

**MONETARY  
POLICY  
IN HUNGARY**

*May 2000*

Produced by  
staff members of the Monetary Policy Department of the National Bank of Hungary

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The publication presents an overview of the monetary policy of the National Bank of Hungary.  
This, however, does not preclude the manifestation of personal views of the authors in certain chapters.  
These do not necessarily reflect the official standpoint of the NBH.

Produced by the Monetary Policy Department of the National Bank of Hungary  
Headed by György Sándor, Managing Director  
Published by the Secretariat of the National Bank of Hungary  
Publisher in charge: Dr. József Kajdi  
Translated by Németh & Pásztor International Kft  
Design typography and typesetting by the Publications Group of the Information Division  
1850 Budapest, V. Szabadság tér 8–9.  
Internet: <http://www.mnb.hu>  
ISBN: 963 9057 72X

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**Hungary's transition to a market economy has by now essentially come to an end. The judicious conduct of monetary policy has been an important factor in helping the economy develop along a balanced and sustainable path.**

The National Bank of Hungary (NBH) relies on an established and properly functioning set of instruments in the pursuit of its monetary policy objectives. The success of monetary policy depends, however, not only on the instruments available to the central bank and the experience gained in using these instruments. External shocks and the economy's ability to withstand them, the stability of the financial sector and the maturity of the money and capital markets are equally important factors which influence and constrain monetary policy decision-making.

Hungary has coped successfully with the challenges of economic transition. The economy is now growing at a relatively fast rate, inflation is declining steadily and the current account deficit is at a manageable level. Monetary policy has promoted this process through the deployment of monetary policy instruments which have supported Hungary's fixed exchange rate regime.

The expert deployment of monetary policy instruments is a necessary, but not sufficient condition for the effective functioning of the transmission mechanism of monetary policy. An equally important factor is that economic agents, ranging from professional financial organisations to

households, have a good understanding of our intentions and of the conditions for the achievement of our objectives of maintaining economic equilibrium and reducing inflation. Transparency and predictability improve the effectiveness of monetary policy, because they enable economic agents to anticipate monetary policy actions and calculate with their effects in their economic decisions.

To ease finding their way and with an intention of providing a compass, we annually present the Monetary Policy Guidelines to the public in general and to Parliament in particular. The NBH regularly publishes its Inflation Report. Communications disclosed about specific steps of the Central Bank and communiqués issued after meetings of the Central Bank Council are discussed extensively by the press. Once approved by its General Meeting, the NBH presents its Annual Report to Parliament. Nevertheless, we feel that this publication, which focuses not on the peculiarities of the momentary situation but on the operating framework and the general features of the Central Bank instruments, fills a vacuum.

This publication, *Monetary Policy in Hungary*, was compiled by members of the Monetary Policy Department of the NBH, who themselves are party to the everyday

workings of monetary policy, decision support activities and the formation and operation of the set of applied instruments. This is intended as a summary based on practical experience which, by virtue of its very subject, cannot in all of its parts be regarded as easy reading. While required to report on its activities to society at large, the National Bank of Hungary desires to provide informa-

tion first and foremost to readers interested in the subject matter of this publication.

I trust that, in its own way, this handbook will render the transmission mechanism of monetary policy smoother and, albeit indirectly, may contribute to the future development of the Hungarian economy.

*Werner Riecke*

# I. THE ROLE OF THE CENTRAL BANK IN HUNGARY





# A BRIEF HISTORY OF THE NATIONAL BANK OF HUNGARY<sup>1</sup>

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Although historically the Sweden's Sveriges Riksbank, established in 1668, is the oldest central bank, institutions acting as the government's banker came into being all over Europe, modelled in general on the Bank of England, which was established in 1694.

On the continent, the Austrian central bank was one of the first to be established; owing to the political framework, its scope of authority also extended to the territory of the Hungary of those days. Hungary's political significance, which increased within the empire as a result of the historic Compromise of 1867, was also expressed by the dual structure of the central bank, in accordance with the dualistic principles of the structure of the state. An independent Hungarian central bank came into being only after the break-up of the Monarchy.

## The Austrian National Bank and the Austro-Hungarian Bank

The Habsburgs regarded Hungary as a land conquered by arms while fighting the Turks and, in conducting their economic policy, they focused primarily on the interests of the Austrian hereditary provinces. The Napoleonic wars went hand in hand with **inflation** and an erosion of the value of money across Europe, hence the Austrian government attempted to keep the state debt and the issue of paper money under

control by setting up an independent government's banker.

*The Austrian National Bank (ANB), established by the Emperor's patent on 1 June 1816, was "a patented private institution under the special protection of public administration"*<sup>2</sup> whose business relations to the state were very close and secret. During those hard times, the Austrian National Bank regarded providing assistance to the state "as its obligation" and these "highly important services" were "acknowledged with gratitude" by the monarch.<sup>3</sup> ANB enjoyed a monopoly position regarding issuing banknotes and setting up branches in the territory of the Austrian Empire. In addition to lending to the state, the *discounting* of commercial bills of exchange and *lending on collateral security* grew into important lines of business. Uniquely among European central banks – owing to a mixture of central banking and commercial banking functions – ANB also pursued mortgage lending and debenture issues.

The Banking Act of 1862 was intended to regulate the relationship between the state and the central bank, not least with a view to dismantling the considerable accumulated state debt. According to the spirit of the Banking Act, the Austrian National Bank could be regarded as more independent

<sup>1</sup> For an explanation of the terms printed in bold in the text, see the glossary in alphabetical order.

<sup>2</sup> A Magyar Nemzeti Bank Története (History of the National Bank of Hungary) I, KJK, Budapest, 1993, p. 155.

<sup>3</sup> Expressions used in the Emperor's patent of 20 June, 1849; source: A Magyar Nemzeti Bank Története (History of the National Bank of Hungary) I, KJK, Budapest, 1993, p. 157.

than the Prussian Bank or even the Banque de France of the Second Empire in those days. The Emperor's right to appoint the bank's governor and the government commissioner was merely formal. According to the intention of the legislators, the bank could take action only as a commission agent handling the state's transactions and was under the obligation to discount only the bills regularly presented by the state. The acceptance of government papers as collateral for credit was excluded. This independence was maintained with minor modifications until 1878 when the Austro-Hungarian Bank was established.

Right from the very beginning, the Hungarian Estates disputed whether the Viennese bank's issuing powers extended to Hungary in terms of public law. The Batthyány government attempted to issue its own currency through the Pesti Magyar Kereskedelmi Bank (Hungarian Commercial Bank of Pest). However, this experiment failed together with the 1848–49 War of Independence. The question of an independent Hungarian central bank was raised during the negotiations of the Compromise. Eventually, the issue was closed with a compromise with the establishment of the dually structured central bank of the Dual Monarchy under the name of *Austro-Hungarian Bank (AHB)*. The bank held its statutory meeting on 30 September 1878. AHB's Deed of Foundation also bore this dual nature: on the one hand, it functioned as the central bank of the Monarchy covering its entire territory, on the other hand, however, in the spirit of equality in organisation and management, Budapest, like Vienna, acquired rights of administration and possibilities of influence.

