, which determined the short and medium-term objectives for lending but, in many cases, the objectives specified were much more of a quantitative nature (e.g. increasing market share) than risk-oriented. Lending policy is developed either as part of the business policy plan or in an independent format (at about half of the banks under study). Generally, all the organisational units involved in a bank participate in the development of lending policy; nevertheless, it is an interesting point that Asset-Liability Committees were the main bodies in charge of drawing up lending policy at several banks.

In the practice of Hungarian banks, boards do not have a dominant role in developing lending strategies; they rarely provide concrete guidance as to the risks (e.g. counterparty/product/sector risks), which a bank should not undertake. It was rather ambiguous from the answers of some banks whether their lending policies were actually adopted by their boards of directors.

The content and level of detail of lending policies are very different; nearly a fifth of the banks have a comprehensive lending policy, which fundamentally meets the expectations set forth in the Basle Guidelines, that is, they specify the extent of their willingness to assume risk, set

forth sectoral and other portfolio-level limits and profitability expectations in detail.

The banks having substantial corporate clienteles characteristically specify the magnitude of lending risk, which they may assume in individual sectoral and clientele segments, while medium-sized and small banks tend to formulate no more than general lending goals with a view to increasing their market shares, and do not indicate precisely the direction in which they wish to expand. Deficiencies found at several banks include the failure to set up sectoral and product-level risk limits and to specify profitability expectations in an unambiguous manner. With some of the banks in foreign ownership, a potential problem is that the opinion of the Hungarian subsidiary bank is not invited with respect to local characteristics when developing lending policy.

The lending policies of most banks address the sectors, regions and products deemed to carry higher risk than the average separately, but they rarely specify the risks which the bank does not wish to assume. It is a general tendency that agricultural and food processing clientele are not regarded as a target market, whether from the point of view of profitability or market growth, but withdrawal from this market cannot be immediate or complete. Here the objectives set are a reduction in activity and an improvement in the security of the portfolios placed out.

I.2 Regulations

I.2.1 Principles of regulation, regulatory system

All of the responding banks have the lending rules required by legislation, which cover the most important elements of the lending process (preparation, decision-making mechanism, debtor rating, claim rating, provisioning, valuing of coverage). In developing their rules, they regard compliance with the provisions of Hungarian legislation and adjustment to the rules of the foreign owner as their primary criteria, but there are a number of banks that apply the rules of the parent bank essentially without modification, translated into Hungarian, in order to formally abide by the Hungarian provisions. Although taking into account the principles of lending reg-

ulation of the parent company and of the regulatory practice of the country of the parent bank is a natural expectation on the part of shareholders, it would be of the utmost importance that banks develop their lending and risk management procedures by considering their own position, their own target markets and strategies.

Among all the responding banks, the fundamental rules are supplemented by CEO's instructions and other internal procedures, but the specification of the procedures are not sufficiently detailed at many banks. The rules do not generally provide for the possibility of deviation from the general rules. Overall it can be established that an improvement in the standardisation of processes is called for.

There are relatively few banks which summarise lending related rules in a uniform lending manual, although this form could best guarantee the consistency of the rules, and their uniform and systematic updating. By adopting a uniform structure, the frequent problem of amending the various rules at different points in time and often taking less concerted efforts to harmonise them could be avoided.

With respect to the regulation of the lending process, three main types of the responding banks could be distinguished:

- Banks in foreign ownership, where the decision-making powers of the Hungarian management are limited, basically apply the rules developed by the parent bank. They do not take into account the Hungarian characteristics beyond the mandatory legal provisions, but most of them have good and detailed regulations. This group includes more than a quarter of the banks under study.
- The banks (characteristically privatised), where the scope of decision-making of the Hungarian management is larger and the bank has substantial domestic clientele, generally have detailed and thorough lending manuals. This group accounts for over a third of the banks under study.
- Several medium-sized or small banks have only those rules which are required by legislation, and even then only with the minimum content prescribed, that is,

they have not developed a procedural order that would cover the entire lending process. This group also includes more than a third of the banks under study.

1.2.2 Rules of debtor rating

A key element of responsible lending practice is debtor rating, which relies on a rather large number of factors aimed at determining the actual risk characteristics of the borrower, or rather the rules of debtor rating, which constitute the foundation for this. On the basis of the documents submitted, it can be established that there are significant differences in the debtor rating rules of individual banks, and shareholders tend to have a vigorous influence on the systems applied.

With the exception of one bank, every bank has developed more than the minimum three categories specified in the MoF Decree; their rating systems are more complex. At the same time, the five categories which constitute the average are insufficiently differentiated: when they are applied, by far the greater part of the Hungarian companies tend to fall into the same one or two categories. The schemes of banks that apply more than five (generally 7–10) debtor rating categories can be regarded as well differentiated (more than 30% of the banks under study). The most sophisticated debtor and claim rating systems in international practice may contain more than 10 rating categories; this we have not met with at a Hungarian bank.

The set of indicators applied in rating are markedly different. The subjective criteria of evaluation studied are multifarious; subjective indicators tend to be given a slightly excessive weight: the ratio of objective/subjective indicators is in most cases 60/40%, or something around that. Many banks apply their rating systems with slight modifications depending on the type of client.

It is difficult to compare the stringency of the debtor rating schemes of the banks but the reports of the supervisory authority reveal that the same client may be subject to completely different ratings at different banks, which again points to the often overemphasised role of subjective evaluation.

The existence of rules that meet legal requirements does not mean in itself that the lend-

ing risk management system of a bank is also of the appropriate standard in an economic sense. This is underlined by the experience that, while applying the current provisions concerning debtor rating, it happens that individual banks assess the creditworthiness and risk of a company quite differently.

1.2.3 Limits

The Basle Guidelines on lending attach outstanding importance to the development of an appropriate set of limits. The Hungarian regulations also require the application of limits; under MoF Decree 27/1998, limits must be set up against individual customers – except for household customers – in the rules of risk taking.

We found considerable weaknesses in the regulation and application of limits among several banks; many of them are still facing the challenge of developing their own set of limits (specified in rules in force), while others have developed limit rules that are no more than attempts at formal compliance with legal requirements.

The use of a set of lending risk limits is not widespread. The most important task is the development and application of a set of limits for client groups including lending other than those related to lending; in the absence of this, the assessment of the actual risk in a credit portfolio is not guaranteed in every case.

A bank's client and client group limits must be closely related to debtor rating. For many banks – those that have a properly functioning system of limits – this link is there, the limits are actually based on debtor rating, while other factors are also taken into account. At the same time, the answers of several banks indicated that the interrelation between the extent of the limit and the rating of the debtor was not strong enough.

According to the evidence of the study, a properly developed, well-functioning set of limits is still waiting to be developed at a half of the banks (some of them have not as yet developed limit rules of their own).

1.2.4 Claim rating, provisioning, coverage

The regulation of the rating of claims and provisioning meets the relevant statutory provisions at every one of the banks. The rating of claims and the extent of provisioning are basi-

cally determined – in addition to the delay in payment – by the value of the cover. The extent of the provisions to be set aside for the individual rating categories is adjusted to the limit brackets prescribed by the MoF Decree; the amount of the provisions are determined individually for each transaction characteristically on the basis of the decision of a top management forum. This practice implies the risk that the profitability criteria of the bank may influence the extent of provisioning. An important instrument in reducing lending risk is the requirement of various types of collateral (mortgage, guarantees, etc.) but the decision to lend must be based primarily on the capability of the debtor to pay. In practice, banks demand a coverage for the greater part of their placements; moreover, some of the banks extend credit exclusively under cover. The range of collateral accepted is wide and there are many practices employed to determine the value of the coverage. Several banks require coverage of a different extent depending on the rating of the debtor, but frequently they are reluctant to take action to require additional coverage when the rating of the debtor deteriorates. The value of the collateral is generally reviewed quarterly in relation to the rating of the claim, but presumably in many cases this means just a formal checking of the existence of the coverage.

Some of the banks in some cases permit exclusively cash-flow-based unsecured lending. Generally, however, only clients of the best rating (in Categories I and II), that is priority large companies, can obtain unsecured credit.

Many banks lack prudence to accurately regulate the method to be applied to determining the value of the collateral (prime cost, yield or market value) in specific cases, although the results of the methods referred to may differ by orders of magnitude and at many of the banks provisioning extends only to the amount of claims not secured by collateral. From a prudential aspect, it is favourable that more and more banks use liquidation value¹ as the value of the coverage.