Owing to the dualistic state establishment, the *organisation of the Austro-Hungarian Bank* was complex. The management of the bank was divided into decision-making and executive arms, the lower levels of which were dualised. Of the decision-making bodies, the Supreme Board,

the Governor and the committees of the Supreme Board were centralised, while there were two Boards of Directors functioning at each of the two headquarters, each headed by a Deputy Governor. The Supreme Board performed general supervisory functions over the entire banking operation. Each of the countries elected two representatives to the Supreme Board, who were also members of the Boards of Directors. The representatives of the Boards of Directors and even the government commissioners of the state participated in the meetings of the Supreme Board. The government commissioners were also members of the committees, increasing in number as time passed (Executive, Mortgage, Administration and Foreign Exchange Committees). Of the executive bodies, management and the central service functioned in Vienna with local services present in both capitals within the framework of a head institute in both cities.

At the time the Austro-Hungarian Bank was set up, *the coverage system* inherited from the practice of the Austrian National Bank was in operation with *silver coins in circulation*. Owing to the stocks of silver accumulated, compliance with the coverage requirement did not impede increasing the volume of banknotes, aligned with payment needs, at first. However, in addition to silver coins and banknotes, government notes were also in circulation, conversion on demand was not typical, hence it cannot be regarded as an unadulterated silver standard.<sup>4</sup>

After 1878, European countries migrated towards the *gold standard* one after the other and, beside the rise in the output of silver, this also led to a decline in the price of silver. By 1878, the premium on silver against the paper currency disappeared, moreover, a disagio of the silver florin evolved, that is, the face value of the silver florin exceeded its intrinsic value. Minting of coins by individuals for speculative purposes began to take on substantial dimensions, which was subsequently suspended.

It was under these conditions that the new monetary system of the Monarchy, *the aranykorona (gold crown) system*, was de-

<sup>4</sup> Conversion on demand was suspended on 29 April 1859 and this did not change in the course of the subsequent history of the Monarchy, not even with the introduction of the gold currency system (*the aranykorona*) in 1892.

veloped. Due to the absence of conversion on demand and the use of silver coins as legal tender, it could not be regarded as a pure gold standard (*limping gold currency*). Following the example of the German Reichsbank, a 5 per cent *banknote tax* was introduced as an indirect instrument. With this transformation of the coverage system, the Austro-Hungarian Bank set out on the path of becoming a genuine central bank, the banker of banks.

The Deed of Foundation of the Bank was suspended in the middle of 1914 after the outbreak of the First World War, and the disbursement of government loans began. The principles of coverage for the gold currency were gradually softened. The Austro-Hungarian Bank accepted war bonds as collateral up to 75 per cent of their face value, whereby the central bank covertly financed the government's military expenditure. The continuous deterioration in the exchange rate of the *korona* (crown) and the depletion of the stock of precious metals necessitated the setting up of the *Foreign Exchange Centre* on 1 February 1916, following the similar German example with a delay of one month.

The successor states of the Monarchy, falling apart in the wave of revolutions following the Great War, created their independent currencies one after the other. The Hungarian economy was in a difficult position. The level of investments declined, foreign exchange reserves were depleted and the sources of foreign capital ebbed away. Inflation ran high because the war was financed by running the banknote presses and heaps of banknotes flew in from the successor states.

## The Independent Hungarian Central Bank

### Preparations

In the wake of the Great War, European bankers felt that the political powers of the European Reparations Commission greatly

impeded the recovery of the financial system, hence they made efforts to curb its political influence in general and to reinforce the **central banks independence** in particular.

It was during this period that the National Bank of Hungary was established with substantial international, particularly British, support.

By the mid-1920s, the victorious west European states overcame the economic and political crisis following the war and stabilisation of the entire continent became their primary concern. One of the preconditions of the loan to be granted by the League of Nations to promote stabilisation in Hungary was the setting up of an independent Hungarian central bank.

The Austrian peace treaty, signed on 10 September 1919, provided for the liquidation of the Austro-Hungarian Bank. The Hungarian peace treaty took over the relevant part *verbatim*. The temporarily extended licence of the joint central bank ultimately expired on 31 December 1919.

The Austrian and the Hungarian management of the joint bank were separated as of 1 January 1920 and banking operations were pursued separately even in accounting terms with headquarters in Vienna and in Budapest, albeit retaining the name of Austro-Hungarian Bank.

The *Magyar Királyi Állami Jegyintézet* (Royal Hungarian Note Issuing Institute) was established in August 1921 with *Dr. Sándor Popovics*, the former finance minister of the third Wekerle government and head of the financial mission of the Hungarian peace delegation, at its head.

According to the idea entertained by Minister of Finance Lóránt Hegedűs, the Note Issuing Institute was called upon to prepare for the migration from the *korona* to the new legal tender in support of the consolidation. The Note Issuing Institute took over the assets, employees and part of the business of the former joint central bank.

To curb profiteering in currency and to halt the erosion of the value of the *korona*,

the Foreign Exchange Centre<sup>5</sup> was called back to life on 8 August 1922.

## From the Foundation of the NBH until the Second World War

In February 1924, the Reparations Committee accepted the Hungarian reorganisation programme and, in order to re-establish the creditworthiness of the Hungarian State, released the rights of pledge for reparations. As part of the legislation package on reorganisation, *Act V determined the establishment and scope of operations of the National Bank of Hungary on 26 April 1924*. In this Act, the state conferred the exclusive right of issuing banknotes on the NBH until 31 December 1943. The *statutory meeting* was held in the Ceremonial Hall of the Academy on 24 May 1924; Sándor Popovics took the position of President and Béla Schróber was appointed Director General. The Bank began its operation on 24 June 1924<sup>6</sup> and published its opening balance sheet on 30 June.

<sup>5</sup>The Institution existed from 1 January 1916 until 25 November 1925 within the framework of the National Bank of Hungary. At first, the intention was but to maintain a registry of demand and supply and an organised, transparent market of foreign currencies, hence those acceding to the Institution had to make their receipts of foreign currencies intended for sale available to the Centre and to obtain their foreign exchange and currency needs from the Foreign Exchange Centre indicating the purpose of use. Foreign currencies required for the purposes of the state were handled separately from the Foreign Exchange Centre. The Austro-Hungarian Bank was given the management of the Foreign Exchange Centre. The bank agreed to make available the cash it had from export transactions to the Centre and also to satisfy the needs of its clients from the Centre. As the Foreign Exchange Centre was already running a deficit in the first months of its operation, the AHB used its own stocks and later borrowing from abroad also became necessary. Central exchange rates broke away from market rates (for greater detail, see the History of the NBH, pp. 373–377). By a decree, issued on 23 December 1916, trading in foreign currencies was made subject to official licensing and the independence of the Foreign Exchange Centre was abolished.

<sup>6</sup>The base rate was set at 10% and the *korona* was pegged to the British pound (pound sterling 1 = 346,000 paper korona, 1 aranykorona (gold crown) = 17,000 paper korona).

<sup>7</sup>The consideration behind taking the Bank's shares to the stock exchange was that the state should divest itself of the shares it had received in exchange for transferring assets of the Bank to private hands as soon as possible, thus guaranteeing the central bank independence from the state.

<sup>8</sup>From then on, the National Bank of Hungary continued to apply foreign exchange controls until the early 1990s.

The state was the largest of the Bank's founders with its 39.5 per cent holding. In addition to the community of the Budapest-based financial institutions (*TEBE – Takarékpénztárak és Bankok Egyesülete* – Association of Savings Banks and Banks), Austrian, Swiss, Dutch, Romanian and Czechoslovak financial institutions and companies subscribed to the Bank's shares. The shares of the National Bank were introduced to the Budapest Stock Exchange<sup>7</sup> on 21 September 1925. The National Bank of Hungary took over the *management of the state's account and the national debt*. It has been a shareholder in and an active member of the Bank of International Payments (BIS) right from the foundation of the latter (1930).

By the summer of 1924 inflation had declined significantly, the NBH stabilising the exchange rate of the *korona*, pegging it to the British pound. In April 1925, the gold standard was adopted again for the pound sterling, consequently the *korona* again became a gold-based currency. The new currency, the *pengő*, which was founded on the stabilisation of the *korona*, was introduced in November 1925, although it entered circulation only from 27 December 1926.

The stabilisation of the 1920s relied to a great extent on foreign funds. Short of fundamental structural reforms, the world economic crisis, which exploded in the autumn of 1929, hit a Hungarian economy deeply in debt and non-competitive in many respects. The financial crisis reached Hungary in July 1931 and there was a run on the banks by deposit holders. To protect reserves, *foreign exchange controls* were reintroduced and maintained over the long term.<sup>8</sup>

With the shift to a wartime economy, announced in the 1938 Győr Programme, there was a sudden surge in printing banknotes and the national debt began to increase. In order to finance the budget, the independence of the NBH was curtailed and the Bank was obligated to finance the state. With the declaration of war, the state became the most important consumer and a major portion of industrial output was put to satisfy the state's needs.

Lending by private banks was also made subject to state control. War spending was financed by issuing short-term government papers, which were discounted by the central bank. Increasing the money supply in this manner stoked inflation from 1941–42, resulting in unprecedented acceleration and *hyperinflation* from 1944.

With the conclusion of the armistice agreement, the tasks of the NBH were taken over by coalition committees set up on political grounds; all the central bank was allowed to do was to run the banknote presses. Control of the economy was already divided politically at that time.

## Shift to a Command Economy

With the rebuilding of the economy in the wake of the war, industrial output increased gradually and agriculture also became more organised. With gold stocks returned and short-term foreign loans, there seemed to be a chance of *stabilisation*. To support this, lending was made subject to close control and companies were instructed to accumulate stocks of the most important articles. By limiting the amount and the period of lending to the state, the NBH contributed significantly to the successful introduction of the new currency, the *forint*<sup>9</sup> on 1 August 1946. A banknote ceiling was set at Ft1 billion and strict compliance with the ceiling also supported the strength of the new currency.

## The Central Bank in the Period of the Socialist Command Economy

The artificial shortage of money, created by restricting banking activity and lending, aimed not only at keeping the money supply and inflation under control, but also at restraining stock exchange and commer-

cial banking activities in preparation for the subsequent nationalisation of the banks and the large companies held by them (Act XXX of 1947). During 1947–48, the NBH was turned practically into an absolutely new organisation subject to the supervision of the Ministry of Finance. The NBH was given exclusive rights to control the financial activities of plants accounting for 80 per cent of the country's industrial output. The NBH supervised lending and the management of state-owned companies, which contributed half of the product turnover. Companies were obligated to manage their financial and lending activities through their NBH single account. Investments originally planned to have been financed by credit soon became gratuitous (that is, financed by budgetary funds).

In the *one-tier banking system* thus established, in addition to the commercial banking functions performed by the NBH, additional specialised financial institutions were set up (Investment Bank, Co-operative Credit Institution, National Savings Bank, and Foreign Trade Bank) in the spirit of pro-life clean-up.

The NBH reorganised its functions of foreign exchange authority, managed the pre-war debts as well as the obligations of war reparations. Although it aimed at prudent loan appraisal to protect the stability of the forint, the political criteria of the agencies of public administration prevailed to an increasing extent over the views of the Bank's experts in 1947–1948. During the period of the first five-year plan (1950–1954), the monetary policy of the NBH had to support investments, the forced military development programme of the Cold War and the reorganisation of agriculture. The NBH had but an *administrative*, mechanical role in implementing these. Pursuant to the 1949 Constitution, nominally, the NBH retained its legal form as a company limited by shares, while it was placed

<sup>9</sup> The exchange rate of the forint was determined on the basis of the consumer prices of the last peace years, 1938–1939; on that basis, one dollar was equivalent to Ft11,739.

under government control.<sup>10</sup> Because of its commercial banking activities, the Bank's branch network expanded substantially: by 1952, there were 134 NBH branches operating all over the country (as against the 21 branches functioning at the time of nationalisation), while the number of its employees reached 9,000.

Execution and licensing of foreign exchange operations became an exclusive right of the NBH from 1950. At the same time, the new management of the NBH (in contrast with the Soviet example of 1917) endeavoured to repay its foreign loans and to compensate the foreign owners of nationalised assets, which was implemented by 1970.<sup>11</sup>

With the establishment of the CMEA, the NBH was made responsible for the financial transactions between the member states. Although in the course of the consolidation of the economy after 1956 the separation of the tasks of the central bank from commercial banking functions was raised on several occasions, this was never implemented. However, the economic reforms enhanced the significance of the monetary policy instruments available to the NBH and, with the recovery in foreign trade in the 1960s, the Bank expanded its domestic foreign exchange market activities.

In the last quarter of 1960, the network of regional directorates was gradually dismantled and 19 county-based directorates were set up.

To find a way to improve the alignment of the command economy and the market, the experts of the NBH also participated in the development of the "*New Economic Mechanism*" of 1968. The monopoly rights of the NBH awarded after 1948 concerning issuing, the regulation of payments, account management and foreign exchange management were reinforced by decree.

<sup>10</sup> The post of the President was abolished, the Director General was appointed upon the recommendation of the Minister of Finance by the Council of Ministers. The posts of the President, Vice President and Managing Director were re-established by a law-decree of the Presidential Council in April 1956.

<sup>11</sup> The process of compensating the foreign shareholders of the NBH was completed somewhat earlier, by 1967.

This decree clearly separated the central banking and other national economic functions of the Bank, leaving the one-tier banking system and the principle of government supervision of the NBH intact. Once again, the central bank's legal form of operation was that of a company limited by shares.

Under the New Economic Mechanism, *credit policy guidelines* were developed annually by the newly established Credit Policy Council of the NBH. Based on the guidelines, the NBH was responsible for its implementation and supervised its execution. This meant greater scope for making decisions based on economic rationality and profitability. The so-called supervision by the Bank, which, in practice, meant administrative intervention in the management of companies and the levying of fines, was abolished. Steps were also taken towards liberalising foreign trade by slightly streamlining import licensing and by adjustment of the exchange rate of the dollar. The organisational units responsible for central banking functions were more markedly divorced from those in charge of commercial banking functions.

The historical events of 1968 constituted a turning point for the Hungarian economic reform, which appeared, *inter alia*, in the form of *endeavours to re-centralise the economy*. From January 1972, the NBH had exclusive responsibility for financing the invested and the current assets of organisations pursuing economic activities. The role of the State Development Bank was restricted to financing specific major investment projects from the state budget. The deterioration in the terms of trade due to the oil crisis narrowed the elbowroom of the reform, which was limited in any case, and the *debt crisis* of the early 1980s was an unmistakable sign of economic tension. The NBH financed the external disequilibrium by borrowing from abroad and issuing bonds, which was far from being general practice in an central-east European country of those days.