1.2.5 Decision-making procedures

According to the study, the principle of the four eyes is enforced in the decision-making mechanisms at every bank with one exception; at the

same time, the mandatory examination of compliance with statutory provisions is rarely part of the decision-making process. Some of the banks in foreign ownership let the headquarters of the parent bank make the decision above a certain amount, which is frequently concomitant with a slowing down of the decision-making process.

The rules of a number of banks indicate that the assigning of decision-making powers to individuals, and hence their accountability, are not fully guaranteed.

In practice, the number of decision-making levels and the distribution of authority are not necessarily adjusted to the volume or complexity of the banks' lending activity. The survey showed that banks of similar conditions may substantially differ in terms of the centralisation of their decision-making system (the decision-making powers of the branches and the role of the management in making the decision concerning large credits).

1.3 The lending process

1.3.1 Organisational background

In practice, the three basic organisational units of lending activity are the branch/region, the corporate finance field and the organisational unit in charge of risk management. The basic units of lending are the branches or, in the case of major banks, the regions comprising the branches, which are responsible for the marketing and business acquisition part of lending. The regional headquarters are also responsible for monitoring the activities of the branches.

The corporate finance area is responsible for the strategic direction of activities belonging to the lending business and for co-ordinating these activities. In the cases of smaller banks, this area prepares loan applications, too. Other organisational units linked to lending activities – depending on the size of the bank concerned – may be the Regional Loan Appraisal Committee, the Central Loan Appraisal Committee and the management or board of directors, which make the decision on individual placements depending on the magnitude of the principal amount.

¹ Market price that could be realised within 6 months less the costs of liquidation and financing.

The risk management area (department) exercises lending risk control built into the decision-making process. Here the primary task is to size up client risk; to provide a critical analysis of the loan submissions; to make recommendations concerning the limit of commitments; and to set up risk limits at portfolio level. Banks with substantial branch networks also examine lending risk at regional level. For most banks, this is implemented with the collaboration of the staff member in the region in charge of risk management. Based on the documents received, it can be established that risk control is asserted at central level at all of the banks participating in the study, that is, lending may be effected exclusively with the approval of the organisational unit in charge of risk management.

The lending process is generally appropriately regulated. However, it is a problem that lending risk management activity (that is, the control built into the process) at portfolio level is rarely separated from monitoring (continuous *ex post* control). Naturally, in the cases of smaller banks, this could not always be applied, but in the case of banks with large credit portfolios this would indeed be necessary. The depth of credit monitoring is not generally prescribed within the framework of uniform rules. Various levels of monitoring operate depending on the quality of the debtor and the collateral backing the credit granted.

Lending and risk management are separated at departmental or management level in the case of every responding bank with one exception; but at top level, the two areas are supervised in several cases by the same deputy to the CEO or managing director.

The majority of the larger banks have their problem loans managed by a workout organisation. Some other banks, however, let the organisation manage the problem loans where they had earlier belonged.

² The problem with this indicator is that the coverage given includes in principle the collateral put up not only for credits but also for off-balance sheet items and interests.

³ The problem with the indicator is that while the full value of real estate coverage obviously and substantially exceeds the value of the claim, the cash coverage, the guarantees or assignment of sales revenue is only for 100% of the claim (or eventually increased by the amount of interest). Therefore, this indicator obviously gives a higher value at the banks where the role of coverage by mortgage is significant.

1.3.2 Provisioning and the use of collateral in practice

Experience shows that for the majority of the banks, provisioning at the end of the year exceeds the extent of provisioning in the course of the year, while the release of provisions increases in parallel with setting aside provisions in the course of the year, indicating that profitability criteria were taken into account.

The reports of the banks concerning coverage confirm that most of the time they require coverage in order to grant a credit. The ratio of coverage taken into account up to the value of the claim to the gross credit portfolio² was 78% at the level of the banking sector at the end of June 2000, that is to say, the ratio of unsecured loans accounted for 22%. At the same time, the coverage calculated at full value amounted to 170% of the credit portfolio.³

With regard to the composition of collateral (at full value), mortgage represents the highest share (39%), other collateral has a share of 18%, while the share of sales revenue assignment is 14% and the various guarantees together make up 12%. The role of mortgage can be regarded as excessive, as by far the greater part of the credit portfolio consists of corporate loans in the backing of which other types of collateral (e.g. assigning sales revenue) should represent a greater weight by virtue of the very nature of the business.

Relative to the end of 1998, both the share of secured credits and the average extent of cover-

	HUF millions		
Banking sector	31.12. 1998	30.06. 2000	Change
Coverage, collateral (at full value)	4,814,533	6,412,560	1,598,027
Coverage, collateral (up to the value of the claim)	2,173,212	2,923,337	750,125
Value of claims covered by letter of comfort	132,490	143,417	10,927
Credit portfolio (gross)	2,530,439	3,782,076	1,251,637
Coverage to value of claim/Gross credit portfolio	85.9%	77.3%	-8.6%
Coverage at full value/Gross credit portfolio	190.3%	169.6%	-20.7%
Comfort letter/Gross credit portfolio	5.2%	3.8%	-1.4%
Coverage, collateral (at full value)	100.0%	100.0%	0.0%
Cash coverage	3.4%	8.1%	4.8%
Mortgage	34.5%	38.7%	4.2%
Bank guarantees and cash payment guarantees	3.9%	7.6%	3.7%
Assignment of sales revenue and other claims	12.2%	15.1%	2.9%
Guarantees by the central budget or other public organisation	5.0%	4.7%	-0.3%
Securities	3.7%	1.6%	-2.1%
Pledge registered on stocks of commodities	6.6%	5.8%	-0.8%
Other	30.7%	18.3%	-12.4%

age decreased at the level of the banking sector, which was related more to the tightening of coverage valuation and the decrease in the share of lending exclusively on the basis of coverage than to a rise in the risk level of credits. As far as the composition of coverage is concerned, cash coverage, mortgage, bank guarantees and the assignment of sales revenue increased in weight, while other types of coverage declined.

1.3.3 The role of the management information system in the management of lending risk

Substantial differences were seen in the degree of sophistication of the management information systems applied by the banks under study. Nearly 30% of these banks have advanced MIS, while the number of banks where the management information system is in need of considerable improvement accounts for a similar share. It is a general tendency that the MIS applied by the banks established by foreign multinational banks are substantially more advanced than the systems of the privatised large banks but, in parallel with the gradual development of their IT systems, both the range of data contained in the management information systems of these banks and their quality improved significantly.

The management information systems applied by most banks require improvement, as the level of detail and frequency of the reports generated for management leave a lot to be desired in terms of presenting the utilisation of the statutory and the internal limits and the changes in the bank's total position. In the practices of most banks, management tends to review the assessment of the credit portfolio quarterly. Only a few banks exercise more intensive control, where the examination of the quality composition of the portfolio is part of the monthly assessment of business activities.

The IT backing of lending administration is generally good, although deficiencies were registered in the field of monitoring and rating off-balance sheet liabilities.

1.3.4 Internal audit

According to the Guidelines of the Basle Committee, an indispensable part of lending activity is the setting up of an internal audit system inde-

pendent of the business lines and which submits the results of its findings directly to the management. The task of the audit system is to monitor the process of lending administration, to review internal risk rates, to monitor the work performed by the staff members of the lending area and to report eventual deviations from the rules of lending or exceeding the limits to the management bodies of the bank.

In accordance with statutory provisions, all of the banks participating in the study had an organisation performing internal audit. Efficient internal audit work is being carried out at most of the banks, which extends to monitoring both the central areas and the branches. Over the past two years, compliance with the rules of lending was checked at every bank; internal audit carried out targeted audits in relation to lending as well as comprehensive audits. A deficiency that could be mentioned in this field is that only a few banks (primarily those held by foreign shareholders) harmonise the frequency and depth of internal audit with changes in the exposure of the portfolio to lending risk. The main shareholder tends to have a comprehensive audit every two years at the Hungarian subsidiaries of multinational banks; in addition, the number of special audits is of a frequency corresponding to the risks undertaken. The development of an internal monitoring system built into the procedures has not been given adequately strong emphasis at most of the banks, but with the entry into force of the relevant legislation its development is in progress.

II. Techniques of reducing lending risk and directions of development

In addition to employing the traditional lending risk management techniques, new development trends have evolved in the market. The instruments aimed at managing lending risk have become increasingly diverse, and new techniques and models are being applied. The new market techniques require the development of new, comprehensive methods for managing lending risk and their integration with market risks, which can be implemented by the portfo-

lio-level measurement and management of lending risk.

The basis of **portfolio-level lending risk management** (applied by nearly 40% of the banks) is a model-based approach, which applies techniques based on the probability of a delay in repayment and/or the use of a risk premium. Thus the risk weight of transactions genuinely reflects the actual weight of the lending risk in contrast to the capital requirements applied today; also the banks applying the model may determine their provisions for the entire portfolio and need not perform rating on a case-by-case basis. The development of an appropriate information base is indispensable for the efficient operation of the model.

According to the evidence of the survey, several banks are planning to introduce an integrated risk management system, which means the development of a risk management policy extending also to the members of the bank group. This handles the elements of risk occurring in the entire bank group as an integrated whole. One of the responding banks is developing a system that will enable the offsetting of a portfolio expansion in higher-risk sectors or companies with yield expectations, such that they be capable of neutralising eventual losses. In making their calculations, they assign the calculable costs which serve to cover the losses expected from the known risks of the company to the individual risk categories and model the possible dangers that may arise from unforeseeable, primarily world economic or sectoral business cycle changes.

In their responses, several banks stated that their objective was to redefine the division of work between the specialised areas linked to lending and, in parallel, to harmonise their existing lending rules. To reduce lending and operating risks, they intend to create an independent controller position to control the quality of loan

submissions and they are also developing an independent position to monitor the conditions and possibilities of disbursement in loan administration with a view to reinforcing the controlling function.

The use of software ensuring comprehensive analysis to map out the financial position of debtors is becoming increasingly necessary in daily practice. This independently performs debtor rating, although the members of the Lending Committee approving the loan make the decision on the final category. The continuous daily monitoring of the existing portfolio is effected on the basis of the software used by loan administration.

III. Assessment of exposure to lending risk and risk management among the individual banks

We attempted to assess the attitude of banks to lending risk, that is, we compared the exposure of individual banks to lending risk with the risk management system they used on the basis of the documents received from the banks and other information obtained from the reports. Based on narrative information concerning lending risk management, we evaluated the performance of the individual banks on a scale of 1–100 points bearing in mind the Basle Guidelines.⁴ According to the level of detail of the lending policy, the quality of regulations and of the lending risk management system, we divided the banks into four categories.

After this, we assessed the banks on the basis of the quality of their existing portfolios. We examined three ratios:

- the weighted ratio of the rated credit portfolio to the total credit portfolio;
- the ratio of the theoretical deficit in provisions⁵ to the net credit portfolio;
- the ratio of overdue credits to the total credit portfolio.

The ratios were evaluated by a maximum of 10 points each and the banks were divided into two groups on the basis of how the number of their points related to the average of the banking sector.

⁴ When awarding merit points, we assigned the greatest weight to the quality of lending practice and of the regulatory system related to lending at 40 points each, while we assigned a maximum of 20 points to the level of detail in lending policy.

⁵ Theoretical deficit in provision means the difference between the maximum amount of provisions and provisions actually set aside under the individual rating categories.

Number of banks/weight based on b/s total/weight based on corp. credit	Category I	Category II	Category III	Category IV
Group "a"	6	2	3	2
	28.5%	5.6%	9.7%	0.7%
Group "b"	35.4%	7.9%	10.2%	1.0%
	1	5	2	1
	3.8%	15.3%	2.3%	1.8%
	3.3%	18.2%	2.5%	2.6%

By evaluating the banks together along these two dimensions we obtained eight groups. The results are summarised in the table below:⁶

Category "I/a" includes the banks that are the least exposed to lending risk, that have rules developed in detail and an advanced risk management system, and whose exposure to risk is low.

Six of the credit institutions under study belong to this group; their weight in the banking sector based on their corporate credit portfolios is **35.4%**.

In the case of banks in Category "I/b", a high-standard risk management system is coupled with a credit portfolio quality short of the average of the banking sector.

There is only **one** bank in this category, whose share in the corporate credit portfolio of the banking sector is **3.3%**.

The majority of the banks in Categories "I/a,b" apply advanced regulatory and risk management systems either based on the experiences of, or taken over from the parent bank, which is, in principle, suitable for assessing the risk implied in the credit portfolio. They generally measure and manage lending risk by employing risk limits. The processes of decision support and credit monitoring are effected with adequate thoroughness, they have high-standard IT facilities and management information systems available to support lending decisions and to monitor changes taking place in the portfolio. The exposure of the banks in this category to lending risk and their share of rated credits are low and they aim at maintaining the quality of their portfolios.

The banks belonging to Category "II/a" are characterised by risk management supported with adequately developed lending rules; they continuously improve the procedures applied, which is manifested in the good quality of their portfolios.

The number of banks in this category is **two**, their weight based on their share in the corporate credit portfolio is **7.9%**.

Banks in Category "II/b" are characterised by a credit portfolio of a quality worse than the average of the banking sector, in spite of a risk management system of adequate standards.

There are **five** credit institutions in this group; their share in the corporate credit portfolio of the banking sector is **18.2%**. It should be noted that there are several banks in this category that have struggled with portfolio quality problems in recent years, as a result of which they have radically transformed their lending risk management systems.

The standards of the rules and lending risk management systems of the banks in Group "III/a", the accuracy and depth of measurement lag behind those of the banks in Group II and, although the quality of their portfolio shows a satisfactory picture for the time being, their exposure to lending risk is relatively high.

Three banks can be placed in this category. Their share based on the corporate credit portfolio is **10.2%**.

In the case of banks in Group "III/b", an underdeveloped system is coupled with a portfolio of a quality worse than the average of the banking sector, which may constitute a substantial risk factor.

There are **two** banks in this category; their share according to the corporate credit portfolio is **2.5%**.

⁶ The table shows the following figures:

- number of banks in the individual categories,
- the weight of the banks in the individual categories within the banking sector based on balance sheet total,
- the weight of the banks in the individual categories within the banking sector on the basis of corporate credit portfolios.

The risk management systems currently applied by the banks in Categories “IV/a” and “IV/b” are not suitable for the satisfactory assessment and quantification of risk factors.

There are **three** credit institutions in Group IV, whose share based on the corporate credit portfolio is **3.6%**.

Overall, it can be established that 14 credit institutions representing 64.8% of the corporate credit portfolio of the banking sector (Categories I and II) are characterised by high-standard lending risk management. Its consistent application and, naturally, continuous improvement provide an adequate basis for them for monitoring and limiting lending risks.

Eight credit institutions representing 16.3% of the credit portfolio of the banking sector (Categories III and IV) can be qualified as being “endangered” by lending risk, where unexpected, suddenly arising lending shocks may give rise even to significant losses. Perhaps the most important task for them is to rapidly improve their lending risk management. It should, however, be noted that the weight of the banks whose lending risk management is actually of a low standard is no more than 3.6%, which is negligible from the viewpoint of systemic risk. The management of lending risk by banks representing about 20% of the corporate credit portfolio that were not included

in the survey and whose lending risk management is not known may constitute more serious risk.

In summary, it may be established that the regulation of lending by the banks is in line with the relevant legal regulations. However, this is insufficient in itself for a bank to efficiently control and limit the process of risk taking and to pursue prudential lending practices.

It is a general characteristic of the banks that they assess the risks in individual credits with a sufficient degree of thoroughness only in the course of end-of-the-year rating, and deficiencies are present in the interim monitoring activity. Improvement is called for in lending risk management at portfolio level that takes into account stress situations as well.

According to the evidence of the documents received, the efficiency and standard of risk management depends first and foremost on the attitude of the management. The development of recommendations containing the best practice to be applied in valuing coverage (and provisioning) could improve the standard of lending risk management practice.

The banks' answers also shed light on deficiencies in legal regulations to this very day, as a result of which the effectiveness of creditor protection does not always meet the standard. This generates significant problems among the banks with respect to the feasible steps to be taken in the interest of reducing lending losses.

REGULATION OF NETTING IN HUNGARY

With a view to the development of Hungarian financial markets and closing the gap with the advanced western markets as soon as possible, it is necessary that netting by settlement and contract (or, to use another term, closing the position) which would ensure a more efficient enforcement of the collateral specified in contract, be appropriately regulated. One of the fundamental features of a competitive market is that the contracts concluded by market agents are performed and, in case of default, the parties holding the relevant rights are able to satisfy their claims quickly and efficiently from the collateral specified in contract. This requirement for reducing counterparty and settlement risk permeates money and capital markets even more, as transactions are concluded in these markets in particularly large volumes and values and, with the complicated multidirectional contracts between market agents, insolvency of even a single agent may give rise to system-level risk.