In parallel with its international borrowing, the NBH developed its network of international representative offices in the major financial centres of the world (1967–1995 Paris, 1970–1995 Zurich, 1973–1995 London, 1973–1998 Frankfurt, 1974–1975 Beirut, 1977–1996 New York, 1983–to date Tokyo). The NBH provided a channel for continuous communication with the advanced countries and it was partly due to this that Hungary acceded to the International Monetary Fund and the International Bank for Reconstruction and Development in 1982.

## The Transformation of the National Bank of Hungary and the Banking Sector in 1987

In the 1980s the country had to adjust to an altered international economic environment. As a result of this, the inflexibility of the financial system was also softened: new institutions came into being, securities in the form of bond issues appeared, a trade law was enacted, credit lines were extended and factoring was launched. The artificial boost to growth led to significant additional debt accumulation in the short term. It was the recognition of the unsustainability of this process that led to reform of the banking sector.

The basis for the change was provided by a change in the approach of economic policy: in the 1980s, when genuine steps were taken to develop market conditions, it became evident that a radical transformation of the banking sector was also required. The inflexibility of the one-tier banking system and the absence of lending based on business criteria under “quasi market” conditions obviously impeded the development of the market elements of the economy. In its December 1984 resolution, the Central Committee of the Hungarian Socialist Workers’ Party declared that the central

banking and commercial banking functions would have to be separated within the NBH and preparations for the establishment of a *two-tier banking system* would have to begin. The Hungarian banking sector was transformed into a two-tier one as of 1 January 1987. Under the new regime, the National Bank of Hungary was designated as the central bank, that is, the bank of issue.<sup>12</sup>

Under the new system, the NBH became the bank of the banks and of the state; it was subject to the control of the President of the Council of Ministers. Its responsibilities included influencing the money supply and facilitating the achievement of the economic policy objectives of the government with the traditional instruments of monetary and credit policy (interest rate policy, reserve policy, refinancing, **open market operations**). The NBH continued to be responsible for managing the state’s account and lending to the budget and it retained the licensing of foreign exchange turnover. The NBH regulated and controlled the activities of the commercial banks. Three of the five commercial banks established with the transformation of the banking system into a two-tier one (the Hungarian Credit Bank, the Hungarian Commercial and Credit Bank and Budapest Bank) came into being by separating the General Credit Directorate, the Pest County Directorate and certain branches of the NBH.

The commercial banks came into being not with a regional or sectoral character (even though the predominance of one or the other sector could be observed in the case of the newly established banks), which implied the possibility of genuine competition among them. Foreign examples, by which banking systems organised on a sectoral or regional basis could be studied, showed that in those cases banks enjoying virtual monopolies stood against the companies, and the differing needs of the sectors and regions impeded

<sup>12</sup> The term “bank of issue” was used extensively in Hungarian literature on banking even before the transformation of the banking system into a two-tier one, which arose from a decisive classical function, that is, the monopoly of issuing banknotes, instead of the term “central bank” used mainly in other languages.

the establishment of uniform and normative regulation. After the original central distribution, the banks were free to develop their clientele. The banks established with nation-wide scope were founded in the form of companies limited by shares with the state as their majority shareholder, represented by the Ministry of Finance. Companies and co-operatives held minority portfolios.

After the 1990 elections, in the spirit of the transition to a market economy, Parliament enacted *Act LX of 1991 on the Central Bank* and *Act LXIX of 1991 on Financial Institutions and Banking*, since then both amended several times. The new Act on the Central Bank re-established the independence of the NBH and re-regulated its opera-

tions. The central bank has an obligation to report to Parliament and has become independent of the government. The Bank autonomously develops and implements its monetary policy.

With the institutional reform in the second half of the 1990s, non-central banking functions were dismantled. As part of this process, foreign representations and stakes were liquidated with one exception. In November 1996, the 18 county-based directorates were wound up to be replaced by eight regional directorates. From 1 January 1999, the number of regional directorates decreased to four, with their seats in Debrecen, Győr, Kecskemét and Székesfehérvár.



# THE ROLE OF THE NATIONAL BANK OF HUNGARY — IN THE FINANCIAL SYSTEM

## The Functions and Role of the Central Bank in the Financial System

The tasks of the central bank are set forth in most countries in some form of legal regulation (generally an Act of Parliament). A comparative analysis of the central banks of different countries reveals that central banks strongly differ from one another in terms of their powers and structure, due to the fact that their functions may also range over a wide scale.

Traditionally, central banks have a monopoly of issuing money. Through this function, it is the task of every central bank to mould the supply of credit and money and, in relation to this, to influence market rates, that is, to pursue monetary policy. A central bank may have full or partial responsibility for shaping exchange rates and managing the foreign exchange reserves of a country.

Central banks manage the payment (settlement) accounts of commercial banks and safeguard the fixed and freely disposable reserves of the banks. They play an important role in the maintenance of payment systems. Most of them are responsible for the stability of the financial system, partly through controlling and supervising banks and other credit institutions and partly through being the lender of last resort. Most of the time, the central bank is also the bank of the government. Its tasks may include exchange controls; in some countries they

manage either a part or all of the country's debt. Units to analyse the economy and to conduct research are also required for the performance of the tasks of a central bank. The above list illustrates how manifold the functions of central banks may be. The question, however, is which of these functions are the ones through which a central bank can exert influence on the economy of a given country.

The history of central banks reveals that there are tasks which are common to most of them, affecting the very heart of their operation. Effective instruments of central banks to influence the financial environment, in which their respective economies operate, *include the right and possibility of controlling the money and credit supply and, consequently, of influencing market rates.* The monopoly of issuing banknotes and the banker of banks function – the management of the banks' accounts, fixed and free reserves and their financing (which, typically, is concomitant with the role of the **lender of the last resort**) provide this opportunity to a central bank. Management of the exchange rate regime and foreign exchange reserves can hardly be separated from setting interest rates, although the treasury often plays a part in this process. These days, management of the accounts of the budget has less of an influence over the money and credit supply. Nevertheless, being the state's banker is a classic and emphatic role for most central banks.

In countries where the central bank has sufficient independence to set interest rates, legislation frequently specifies the objectives, for the achievement of which the bank may use this power. As in the case of most central banks of the world, *the fundamental task of the National Bank of Hungary, as set forth by law, is to protect the purchasing power of the local currency.* The powers given to the central bank (its functions), employed in the interest of protecting the purchasing power of the currency, constitute the monetary policy of the central bank.

In addition to protecting the purchasing power of the forint, another task of the NBH is to support the implementation of the government's economic policy programme with the instruments of monetary policy available to it.

That is to say, the NBH plans and implements its monetary policy harmonised with the economic policy developed by the government.

**Abstract 1: The Legal Standing and Fundamental Function of the NBH Act on the Central Bank, Chapter I**

§1. The National Bank of Hungary (hereinafter the "NBH") is the bank of issue of the Republic of Hungary, the central bank of the national economy.

...