One of the recognised instruments of reducing counterparty and settlement risk is the institution of netting, whose application is by now widely recognised in the practices of western financial markets. The question has not arisen new, as the NBH initiated a reassuring solution to the legal regulation of netting as early as possible, already in 1998.

The concept and types of netting

There are several types of netting but, from the viewpoint of reducing settlement and counterparty risks, it is contractual (position closing) netting and settlement (multilateral) netting, which are of particular importance.

The heart of contractual netting is that in the case of a breach of contract, default or other similar “credit event” (one of the specific cases of which is a liquidation procedure initiated against the counterparty), all the contractual obligations outstanding between the parties become automatically due and payable, so that the parties in-

clude their claims outstanding against one another, that is, the claims are eliminated and the remaining difference is paid (in cash) by the party having less on claims to the other party. That is, at such times after the breach of contract (establishment of insolvency) the claim extends to no more than the difference outstanding after mutual inclusion. Through this, the security stipulated – when the legal/regulatory framework is appropriate – is able to fully satisfy the role of collateral specified in contract. (It is important to mention that a netting agreement is not a separate contract but always an accessory provision in a contract linked to the basic transaction or series of transactions, which constitutes a part of the basic contractual relationship between the parties.)

As part of the process of implementing European Union Directive 93/6/EC concerning capital adequacy in Hungary, a Government Decree on the introduction of the trading book defines the netting agreement as a provision reducing counterparty risk as follows:

“netting agreement: a provision in contract or separate agreement reducing the risk of default by the other party covered by collateral according to which

- a) the collateral can be enforced immediately and unconditionally,
- b) the legal basis of claims arising from specific financial operations is the same,
- c) claims are settled at market price during the period of the contract at specific intervals, and
- d) the obligation outstanding following settlement will thereafter consist in the new net amount;”

Netting upon settlement operates in a somewhat simpler manner than that described above, because there the parties participating in the settlement mutually have claims and debts against one another which they settle net. Here, therefore, there is no need for a separate default situation in order to set netting in motion.

Distinction between netting and inclusion

In defining netting, one of the important criteria is to make the appropriate distinction between netting and inclusion. Inclusion is an established institution in Hungarian civil law in contrast to netting, which is not currently regulated in the domestic legal system. There is no doubt that the two legal institutions contain a number of similar elements, but the two are not identical. Section 296 of the Civil Code provides for inclusion as follows:

“1. Unless an exception is provided for by law, the obligee may include his homogeneous and overdue claim outstanding against the obligor in his debt by a statement addressed to the obligor or made in the course of a court procedure.

2. Up to the amount of inclusion, the obligations cease.”

It follows that of the several differences between netting and inclusion perhaps the most important is that the enforceability of netting is not conditional upon the claim becoming overdue, as a claim that is not yet due becomes due precisely as a result of the event that gives rise to netting. The precise demarcation is also highly important because bankruptcy rules provide scope for inclusion only in a very limited range (Act on Bankruptcy, Section 36).

What are the arguments for introducing netting in Hungary?

Below we summarise the main reasons for regulating netting in Hungary as soon as possible:

- As a result of the wide-ranging application of netting, the settlement and counterparty risks in money and capital market transactions would be substantially reduced.
- By providing for a more favourable position for financial institutions and investment undertakings in enforcing collateral it would also indirectly reinforce the security of deposit holders and investors, that is, reduce systemic risks and, in relation to this, drive the quasi fiscal and fi-

nancial intermediation burden to a lower level.

- With the current regulation, foreign financial institutions are willing to conclude contracts with Hungarian undertakings only under more stringent security provisions; this renders transactions more expensive and constitutes a competitive disadvantage for the Hungarian party.
- Owing to the higher counterparty risks arising from current regulation, the counterparty limits applied in the Hungarian interbank market are much lower than usual, which greatly hinders the development of the market.
- The trading book-based capital requirement prescribed for investment service providers from 1 January 2001 could be greatly reduced owing to lower counterparty risks arising from netting. Through this, the capital costs of investment service providers would decrease, which presumably would also lead to lower transaction costs for their clients.
- The reports on Hungary of international financial institutions (IMF, World Bank) regularly mention the relative backlog observed in the field of enforcing contract collateral, particularly with respect to the bankruptcy rules in force.
- The Settlement Finality Directive (98/26/EC) of the European Union concerning the finality of performance in payment and security settlement systems sets forth that the collateral applied in the course of payment within the above-mentioned systems may not be affected by bankruptcy rules.

Domestic constraints to the enforcement of netting

It holds both for contract and settlement type netting that they can operate in full only when bankruptcy rules leave the contract collateral included in the settlement unaffected. Under the Hungarian legislation currently in force, the unconditional enforceability of the contract collat-

eral referred to is not guaranteed owing to the rules of the Bankruptcy Law. The contract netting rules referred to can operate in the current Hungarian legal system (“with immediate effect and unconditionally”) only so long as a liquidation situation does not arise at one of the contracting parties. In the case of liquidation, the assets transferred as collateral by the debtor (securities) will be included in the assets to be liquidated and any claim may be satisfied only under the liquidation procedure. Pursuant to Section 38 (5) of the Bankruptcy Law, when a debtor gives a pledge to secure an obligation prior to the date of the commencement of liquidation, the agreement concerning the pledge shall cease to have effect upon the announcement of liquidation and the assets constituting the subject of the pledge are to be issued to the liquidator.

It can therefore be established that under the current legislation, netting cannot fulfil its original function precisely in the situation when the obligee is the most exposed. It can be easily seen that this is a substantial problem not only at the level of the given institution but may give rise to intensive systemic risk arising from the situation of the market agents active in the system of financial intermediation.

It follows that the Bankruptcy Law should be modified so that the institution of netting be suitable for reducing settlement and counterparty risks under all conditions.

Having recognised this need, in virtually every one of the Member States of the European Union the bankruptcy rules, which had earlier been regarded as untouchable, were modified so that the settlements arising as a result of netting applied in financial markets cannot be questioned in the course of liquidation procedures.

Provisions currently in force preventing the enforcement of netting

The unconditional enforcement of contractual netting is prevented by certain rules in the Bankruptcy Law summarised below.

In the course of contractual netting, claims are directly satisfied “as if by pledge”. In Hungarian civil law, pledge is the only type of security

that enables the obligee to satisfy himself directly:

Civil Code, Section 270 (1): “When a pledge is given to secure an obligation, the obligee may directly satisfy his claim in the case of non-performance of the contract or its performance not in accordance with the contract.”

That is to say, the function of the pledge is that when the obligor is unable or unwilling to perform according to contract, the pledge transferred to the obligee provides coverage for this case, even without having to resort to the process of distraint. However, under the rules of the Hungarian Bankruptcy Law, this direct security function of the pledge mentioned above cannot operate in the case of an eventual liquidation situation. One of the fundamental principles of regulation in Hungarian Bankruptcy Law is the protection of assets under bankruptcy or liquidation, that is, a creditor may be satisfied only in the framework of a liquidation procedure. The obligee must issue the pledge upon the commencement of the liquidation procedure to the liquidator, which will then be included in the assets to be liquidated.¹ Nevertheless, the pledge still provides a preference to the obligee in the sense that it takes precedence in the order of satisfaction over the unsecured claims but the costs of liquidation take precedence over the claims secured by pledge, that is to say, it is not certain that there will be a sufficient amount to cover its satisfaction.

In addition, another important rule of the Bankruptcy Law is that a claim qualifies as secured by pledge only when the provision concerning the pledge preceded the commencement of the liquidation procedure by at least 6 months. Otherwise, the liquidator includes it only under other claims. The 6-month period is exceedingly long in relation to financial transactions. In actual fact the application of the above rule to date makes any pledge specified within 6 months practically worthless.

Having recognised this, to more efficiently enforce contractual securities, the Ministry of Justice initiated the amendment of the provisions

¹ This provision no longer applies to the pledge (cover) given in payment and security settlement systems specified by law from 1 September 2001.

of the Civil Code concerning lien already in 2000, which affected bankruptcy rules as well in some of its items. According to the amendment entering into force on 1 September 2001, the 6-month limitation on enforcing collateral referred to in the present Bankruptcy Law will cease.

Another much disputed but still prevailing provision in the Hungarian Bankruptcy Law (Bankruptcy Law, Section 40) is the right of the liquidator to contest a contract or other legal statement of the debtor made within a year of the commencement of the liquidation procedure and thereafter, provided that its subject is

- disposal of the assets of the debtor free of charge, or a commitment to debit the assets free of charge, or
- a commutative legal transaction concluded in favour of a third party with strikingly disproportionate difference in value,
- any other legal transaction reducing the assets of the debtor that serves the deception of the creditor or creditors.

This provision gives the liquidator wide-ranging rights to contest a contract or other legal statement, which again renders the position of market agents more difficult in reducing counterparty risk through contractual provisions.

Work in progress in Hungary concerning netting

The NBH and the representatives of market agents have agreed in the course of professional exchanges that the issue of position closing netting should be regulated in Hungary, that is, the enforceability of contract securities should be less restricted through the rules of bankruptcy

law and thereby individual financial transactions applied by money and capital market agents should be made more secure.

This means that the legal concept of netting must be created together with its fundamental rules and it must be inserted in a legal regulation. It will also be necessary to annul the provisions of the Bankruptcy Law hindering the enforcement of netting.

This means that in the course of regulating netting particular consideration should be given to where exactly, that is, in which piece of legislation, the concrete provisions should be incorporated.

Concerning the issue of regulating netting, the NBH maintains constant contact with the Ministry of Finance in charge of the technical rules of bankruptcy regulation and the Ministry of Justice. The development of the concepts and the drafting of the concrete texts of the recommendations are already in progress, as a result of which the bill to amend the law will hopefully be submitted to Parliament in 2001.

In addition to having the European regulations concerning contract netting recognised in Hungary, attention should also be paid to institutionalising settlement finality concerning payment and settlement systems, as indirectly the two sets of problems are interrelated. Settlement finality relates to the problems discussed above so that the netting applied within the payment and security settlement systems and the coverage backing that settlement should also not be affected by bankruptcy procedure. Such a comprehensive recommendation to regulate netting could be linked to harmonising Hungarian laws with the requirements of the Settlement Finality Directive (98/26/EC) concerning the finality of payments and security settlements.

ELECTRONIC BANKING SERVICES IN HUNGARY

1 Introduction

With the increasingly intensive competition among the banks and the rapid development of information technology, electronic banking services began to experience dynamic growth from the mid-1990s. They include all the services which clients can make use of without visiting the branch through various channels of communication and, as a consequence, money and data are exchanged electronically between the bank and the client. Although these sales channels enable a much easier, faster and more convenient banking, for the time being banks offer a much more limited range of services than those available in the branches.

In contrast to traditional banking services, electronic banking services are of importance for clients primarily for reasons of convenience, as they do not need to go to the branch to perform certain transactions. They enable flexible means of finding information concerning the products and conditions offered, and provide non-stop services seven days a week, 24 hours a day. Another aspect not to be neglected is the question of price, as banks let clients have some of the cost savings through offering certain electronic services at prices lower than what they charge for the same service employed at a branch.

From the viewpoint of the banks, the advantages of electronic banking services are manifested primarily in the improved efficiency of operations and in the possibility of expanding client relations. International experience indicates that the use of electronic channels is substantially cheaper than the branch in the case of cost sensitive products and business lines.¹ In addition to improving efficiency, the fundamental question for any bank is whether the development of electronic sales channels that can be established through major investments would expand the number of their clients and increase their turnover. An appropriate IT background enables a bank to obtain a picture of the habits of its clients, the products and services of the greatest rele-

vance to them, the consumer groups using the electronic channel and their composition. This may enable the bank to compile a product range that is best suited to the demands of its customers, to acquire new, profitable customers and to maintain its already existing clientele.

According to analysts, Internet applications have the impact providing the largest momentum in financial intermediation. A form of appearance of this is e-business, which uses the Internet as its sales channel. Business processes become comprehensive when not only placement of an order, but also payment is effected in the same way. Thus banks enter e-business almost by necessity, as they have all the conditions required.

The practical use of the results of technological development, however, gives rise to a number of problems, which need not be faced in traditional business life. The new channels of communications and sales – particularly the Internet – eliminate the person-to-person relationships, which are of major importance in business life and, consequently, new problems of a different nature arise.

The Hungarian legal and regulatory environment fails in several respects to provide adequate security to the providers and users of electronic banking services. Although a government decree on electronic banking services is already in place, a number of laws, primarily those concerning the use of the Internet and, in relation to this, the identification of the client, are still in a preparatory phase. Taking international tendencies into account, the supervisory authority must also be prepared to monitor the risk management practices of the banks arising in relation to providing electronic banking services.

¹ According to a survey by the international financial consultants Booz-Allen & Hamilton carried out in March 1996 among North American and European banks, while the cost of a service provided in an office in the traditional way is 1 dollar, the same transaction cost will be 54 cents when the case is administered by phone, 26 cents in the case of a PC service requiring the bank's software and no more than 13 cents through the Internet.

2 The development and types of electronic banking services

Similar to tendencies abroad, the Hungarian actors of the financial sector have also recognised the opportunities offered by electronic banking services. As a result, there are about 30 commercial banks in the Hungarian market that offer one or more electronically available service to their clients. An assessment of the market or a comparison with international tendencies is, however, made very difficult by the fact that there is very little information available on the magnitude of the turnover administered through electronic banking channels, on the number of clients using these services and the impact of these services on the banks' profitability, both in Hungary and internationally. With respect to these, analysts tend to rely only on estimates or the surveys carried out by certain research institutes.

At first, the primary field of development in electronic banking services was the market of bankcards and the products offered to undertakings in Hungary. Initially, the issuing of bankcards was concentrated among only a few banks aimed primarily at reducing cash payments. In the corporate market, the primary criterion was to modernise, speed up and improve the quality of payments, and to put banking relations of companies on an electronic footing.

By the mid-nineties, the division of the corporate market came to an end; it was no longer possible to expect any growth of merit in the market of corporate accounts. Hence, in the midst of keen competition, banks' attention turned towards the household market. More and more of them recognised that retail banking was the area where the development of technology could be used with the highest degree of efficiency, as here they could sell standardised products and services in large volumes. Consequently, the number of market agents, and the choice and volume of products offered increased equally dynamically. Account management linked to cards appeared as a possibility with more and more banks, and services available through PCs or phone began to spread. Moreover, the possibility of administering bank-

ing affairs through a mobile phone or the Internet also emerged. Consequently, some 57% of payments administered through the forint accounts of the clients of credit institutions took place electronically in 2000.

As far as payment services are concerned, the objectives of NBH include curbing the use of cash, facilitating the spread of cash substitutes and improving the quality of cashless payment services. The role of licensing is continuously declining in payments in line with the fact that the central bank no longer intends to maintain its licensing authority related to the issue of means of cashless payments and cash transfers. Through reducing the former official functions and licensing powers of the central bank, a new integrator function is gaining ground in regulation, reflecting the fact that regulation is no longer regarded as an instrument of the central will but much more as an intermediary channel of public interest or consensus.²

2.1 Electronic services available through cards

The appearance of bankcards enabled the electronic administration of a portion of cash payments among the branches. Early in the 1990s, bank branches had a monopoly in cash withdrawal and cash payments; this, however, was done away with by the gradual spreading of ATMs and POS terminals enabling the use of bankcards. Bankcards, however, can be used not only to withdraw cash or to pay in commercial transactions, they can also be used to execute other transactions that can be administered electronically. With most of the banks, a card number supplemented with various codes is also used to identify the client, through which it is possible, *inter alia*, to effect transfers by phone or to use home banking services.

The past decade saw highly significant developments in the Hungarian card markets with respect to the number of cards issued, the turnover administered by them as well as the possibilities of their use. Today, there are over 4 mil-

² A pénz- és elszámolásforgalom helyzete, továbbfejlesztésének jegybanki koncepciója (Position of payments and settlements, the central bank's conception for their improvement) NBH Budapest, March 27, 2000.

lion cards in circulation administering over Ft1,600 billion in turnover. Some 82% of the bankcards in circulation in Hungary function exclusively in an electronic environment.

Until the middle of the decade, bankcards could be used in a very restricted field: most of the cards were suitable for cash withdrawal only.³ Today, 97% of the bankcards in circulation are suitable for both cash withdrawal and purchases, yet turnover data indicate that their use for cash withdrawal is still more popular inland than payment using them. In the first half of 2000, cash withdrawal accounted for 80% of transactions and 91% of their value.

In addition to the slow change in the habits of consumers, the fact that relative to the number of retail units,⁴ the number of merchants accepting cards and the number of POS terminals installed at the merchants is still low, which also plays a role in the low share of payments by cards. By the middle of the year, the number of retail units accepting cards was 22,262, and 21,000 POS terminals and 10,500 imprinters operated in the country ensuring electronic card acceptance.⁵ Although at present 23 commercial banks are involved in the card business, three-quarters of the contracts concluded with merchants having POS terminals are concentrated among three banks.