§3 The NBH shall support the implementation of the government's economic policy programme with the instruments of monetary policy (money and credit policy) available to it.

§4 (1) The fundamental function of the NBH is to protect the domestic and external purchasing power of the national currency.

The objective set by law for the central banks of many a country may differ from that of achieving price stability (there may be other macroeconomic objectives included in the set of objectives, whether subordinated or on an equal footing) but central banks can realise the objectives set through their monetary policies everywhere.

The first and *most important task* among the functions of the National Bank of Hungary is of a *macroeconomic nature: the operation of monetary policy*, that is, influencing the money and credit supply with a view to safeguarding the value of the local currency. The central bank may implement this task based on the following classic central banking functions:

- *issuing*, that is, monopoly over issuing banknotes,
- the banker of banks – lender of the last resort function,
- the government's banker, and
- management of foreign exchange reserves.

Central banks, however, have a second set of functions, which includes all the tasks required for the maintenance of the sound operation of a banking system and *financial stability*. When a bank functions poorly, it makes a loss and may even lose its equity, its consequences are highly detrimental to the entire economy. It may imperil confidence in the banking system and, through this, confidence in the currency as well as the propensity to save. Depending on the magnitude of the problem, it may disturb the operation of the entire banking sector.

As a central agency, the bank of issue establishes the conditions which attempt to *minimise the risk factors* which might endanger the safe operation of the banks. Thus the role of the central bank in supporting the banking sector goes further than assisting them when needed by being their lender of last resort.

The functions of the National Bank of Hungary, which assist in the sound operation of the banking sector, include the following:

- regulatory functions,
- bank supervisory functions, and
- maintenance and development of the **payment system**.

As it was indicated at the beginning of this chapter, the central banks of the various countries of the world may perform a number of additional functions, but the range of the tasks allotted to them may also be narrower. The functions required for the sound operation of the banking sector may be – and in many places are – performed by organisations other than the central bank, which are independent from it. It is disputed to this day how these tasks may be performed with the greatest efficiency – whether inside or outside the central bank. *The list assigned to the two groups of functions reflects the tasks of the National Bank of Hungary as set forth in the Act on the Central Bank* which, in the main, coincides with the functions of the central banks of most industrially advanced nations.

Both knowledge and analysis of the appropriate indicators of the economy, the money and capital markets and the performance of the banking sector are required equally for pursuing monetary policy and maintaining financial stability. By virtue of its position, the National Bank of Hungary is an institution belonging to the official statistical service, collecting as well as supplying data. *Data collection and reporting* are special tasks of the central bank linked to both sets of its functions.

The following sections provide an overview of the tasks of the National Bank of Hungary based on Act LX of 1991 on the Central Bank. The subsequent chapters will unfold the functions, serving as the basis for pursuing monetary policy, in greater detail focusing on the objectives and the set of in-

struments of monetary policy and its impact mechanism.

## Issue of Banknotes and Coins

Under the Act on the Central Bank, the National Bank of Hungary has exclusive authority to issue domestic legal tender – forint banknotes and coins – to determine its denominations and to withdraw them from circulation in Hungary. When making payments in the Hungarian legal tender, the banknotes and coins issued by the NBH must be accepted by all at face value.

### Abstract 2: The Legal Standing of the NBH and its Fundamental Task Act on the Central Bank, Chapter I

§4 (2) The NBH has exclusive authority to issue banknotes and coins.

At the time when payments were effected largely in cash, central banks were able to directly influence the total amount of money in circulation through their issuing monopoly.

Banknote issue was a key function of central banks. With the technical development in payments and the proliferation of forms of cashless payments, the share of cash – taking longer-term trends into account – has been declining in the economy. (For categories of money supply, i.e. the monetary aggregates, the monetary base and its relation to the money supply see the section on “Monetary Aggregates” for greater detail.) Although the regulation of money supply cannot be limited to controlling cash turnover, i.e. to the amount of cash in circulation, the changes of cash in circulation arising from changes in payment

habits, the technical changes of the **payment systems** and their forecasting continue to play an important role in monetary policy. The central bank is responsible for *fully satisfying the cash needs of turnover* by up-to-date banknotes and coins in an adequate series of denominations.

The production of banknotes used as legal tender is a complicated technical process, ranging from design to the destruction of banknotes that have become superfluous or unsuitable for use. (Prevention of counterfeiting is an important criterion in banknote design and production.) In addition to issuing banknotes, the National Bank of Hungary also issues and puts into circulation forint coins. The comprehensive renewal of the legal tender was completed in 1999, which began with the replacement of coins in circulation in 1993 and continued with the introduction of the first element of the new series of banknotes – the 10,000-forint denomination – in 1997. The National Bank of Hungary withdrew all the denominations of the old series of banknotes and coins from circulation by October 1999; now only the six denominations in the new series of banknotes and the seven denominations in the series of coins are available for cash payments.

The banknotes of the new series were made using modern base materials, new technologies and state-of-the-art security elements.

Currency denominations shifted towards growing face values in accordance with the requirements of turnover: the face value of the highest and the lowest banknote denominations doubled, while *fillér* coins were eliminated from circulation.

As the banknotes of new denominations gained ground and as a result of the withdrawal of denominations not required in circulation, the overall amount of banknotes and coins in circulation has decreased over the past few years while the value represented by them has increased dynamically.

Early in 2000, the banknotes and coins in circulation represented a total

value of Ft810 billion, within which the share of banknotes was 98 per cent, that of coins, 2 cent. About 10 per cent of the value of the cash in circulation can be found with financial institutions and 90 per cent outside the banking sector (in households, retail trade, cash desks of business organisations, etc.).

## The Central Bank as the Banker of banks

The special position of the National Bank of Hungary – and that of the other central banks – arises from the fact that commercial banks depend to some extent on central bank money.<sup>13</sup>

First, the banks need cash to disburse deposits placed with them by their clients and the loans granted to them, which they can obtain only from the central bank.

### Abstract 3: The Tasks of the NBH:

#### The Account Management Activity of the NBH

#### Act on the Central Bank, Chapter II

§26 (1) Unless another credit institution is authorised, the NBH shall manage the settlement accounts of credit institutions.

(2) The NBH shall manage the payment accounts of clearing houses.

(3) The NBH shall manage the payment accounts of the National Deposit Insurance Fund and the Investor Protection Fund.

<sup>13</sup> Financial literature tends to mention central bank money as “the monetary base”, which includes cash outside the central bank and the banks’ reserves kept with the central bank. For greater detail, see the section on “Monetary Aggregates” in the chapter on “Indicators”.

Second, the central bank manages the payment accounts of credit institutions, which means that these accounts of the credit institutions always have some kind of a balance (stock) to settle cashless **inter-bank transactions**.

Third, banks in Hungary must place deposits with the NBH corresponding to a specified ratio of their stock of liabilities (for greater detail, see the section on “Regulation of the Reserve requirement”). (Until the autumn of 1994, the reserve requirement accounts and the banks’ payment accounts were separated. With the introduction of the giro system, the two accounts were merged and the banks may use the outstanding balances of their payment accounts in excess of the **reserve requirement** in the interbank clearing system.

The above three factors taken together – cash in circulation, the banks’ required reserves and their balances to be used freely in payments – constitute the monetary base, over which the central bank exercises control. By influencing these stocks through various instruments, the central bank can act upon the amount of money in circulation (*the money supply*).

An important question of monetary policy is to what extent is this relationship – for instance, between changing the central bank rates and the change in the money supply – close and calculable under given conditions (see the chapters on monetary aggregates and transmission).

Not every bank depends directly on the money provided by the central bank. The amount of central bank money, required for the appropriate magnitude of balances, is not necessarily obtained from the central bank. Banks, which for a transitory or even a sustained period have more central bank money (*liquidity*) than necessary, may lend to banks struggling with transitory liquidity shortages through the **interbank** money market. All in all, however, the money market does not have more central bank money than that created by the central bank.

## The Lender of Last Resort Function

### Abstract 4: The Tasks of the NBH:

#### Extraordinary Credit in the event of an Emergency at a Credit Institution Act on the Central Bank, Chapter II

§17 (1) In the event of an emergency, the NBH may extend an extraordinary credit to the credit institution. Availability of such NBH credit may be subject to the measures to be taken by the State Banking Supervision in an emergency and the implementation by the credit institution of the measures initiated by the State Banking Supervision.

Liquidity needs arising from time to time among banks are part of the ordinary course of business. Banks have several market instruments to cover such needs (selling government papers or foreign exchange assets, etc.) and the central bank as the banker of banks may also extend a credit to a financial institution. It may, however, happen that a bank’s *liquidity shortage* becomes permanent or it may suddenly get out of hand. The central bank has the opportunity to provide banks, struggling under a transitory or lasting liquidity crunch, with central bank money under an extraordinary procedure. Therefore, this function is closely related to that of ensuring money supply to the banks (“banker of banks”) and that of maintaining a sound banking system.

The question may arise why the central bank should bail out an ill-functioning bank struggling with liquidity shortages, which may be attributed to mistakes in conducting business. Beyond the fundamental problem that, in the event of a bank

failure, deposit holders may lose their savings, there is the odd chance that, depending on the size of the bank, the crisis may spread to other banks as well. A run on the banks may lead to serial insolvency, which may paralyse a part or all of the banking system, and thereby violently retard the economy.

Therefore, when considering the rescue of a bank, the implications of a *bank failure*, which may shake confidence in the banking system and the currency, decrease savings and imperil economic stability, should also be considered in all cases, in addition to protecting investors. To illustrate the importance of preventing bank failures, the economic crisis of 1929–33 is usually referred to as an example.

It was bank failures which triggered a major decline in money supply seen in the United States during this period, which many economists regard as the cause and driving engine of the economic collapse which took place in the course of the crisis.

The question may also arise: why rescue these banks in order to protect depositors when the institution of deposit insurance stands between them and any damage they might sustain? At first sight, it may seem that a *deposit insurance fund*, which exists in most countries to protect and insure deposit holders against losses arising from bank failure, could render the role of the central bank as lender of the last resort superfluous.

This, however, is not true for two reasons. On the one hand, deposit insurers insure deposits only up to a certain limit – in Hungary, up to Ft1 million – and although the small amounts of deposits constitute only a very small fraction of the total deposit portfolio, should bank failures occur in large numbers, the insurance funds would be unable to fully cover even the small-value deposits. (Most probably, however, the central bank, as lender of the last resort, would stand behind the insurance funds and put up the

necessary funding in most countries.) Secondly, deposits with a value above Ft1 million are not insured by the deposit insurers. The shaking of large deposit holders' confidence in the banking system could easily lead to a run on the banks, so bank failures may arise in spite of the deposit insurance system.

The role of **lender of the last resort** may not only protect the economy from the detrimental effects of bank failures but also provide protection against *money market crises* caused by them.

A financial panic will always have a highly detrimental impact on an economy as it impedes the fundamental task of financial markets of channelling free funds to efficient investment opportunities. In the case of a stock exchange collapse, a large number of broker firms may find that they need supplementary financial assets to finance their activities. Banks may deny the possibility of additional financing for broker firms precisely because of the impending failures.

As far as its form is concerned, the lender of last resort function rarely means some kind of extraordinary lending irrespective of the monetary policy instruments available; it is always closely related to the monetary policy instruments of central bank money supply that characterises the given country (see the chapter on “The Instruments of Monetary Policy”).

The techniques of central bank money supply may be manifold (auctions, rediscounting, standing facility) just as it varies from country to country how a central bank may want to influence use of central bank money via interest rates or other direct regulatory instruments (quotas) or any combination thereof. Choice among and regulation of these instruments is part of regulating money supply, that is, of monetary policy.

When, however, the central bank lifts some restriction specified in the regulations with respect to a single bank to rescue it, *the instrument will fulfil the lender of last resort function*.

Assistance may also come in the form of a *transitory exemption from the reserve requirement*. Although banks may use their required reserves to cover their payments, by the end of the month they must, on average, meet the reserve requirement. In the case of an exemption, liquidity depending on the magnitude of the reserve requirement will be released for the given bank. In Hungary, central bank money thus released may substantially expand the liquidity of any given bank, owing to the ratio which is deemed high in international comparison (12 per cent).

Although the role of the central bank as the lender of the last resort has the advantage of preventing bank failures and financial panic, the declaration of this possibility may also have detrimental aspects. It may be that banks, expecting to receive assistance from the central bank, *undertake higher than prudential risk* in various fields of banking operations, largely in lending.

This risk is likely to be higher in the case of major banks because they may believe that they are too large and too important for the central bank to deny them assistance, for their eventual failure would, with much greater probability, lead to a run on the bank and the probability of the panic rolling on to other banks is also higher. This explains why a central bank uses the instrument of lending as a last resort only when it really is the last resort.

There is an aspect of the lender of last resort function which is closely related to the maintenance and operation of the payment system: the NBH may provide borrowing facilities with a view to the smooth operation of the payment system. Should a bank wrongly assess its liquidity position in advance and should its **liquid assets** fail to provide coverage for the items to be transferred at the time of settlement in the clearing system, *the central bank ensures the continuous administration of interbank payments by lending*. But the rate on such loans is above the money market interest rate.

## The Central Bank as the Government's banker

There are several aspects to the relationship between the NBH and general government. First, the NBH as the government's banker manages the single account of the Treasury.

### Abstract 5: The Tasks of the NBH: Relations to General Government, the Account Management Activity of the NBH

#### Act on the Central Bank, Chapter II

§ 18 (1) The NBH manages the Unified Treasury Account and other state accounts designated by the Minister of Finance.

(2) The NBH manages the payment account of the State Privatisation and Holding Company, whose balance shall continuously be included in the balance of the Unified Treasury Account at all times.

Second, in relation to the account management function, the NBH may have a financing relationship with the budget.

The financing relationship between the state budget and the central bank has long traditions in most advanced European countries. In view of past experience, however, legislators may set strict limits for this activity so as to prevent the infringement of the rights of central banks to pursue autonomous monetary policy.

Pursuant to the Treaty establishing the European Union (the Maastricht Treaty), neither the ECB nor the central banks of the member states may extend current account financing or other types of credit to community institutions or agencies, central, regional or local authorities or other central agencies or publicly owned companies of the member states; it is also prohibited for them to directly purchase

debt securities from these institutions and agencies. The intention of this provision is on the one hand to reinforce budgetary discipline in the member states while eliminating one of the main sources of inflation. On the other hand, the prohibition on the disbursement of direct credit by the central bank to the government is an important factor with regard to the *independence* of the national central banks and the European Central Bank (ECB).