In the long term, the banks' turnover could be substantially increased through managing payments in e-commerce administered through the Internet. According to a survey by Carnation Research,⁶ the share of Internet shops enabling payment using bankcards is still very low in Hungary: at the end of 1999, only about 10% of payments in e-retail was administered using cards. By far the greater part of these cards are still the traditional magnetic stripe cards, but the virtual bankcard, which is more secure when used for purchases through the Internet, can also be found in the offers of a few banks.

2.2 Office/home banking services

Office/home banking is an electronic banking service through which the client can access the bank's services from his own PC. This requires a computer, software operating the system (pro-

vided by the bank) and a modem. The client is linked to the bank's front-end system through a phone line, and through it to the bank's account management system. The service provided by the bank is fully electronic.

The market makes a distinction between the office banking systems used by corporate customers and the home banking systems used by households or small businesses. Office banking provides a high-standard service primarily to the priority large companies, while home banking services are available to the priority private customers of the banks. To run the system, some of the banks use a program of their own development, while others resort to internationally widespread programs, such as MultiCash or Spektra. The choice of the services provided by the systems of individual banks is relatively even; we find differences largely in the field of special services.

Apart from a few small banks, today virtually every bank enables its corporate customers to use the office banking service. The range of banks offering home banking services to households is narrower than this: currently 15 banks offer this service, five of them also through the Internet. No data are available on the number of customers using the home banking service; presumably, however, this service is used by only a relative few owing to the absence of the necessary infrastructure and low income levels.

The future of the office/home banking service definitely points towards banking services via the Internet. With the Internet, users have no need of a separate program provided by the bank, only a browser; important data are stored not in the computer of the user but in the bank's server; and there is also no need for the cus-

³ In 1995, 32% of the cards used inland were suitable for cash withdrawal only and the share of cards equally suitable for purchase and cash withdrawal accented for 33%. The share of cards issued under the banks' own logos was 35%, a substantial portion of which could again be used only to withdraw cash..

⁴ According to preliminary CSO data, 150,000 retail units were registered at the end of 1999. Of these, the number of units run by proprietary businesses was 73,000.

⁵ The number of places of acceptance is presumably less than that presented by statistics, as, say, a department store may have contracts with several banks, which appears as several places of acceptance in the statistics.

⁶ http://www.carnationresearch.hu/sajt_00feb17.html

tomer's own computer because transactions can be launched from any PC anywhere.

Provided that the security of transactions can be guaranteed, the Internet will be able to supply the same clientele as office/home banking. It reduces the banks' costs and enables them to reach a greater clientele and to offer novel services.

2.3 Telebanking, mobile banking services

Similarly to the home banking services, the banking services available through the phone could also be found among the products of Hungarian banks for the past few years. Currently, 16 banks offer services of this kind available from most of them for both corporate and retail customers.

Through the telebanking service, basic information – offer of products and services, current interest rates, fees, charges, exchange rates, etc. – are accessible to anyone. In addition to providing general information, customers who have their accounts with the bank are able to administer transactions (e.g. querying account balance or amount limits, concluding insurance, launching transfers, fixing deposits, blacklisting cards, etc.). A number of supplementary services are linked to telebanking services, such as a fax service or call centre. In the case of a fax service, the phone banking system sends the required information to the fax number keyed in by phone. The call-centre generally functions within the phone bank and not only executes orders but also gives advice to the client. A few banks also provide independent, live phone services to their customers in addition to telebanking.

The scope of services differs from bank to bank: there are some, which only enable the provision of information, while other banks enable the administration of actual transactions. Experience shows that customers tend to use

telebanking services largely to request information about the balance in their accounts.

Cellular phones can be used for banking services practically the same way as the traditional fixed-line phone, with the only difference being that through a cellular phone both the customer and the bank can communicate with one another with the help of SMSs. Today, seven banks offer such services in Hungary.

By sending an SMS⁷ customers may query their daily balance, turnover, exchange rates, stock exchange information, may launch transactions, etc.

The information requested by the customer is also received by the cellular phone in the form of an SMS. Some banks automatically transmit an SMS detailing the transactions administered through on-line equipment (ATM cash withdrawal, payment via POS terminal) effected by cards to the phone of the customer. To date, this has been the best and fastest instrument of preventing and exposing unauthorised card use.

According to experts, among the electronic sales channels mobile banking has a substantial growth potential, because the number of subscribers to cellular phone services has increased by leaps and bounds in recent years. In the middle of last year, the share of cellular phone subscribers exceeded 21% of the population. According to a Kopint-Datorg survey, SMS leads the way by far in terms of the utilisation of cellular phone services used by 70% of subscribers; one tenth of them send and receive e-mails, 8% also use their phones abroad, 5–6% use them for sending fax messages, while the utilisation of WAP⁸ is 2%.

In the domestic market, there are two banks that provide WAP content services enabling customers to obtain financial information at both banks.

2.4 Internet

Of the electronic sales channels, Internet-based access to the banks is regarded as the most promising. By now, 55% of the banks of the European Union and 15% of the financial institutions of the United States offer on-line services through the Internet.⁹

⁷ Short Message Service, a cellular phone service enabling the sending and reception of short texts.

⁸ This is the standard for wireless data transmission available through the newest cellular phones and small "palm computers"; it provides interactive content and other internet services similarly to the web. It is not suitable for presenting longer texts or sophisticated graphics; rather it facilitates the rapid finding of information.

⁹ Naturally, when making the comparison one should not disregard the differences between the banking systems and the number of banks.

It is increasingly manifest that Hungarian banks are also attempting to reach their customers more and more through the Internet, which is well indicated by the fact that there are now 19 banks that have Internet websites. According to a June 2000 study by Carnation Research, 71% of the banks operating in Hungary have already launched Internet banking programmes resulting in substantial growth in 2001, as most of the projects will then arrive at the phase of implementation.

For the time being, the websites of the majority of the banks are used only to present their products, the banks themselves and their subsidiaries, to list their branches and ATMs, to publish lists of conditions, exchange rates, etc. Currently, five Hungarian banks offer Internet services. A bank account is a precondition for using any banking operation, and all the five banks offer the related service free of charge. For the time being, the customer must visit the bank personally to conclude a contract but, once the Bill on Electronic Signature is adopted, presumably this step will no longer be needed.

The basic services are available everywhere, in addition, some banks provide an opportunity to initiate, say, borrowing, to implement deposit transactions, or to ask for messages received by cellular phones. Two banks also enable the implementation of active stock exchange transactions. Here they may expect keen competition – primarily price competition – not only from other banks but also from the Internet brokerage companies not backed by banks. For the time being, there is no lending activity through the Internet. Loan application forms can be downloaded but, to conclude a contract, it is necessary to visit a bank in person.

The rapid spread of trade through the Internet will sooner or later force banks to offer lending, which may be implemented first in consumer lending.

Although the range and number of services implemented through the Internet is still very low in the domestic market, both the number of customers using these services and the choice of transactions available have been continuously increasing. Whereas in August 1999, Internet banking services could boast of 3,100 registered users, by December 1999, their number had in-

creased to 10,000, and by the end of 2000 some 50,000 Internet contracts were registered (*Bank és Tőzsde* supplement, November 2000).

Owing to the standard instruments and solutions applied, the Internet is available primarily to households and small businesses. Although some of the banks providing Internet-based services also offer their products to their corporate customers, (moreover, there are banks among those intending to enter this market, which expressly aim at this clientele), it will be possible to administer serious, large-amount transactions in a wide range only once the appropriate regulatory, legal and security environment is in place.

The widespread use of the Internet in the Hungarian market depends on a number of factors:

- whether the banks will be able to establish the necessary technological background,
- how user demand will evolve (number of PCs, number of Internet subscribers, changes in subscription fees),
- whether the appropriate legal framework and guarantees of security will be in place.

In view of the IT development programmes of the banks, it seems that the banks are doing everything in their power to spread Internet services; the growth in consumer demand and inter-bank competition is forcing them to develop. A bank that is unable to compete in this field may lose a substantial market.

The bottleneck in spreading such services is due to the availability of PCs (only 15% of households have a computer at home) and high Internet subscription fees.