Over the past few years, the financing relationship between the NBH and the Hungarian budget has also undergone major changes. In 1990, placements by the central bank to general government exceeded 70 per cent of its total placements (balance sheet total).

The restructuring of the economy in subsequent years necessitated that the credits of the central bank be redirected in favour of the business sector.

The Act on the Central Bank, enacted in 1991, still reflects the practice which prevailed at the time of the adoption of the Act, namely, that the NBH financed the central budget by way of lending (on the basis of loan agreements), albeit putting a ceiling on financing the central budget through central bank credit, declaring that the increment in the portfolio of credit extended to the central budget in a given year may not exceed, even on a single day of the year, three per cent of the estimated revenue of the central budget in the given year.

So that the central budget would not enjoy a privileged position relative to the other agents of the money market, the base rate of the central bank – that is, a market-based interest rate – governed lending to the central budget.

The 1994 amendment of the Act on the Central Bank (Act IV of 1994) enabled the restricted financing of the ‘current fund of the budget’ (today termed as the Unified Treasury Account – KESZ) in the event of a transitory liquidity crunch of a few days in order to ensure continuous money supply because of the asymmetric flow of budgetary revenues and expenditures within the

month. This loan, which may be extended up to 2 per cent of the annual revenue estimate of the central budget, may be outstanding for no more than 15 days in any month, either on several occasions or on end.

The central budget pays the base rate set by the central bank on its debt of liquidity credit to the NBH at all times. The practice of the past few years, however, showed that the budget did not make use of this credit facility, as together with the account of ÁPV Rt., the balance of KESZ has been positive.

The 1996 amendment of the Act on the Central Bank (§19 (3) of Act CXXIV of 1996 amending Act LX of 1991), which constitutes the legal regulation currently in force, *prohibits lending by the NBH to the central budget*, with the liquidity credit being the only exception.

The prohibition of direct central bank financing could come into being only because, with the development of the domestic capital market, the budget had increasing opportunity to finance its deficit without involving the central bank directly from the market through issuing government papers.

The central bank may also finance the budget not only by direct lending but also through purchasing government papers. It does make a difference, however, whether this is done in the *primary market* – which in practice would mean that the NBH could participate in government paper auctions – or whether government papers are bought only in the secondary market. In the first case, there is a possibility for the central bank to finance the deficit through the auctions under pressure from the eventually growing financing requirement of the budget, which implies the threat of distorting yields away from market levels. Purchases in the secondary market, i.e., when the central bank buys government papers which had already been acquired by market agents, have less influence on government paper yields than buying them upon issue in the primary market, which in fact consti-



tutes a form of direct financing of the budget.

The central bank's participation in securities trading in the secondary market is, in contrast, necessary for the efficient implementation of monetary policy (for the operation of the instruments and for the open-market operations) since the central bank may need an adequate portfolio of se-

**Abstract 6: The Tasks of the NBH:  
Relationship to General Government,  
the Account Management Activity  
of the NBH  
Act on the Central Bank, Chapter II**

§19 (1) The NBH may have a financing relationship exclusively with the central budget of the subsystems of general government.

(2) With respect to its financing relationship to general government, the NBH shall be responsible to Parliament.

(3) With the exception mentioned under Subsection (4), the NBH shall not extend any credit to the central budget. The NBH may purchase government papers under open-market operations. The NBH shall not purchase government papers directly from the state.

(4) To overcome the transitory liquidity difficulties in the Unified Treasury Account, the NBH may extend a liquidity credit to an amount not exceeding two per cent of the revenue estimate of the central budget in the given year. The central budget may have such debt on liquidity credit outstanding on several occasions or on end, but never exceeding 15 days in a calendar month; the central budget may not have any debt on liquidity credit on the last day of the year.

curities. Because of these considerations, *the Act on the Central Bank prohibits the NBH to directly purchase securities from the state, i.e., to buy in the primary market.* According to an amendment, however, there is nothing to impede the NBH from purchasing government papers in the secondary securities market in the form of **open-market operations** while pursuing its monetary policy objectives.

This regulation is also in harmony with the principles set forth in the Maastricht Treaty establishing the European Union, under which the central bank is not prohibited from financing the budget, but it is prohibited from doing so by avoiding the capital market.

These principles have the purpose of safeguarding the **independence of the central banks** in the member states of the European Union and help to prevent wrong economic policy decisions being made because of distorted information. At the same time, the elbowroom provided to central banks to perform operations in the secondary market may be exploited only to achieve the objectives of monetary policy and may not serve to bypass the prohibition on the direct financing of the central budget.

## Foreign Exchange Reserve Management at the NBH

One of the most important tasks of central banks throughout the world is the management of the foreign exchange reserves of their countries. The *objectives of maintaining reserves* are nearly identical in each country, although the relative importance of individual objectives may be different depending on the situation of the given state. The main objectives of maintaining reserves are *intervention, transaction and asset accumulation*. The predominance of any objective for any central bank at any given point in time is determined by a number of factors, including the exchange rate regime applied, the

magnitude of debt and the **balance of payment**. In ultimate cases, when economic agents are for some reason (such as war, crisis or natural calamity) no longer able to do so, the foreign exchange reserves of the central banks are put towards effecting the foreign exchange payments of the country (imports, etc.).

In Hungary's case, all three fundamental objectives obtain. Under the current exchange rate regime, the NBH, in principle, assumes unlimited obligation to buy or sell at the two edges of the fluctuation bands permitted around the centre rate determined by the **currency basket**. To meet this obligation, it must have foreign exchange reserves in an appropriate amount. The interest and principal repayments for foreign exchange credits taken out by the NBH and the state are also effected directly from such reserves. A sufficiently high reserve enhances the confidence of foreign investors and lenders vis-à-vis the country, which eases and renders cheaper the raising of funds abroad for all economic agents.

Ultimately, the *source of increasing reserves* may be a positive balance of the **current account** or an influx of capital. The investments of foreigners and the foreign exchange funds of the domestic private sector are converted into forints in the interbank foreign exchange market. To reach (or to maintain) the desirable level of reserves, foreign exchange credit may need to be raised. The state may raise foreign exchange credits in the domestic or foreign money and capital markets or from large international organisations (IMF, World Bank). Until 1999, it was the NBH, currently it is directly the state that appears in the foreign markets.

There is no generally accepted formula, valid for every country, to determine the *optimum amount of reserves*. The most frequently used "unit of measurement" is the import requirement. According to this, the average amount equivalent to three months' imports can be regarded as an acceptable reserve level. This is but an average figure. In practice, the advanced coun-

tries can do with 1–2 months of import requirement, while in the case of the less developed countries, 6–8 months' imports is the characteristic magnitude. Naturally, the desirable magnitude of foreign exchange reserves depends on a number of factors, such as the applied exchange rate regime, the ability of the country to draw in funds, the openness of the economy and the volatility of the balance of payments. The three-month import requirement is presented as the minimum figure in the reserve policy of the NBH. The external debt service, which debits the central bank's reserves, raises the reserve level regarded as desirable by the value of three-month's repayment on average. In stipulating the final reserve level, the central bank also takes into account potential short-term capital flows.