Currently, some 6–7% of households have Internet access. Hungary's backlog in terms of Internet use relative to the west European countries is still substantial, as the number of regular Internet users in Hungary can be estimated at no more than 2.5–3%. (In the autumn of 1999 the percentage of Internet users was 12% in Germany and France, and 9% in Spain – these coun-

tries are slightly behind the European vanguard.¹⁰⁾

The potential market is therefore large, particularly in view of the fact that a portion of Internet subscribers belong to higher income categories today or are young people who may have substantial purchasing power in the future.

3 Conditions of providing electronic banking services

3.1 The legal environment of electronic banking services

Although electronic banking services are spreading dynamically in the domestic banking sector and the range of participants in e-commerce is expanding, the special rules regulating on-line relations with customers are not yet in place in the Hungarian legal system. Another problem is that existing legal regulations do not constitute a uniform system; there are legal loopholes in some areas, while elsewhere regulations are contradictory.

Of the legal regulations applicable to financial institutions, the Act on Credit Institutions and Government Decree 77/1999 concerning the issue and use of electronic means of payment are worth mentioning. The Act on Credit Institutions specifies the legal form in which financial services can be provided, while the government decree regulates the payment and cash withdrawal operations performed using electronic means of payment, as well as the relationship between the issuer and the holder of the electronic means of payment.

Under the Act on Credit Institutions, when an already operational bank wishes to add a new form of service to its range of activities, it then has to modify its rules of business and general conditions of contract. When a bank intends to set up its own Internet subsidiary, pursuant to the Act, the subsidiary may provide the service only as an agent and may not in actual fact partic-

ipate in the financial or investment service. Differently from practices in other countries, Internet-only companies specialised exclusively in on-line services cannot yet come into being, as this is not made possible by the legal regulations in force.

According to the provisions of the Act on Credit Institutions, financial and investment services may be provided only pursuant to a written contract concluded with the customer, that is, the company must personally identify the customer. This is reinforced by the Government Decree referred to, as well as Government Decree 17/1999 concerning contracts concluded between remote parties whose effect does not extend to contracts related to financial and supplementary financial services.

Under these rules, it is obvious that a “purely Internet-based” financial activity can be performed only when legal regulations recognise electronic documents as a written contract. This requires the enactment of the laws on electronic signature and the acceptance of the electronic document harmonised with EU directives. Although Government Resolution 1075/2000 (IX.13) provides for the regulatory principles of the Bill on Electronic Signature and the measures to be taken in relation to this, the bill has not yet been drafted, even though its due date was 31 October 2000.¹¹ The due date for drafting the provisions concerning the archivation of electronic documents and the encryption of the content of documents, which are closely related to the Bill on Electronic Signature, is 31 May 2001.

Although the electronic signature as technology is already there, the presumption of authenticity is not yet linked to it, owing to the absence of legal regulation. At present, the courts may take into consideration the force of such documents as evidence in an eventual legal dispute. The banks’ practice today is that they conclude the first contract in the traditional form with the customer and then agree that additional communication between them would take place in an electronic form.

The Hungarian legal system does not yet regulate the issues of liability arising in the course of Internet services in detail and there are no interpreting analogies similar to EU legislation. Directive 31/2000/EC concerning certain

¹⁰ As a percentage of the total population. Jobbágy S.: *Merre vagy Európa?* (Whereabouts are you, Europe?) in: *Pénz a hálón* (Money in the net) Bank és Tőzsde special edition 2000/1. pp.24–25.

¹¹ In the meantime, the due date of 31 October 2000 was modified to 28 February 2001.

legal aspects of information society services – in particular electronic commerce – introduce the concept of “mere intermediation”, according to which Internet service providers including access providers are not liable for the content mediated by them when it is not them who initiate data transmission and have no control over who the data reach, and when it is not them who determine or modify the mediated content. As currently no legal regulation covers the liability of Internet service providers, banks offering Internet-based services attempt to regulate and limit their liability in their conditions of contract in detail.

The sale of financial products through the Internet raises the issue of regulating transborder services. In the current situation, customers will have to calculate with the fact that they have to seek legal remedy at the judicial authorities of the country of the counterparty participating in e-trade, should any problem arise. This is one of the greatest risks in transborder e-commerce, as well as in electronic banking services.

3.2 Technological and IT background

In order for a bank to be able to provide comprehensive electronic services satisfying its customers' needs, first and foremost it must have advanced computer, information and security technological backing. The Y2K problem gave a substantial momentum to the acceleration of the banks' development projects in progress, in relation to which several banks reviewed their IT systems and replaced or renewed their channels of communication as needed.

Generally, three fundamental functions are distinguished in the IT system of a bank. The task of the first basic function is to receive transactions arriving from customers through various IT systems. The second basic function is the processing of transactions grouped according to a specific business logic determined fundamentally by the type of the bank's product. Individual groups require different processing, hence these are generally implemented using separate systems. The third function is to support the bank's decision-making by the up-to-date processing of the data collected from the different systems. Integration is a fundamental requirement for the IT

system of a bank, as a transaction generally transgresses the borders of individual systems. We can speak about the highest-level integration when a transaction implemented in one system immediately modifies the relevant data of the other systems as well.

At present, the IT systems of Hungarian banks are very different, consequently, some banks offer only one or two types of electronic services. Yet there are several banks with the ability to offer the full scale of services.

As to IT backing, the banks present for a long time in the banking sector or those foreign-held banks which entered the market early in the 1990s are in a substantially better position than Hungarian-owned banks. The shareholders of these banks well equipped with capital supplied the capital required for computerisation and IT development projects for their subsidiaries already upon start-up and enabled them to use the state-of-the-art technology already implemented by the parent bank in the field of electronic banking services.

Although the majority of Hungarian banks launched highly intensive IT development programmes, and an information system is in place for every one of them, there are still a number of banks – in spite of their continuous development efforts absorbing substantial costs – which still do not have an integrated IT system; the computer coverage of all areas and fields of activity are not yet guaranteed. This is a source of major losses, which slows down the expansion of the sales channels of new products and services, and gives rise to difficulties in the field of collecting data within the bank and reporting outside the bank. (In the case of one large bank, for instance, the fact that an on-line link between the system authorising and recording bankcard transactions and the account management system was not yet in place provided an opportunity for customer abuse and caused considerable losses in 1999.)

3.3 Share in account management

A bank's achievable share in the market of electronic banking services is greatly influenced, in addition to its technological and IT preparation, by the market position of the bank in account

management. The precondition of making use of most electronic banking services is that the customer has a current account or a bank account with the given bank.¹² Banks regard account management not only as the basis of establishing and expanding their clientele enabling them to have access to cheaper funds, it also assists in moderating client risk as the payment turnover of the customers can be monitored and it also provides an opportunity for the harmonised sale of individual products.

Although over the past ten years the concentration of the account portfolio declined, it can still be regarded as rather high. The share of the banks in the market of corporate payment accounts is more balanced than in the market of household current accounts.

At the end of 1999, there were 1,017,000 registered business organisations in Hungary, the number of those actually operating being 774,000. At the same time, commercial banks managed 820,000 payment accounts for business organisations resident according to foreign exchange regulations and individual entrepreneurs subject to the obligation to open accounts. As the growth rate in the number of business organisations has declined continuously over the past few years, no significant expansion in the market of payment account management could be expected.

By far the greater part of transactions administered with business organisations is already administered electronically. We, however, expect that the sales channels will be gradually shifted from the traditional office banking to the Internet. After that, it will only be the security and price of services that will influence changes in the market shares of individual banks.

The situation is different in the market of household account management, because at the end of 1999, the number of forint bank accounts managed for retail clients was 5 million, that is, the number of potential customers continues to be significant. In this segment, those banks are able to grow substantially that are able to win over wide groups of customers, apply account management conditions more favourable than

those of their competitors and offer more supplementary services linked to account management.

3.4 Security

As there is no personal relationship between the bank and its customer in electronic banking services, the issue of security is of the utmost importance. In this respect, there are two fundamental requirements: establishment of secure data transmission and the issue of the identification of the parties to a transaction. It is the customers' most fundamental requirement that nobody apart from themselves be able to launch a transaction from their accounts, that unauthorised persons be prevented from obtaining information about the turnover of their accounts and from accessing their personal data. From the viewpoint of the banks, the essential issue is that an unauthorised person should have no access to the database of the bank and should not be able to administer transactions from the accounts of its customers or from the internal accounts of the bank.

When a bank provides electronic banking services, it must enable access to its internal network from outside the bank. Such are, for instance, requests for authorisation by ATMs and merchants' POS terminals or customer access through office or home banking. These links are established between two specific fixed points. Banks apply different solutions to identify the customer depending on the form of electronic service concerned. In the case of ATM transactions, it generally suffices to use a four-digit PIN code (personal identification number); in the case of phone banking, the role of the PIN code is taken over generally by the account number or the card number and a special phone code. The office/home banking service can be accessed through a multilevel security system. Messages between the bank and the customer are encrypted whose key is generally based on the password issued by the system to the authorised person. Corporate users tend to communicate with the bank's system through the leased lines that can be regarded as secure. In addition, to start up the software provided by the bank, a separate password, signature disc or key disc are re-

¹² There are only a few exceptions from this rule, e.g. in the case of the Citibank credit card, which suffices for the customer to verify his income or, short of this, to place a large amount in pledge.

quired and various level authorisations are also incorporated in the program. The home banking services offered to household users function according to similar principles.

The security of transactions carried out using traditional bankcards and of orders issued through call centres can be regarded as of relatively high risk. When a card is lost or stolen, the data of the magnetic stripe containing the identification information of the client can easily be decrypted by computer creating a great deal of opportunity for abuse. The initial period was marked by a relatively high volume of bankcard fraud. By now, however, the security of payments by cards has improved greatly. The ratio as well as the value of abuse relative to turnover has declined. At the same time, the value per case has increased. The security of transactions carried out through the public phone network is endangered by the fact that the technology for intercepting phone calls is cheaply available and does not require particularly high skills.

In order to protect their good reputation, banks generally do not disclose to the public when somebody evades their security systems; because of this, very few abuses have come to the light. Recently, however, a newspaper article reported that in the course of a bank security test the computer experts of a company held by the state managed to break into the security system of the server of a large domestic bank and initiated unauthorised money transfers with the knowledge of the bank. For this they required nothing more than the installation disc produced for customers subscribing to the home banking service.

Among the electronic sales channels the Internet constitutes a completely different channel of communication, whose risks differ materially from those referred to above: transactions between computers proceed along routes which are not determined in advance and today anybody may establish a website on the Internet and obtain an electronic mailing address without having to identify himself or to verify his personal identification in an authentic manner. In the case of the Internet – in contrast to traditional sales channels – the establishment of liability for abuse is not unambiguous. Therefore, the banks

tend to shift any damage that may occur onto their customers in their bilateral contracts.

To use the services administered through the Internet, some kind of code, username or secret password serve to identify the customer. One of the essential elements of preventing unauthorised access to the banks' databases is firewall protection, which separates the internal network of a bank from the public network. The firewall is normally located at the point where the bank's data network is connected to the public phone network or the Internet. The firewall is an instrument used exclusively for this purpose; it monitors incoming connections, records them for subsequent audit and does not permit unauthorised communications to reach the internal network. In addition, there are a number of security applications based on available technical standards, which may significantly decrease the dangers that can arise in the course of electronic banking. Such a group of standards is, for instance, SET,¹³ whose development was initiated by international card companies for card-based electronic services or SSL,¹⁴ the most frequently used encrypting procedure, which guarantees encrypted data flow between the computers of the user and the service provider.

In relation to the Internet, the issue of the security of commercial transactions administered through it deserve special mention. For the banks participating in e-commerce, the performance of payment orders between buyer and seller may pose risks, as the identity of the person issuing the payment order may be uncertain. This risk can be substantially reduced by applying the virtual bankcards that may be used for buying through the Internet. Currently there are two banks offering these to their customers. With the help of the virtual card, the holder may buy in all of the shops available on the Internet. Upon the commencement of the purchase, the merchant monitors coverage at the bank of the customer. In the course of administration, the card number of the customer is not put on the Internet, hence nobody else can obtain it. The

¹³ Secure Electronic Transaction security standard for the administration of bankcard-based transactions through a public network.

¹⁴ Secure Socket Layer, SSL establishes secure communication contact by using open codes. This is the security technology applied to encrypt and authenticate data in the data transmission between the web server and the web browser.

use of the card, however, requires that the merchant's bank use the electronic commerce identifier, as without it the buyer's bank does not permit payment with the virtual card, even though there may be sufficient coverage in the account. The issuer bank must be certain that the purchase was administered through the Internet. In addition, the security of the transaction may be guaranteed by linking purchase in the Internet with messages sent to a cellular phone. This means that the Internet transaction appearing on the screen of the phone will be credited only when approved by the customer.

4 Risks and supervision of electronic banking services

In view of the fact that IT instruments and services are incorporated into the banks' procedures, the irregular operation of these services may threaten the prudential operation of financial institutions. With the development of technology, the basic types of risks affecting the operation of the banks have not changed in substance, but certain risks have become more significant. With respect to electronic banking services, it is first and foremost the legal risk and the risks affecting operations reputation, which are of particular importance to the banks. Some problems may affect several risk categories, for instance, a breach of security rules may result in unauthorised access for the customer, which basically appears as a risk of operation but, in terms of its consequences, it may constitute a legal risk and a risk of compromising the bank's good reputation.

Traditional banking risks (lending, liquidity, market risk) also arise in the case of electronic banking services, but their practical consequences and effects are different from those already mentioned. The above mentioned risks may appear primarily among the institutions that issue electronic money but, for instance, lending risk must also be taken into account in the case of transborder services, when the assessment of the creditworthiness of applicants may constitute a genuine problem in the absence of proper knowledge of the situation.

¹⁵ Electronic Banking Group Initiatives and White Papers, Basle Committee for Banking Supervision, Basle October 2000.

A crucial issue in the management of risks arising in electronic banking services is the development of the appropriate supervisory, regulatory and control environment. A group dealing with electronic banking activities has already been set up within the Basle Committee for Banking Supervision,¹⁵ whose task is to draw up guidelines for the supervisory authorities in relation to the supervision of electronic banking activities. The Committee regards it as necessary to develop supervisory guidelines to be applied in the field of transborder electronic banking services, which it intends to do together with the bank supervisory authorities and the banks themselves, and to review the existing guidelines in relation to risks of operation, through which the steps in risk management are prescribed for supervisory authorities and banks so that they be unambiguous and controllable. At present, the supervisory control of electronic banking services abroad is essentially aimed at the ways and means of managing the operational, legal and reputation risks already referred to. The supervisory authorities obtain a picture of the risk management practices of the banks partly through onsite audits and partly on the basis of questionnaires. Within this, they study the documents related to security policy and security measures, examining them as to whether they meet the expected requirements and how they are applied in practice. They expect to find the appropriate verification (audit) of IT systems and the existence of contingency plans so as to be able to maintain services even in the case of breakdowns, particularly in the case of time-sensitive information and value-carrying transactions.

The American Federal Deposit Insurance Corporation (FDIC) has developed procedures to examine the security and compliance of electronic banking services in accordance with the degree of risk in the given electronic channel. Their control extends to the design and implementation of electronic banking services, policies and procedures related to operation including risk assessment, the security framework system, the division of powers and responsibilities, the training of employees as well as development programmes. Apart from these, they also examine the internal audit, the audit programme developed by the institution as well as records of

activities related to electronic systems, because it is on that basis that the various interventions in the system can be tracked.

In Hungarian practice, a great many legal regulations deal with information technology and the related issues of control. However, the various laws and regulations tend to contain only general principles and requirements, which renders the control and supervision of the various systems rather difficult. The Hungarian standards related to IT security also lag behind international standards, whose rational adaptation is an absolute must.

The targeted IT audits performed by the Hungarian supervisory authority are linked partly to the licensing procedure, which examines the fundamental requirements, and partly to the audit that must be carried out every two years. In the course of the onsite audit of the prudential operation of the banks, the IT systems are also examined. The audit is always multilevel. First, information is obtained about the existence of regulations concerning the operation of the IT systems, whether the necessary checkpoints and controlling procedures are in place, whether extraordinary events are logged. In the second

step, which is resorted to when problems are experienced in the course of obtaining information, the IT and information security controls and their operation are reviewed. Information from the banks is obtained through questionnaires supplemented by data collected from the press and other sources. Experiences obtained in the course of monitoring and their results are also used in the course of subsequent audits. In designing questionnaires, the principle is that the respondent should not only complete it but also learn from it. The experiences gained by these audits may constitute the basis for developing the guidelines of risk management for these activities prescribed for the banks.

In co-operation with the NBH, the supervisory authority issued guidelines and a questionnaire for the banks in relation to the Y2K problem in order to size up the risks inherent in their IT systems. Banks had to draw up rules and procedures in case their payment services were disrupted due to technical reasons. As a result of the work performed in 1999, banks now have contingency plans with which they can maintain their fundamental payment services even in cases of emergency.

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