The *currency structure of the reserves* generally reflects the direction of the foreign trade relations of individual countries. Owing to this, the share of the dollar and the yen is higher in the foreign exchange reserves of Far Eastern countries, while in Europe this role is taken over by the euro. It is a general tendency that the role of gold in reserve management has declined to the minimum in most countries. The NBH keeps its foreign exchange reserves in the major currencies, primarily in euro and dollar, while the share of gold is minimal. The currency structure reflects the composition of the external payments of the country and of the forint's basket.

From the viewpoint of *investment guidelines*, central banks tend to place the main emphasis on security within the "holy trinity" of investors: security, liquidity and yield. This is understandable as central banks manage the foreign exchange reserves of their country, which usually represents a significant amount both in absolute value and as a percentage of GDP. It is therefore no accident that these institutions are regarded as the largest and at the same time most conservative investors of the world. Accordingly, apart from a very few exceptions, they do not invest in, for in-

stance, shares or real estate. Characteristically, they seek papers of the highest credit rating in the securities markets and they generally buy the government papers of the advanced countries. The criterion of liquidity is important because, in the event of **intervention** or an eventual crisis, the reserves must be deployable immediately and without any substantial loss of value in order to meet their fundamental functions. Yet again, by virtue of their size, it is only the government papers of the largest and most advanced countries that can meet this requirement. Bearing in mind the criteria of security and liquidity, reserve managers aim at investing the reserves in assets promising the highest possible yield. The foreign exchange reserve management guidelines of the National Bank of Hungary are in line with international central banking practice. Only the largest commercial and investment banks and securities houses are listed as counterparties licensed for trading.

## The Regulatory Function

The regulatory activities of the central bank are divided between licensing cases requiring operative measures and theoretical activity, i.e. the development of regulatory proposals applicable to businesses operating in the money and capital markets and providing opinions on these.

Licensing powers with respect to activities performed in the money and capital markets are traditionally divided in Hungary between the State Money and Capital Market Supervision (SMCS) and the NBH. Hence, in spite of the fact that the SMCS licenses the vast majority of financial and supplementary financial services which may be pursued by financial institutions under the statutory provisions in force since 1997, the NBH continues to be the licensing authority with respect to certain services.

As for the specific range of financial and supplementary financial services (such as the issue of means of cashless payment and the provision of related services, cash

### Abstract 7: Miscellaneous Provisions: Powers Act on the Central Bank, Chapter V

§71 (1) Within the limits of the law, the NBH may issue mandatory requirements via central bank instruments to financial institutions, legal entities which do not qualify as financial institutions performing supplementary financial services, investment service providers and clearing houses, ...

(2) With respect to payments, central bank instructions shall apply to legal entities, business organisations that are not legal entities and natural persons.

processing, clearing activity) referred by legal regulation to the licensing authority of the NBH, the assessment of the license applications and decision-support are the responsibility of the NBH. Under this function, the NBH organises the review and assessment of the applications received by the Bank as well as the necessary consultations and, on the basis of its findings, it puts forward recommendations for granting the license or refusing to do so.

Although the independent regulatory authority of the NBH extends only to subject matters related to the central banking tasks taken *stricto sensu*, *prudential regulation* aimed at the safe and sound operation of the money and capital market is of outstanding importance for the NBH with regard to all the domestic financial markets, particularly the banking system. Therefore, with a view to reducing systemic risk, the central bank participates in the preparation and evaluation of proposals concerning **prudential regulation** and, in this context, in supervisory activity.

The *legislative function* includes a review of existing legal regulations, the development of proposals for amendment and

the preparation, development and reconciliation of new ideas. While doing this, the central bank utilises information obtained in the course of assessing and evaluating license applications and gleaned from the day-to-day activities of the bank's other lines of business, together with the relevant regulatory recommendations of the various international bodies and the publications appearing in financial literature.

With respect to the last-mentioned, analysis of the relevant rules of the EU and harmonisation of related fields in the domestic legal system are of key importance.

A special field of central banking activities is the *foreign exchange licensing function based on the powers of the NBH as foreign exchange authority*.

**Abstract 8: The Tasks of the NBH:  
Foreign Exchange Management Tasks  
Act on the Central Bank, Chapter II**

§28 The NBH is the central agency of foreign exchange management. The powers of the NBH as foreign exchange authority are specified by the legislation on foreign exchange.

§29 (1) In agreement with the State Money and Capital Market Supervision, the NBH regulates the banking activities of credit institutions, financial enterprises and legal entities which do not qualify as financial institutions providing supplementary financial services in foreign currencies and, furthermore, in applying foreign exchange legislation, banking activities performed with foreigners in forint terms. The NBH shall participate in the development of the principles and conditions of extending export credit.

(2) With the exception of the government credit specified under §24, foreign credits may be taken out and extended by the

NBH and, subject to the licensing or reporting obligation as set forth in Subsection (3), by credit institutions and other legal entities.

(3) Credit institutions, authorised to perform foreign exchange operations, may take out foreign credits subject to a reporting obligation to the NBH. The NBH may authorise credit institutions to extend credit to non-residents and other legal entities to extend and raise credit abroad.

Act XCV of 1995 on Foreign Exchange entered into force on 1 January 1996. This enabled convertibility in a wide range for the so-called **current payment operations** for both residents and non-residents according to foreign exchange regulations, thereby satisfying the requirement of convertibility according to Article VIII of the Articles of Agreement on the International Monetary Fund, which was also a precondition of obtaining OECD membership. With respect to capital operations, rules were substantially liberalised in the case of the direct investments of residents abroad (direct acquisition of businesses) and raising and extending foreign exchange credits abroad maturing over a year, while the foreign exchange authority maintained the licensing of short-term capital import and export in order to pre-empt the non-desirable effects of hectic capital inflow.

When the criteria of assessing an application with a view to licensing by the foreign exchange authority are not determined by foreign exchange legislation, the foreign exchange authority must consider the interests of the national economy or the circumstances of the applicant or the beneficiary when forming its resolution. Bearing in mind the interests of the national economy, the foreign exchange authority does not issue licenses for operations which contradict the monetary policy objectives of the National Bank of Hungary.

## Bank Supervision

The operation of financial institutions regulated by laws and decrees is supervised by two institutions: the State Money and Capital Market Supervision, an agency directly subordinated to the government, and the National Bank of Hungary, which has a reporting obligation vis-à-vis Parliament.

The State Money and Capital Market Supervision controls compliance with the requirements of Act CXII of 1996 on Credit Institutions and Financial Enterprises (capital adequacy ratio, principles of asset valuation, requirements concerning their management, profits, liquidity, solvency, etc.).

The expectation of efficiency set against monetary and central bank regulations presupposes that the NBH should satisfy itself that the relevant legal regulations and the central bank's instructions issued on the basis of authorisation conferred by these legal regulations are enforced in the everyday practice of financial institutions and, if so, in what way. This is done in the course of *central bank supervision*.

The scope of the central bank's supervision extends to compliance with the instructions of the President of the NBH concerning the reserve requirement and with legal regulations concerning payments, bank credits and foreign exchange management, as well as the central bank's requirements issued to implement them. Thus, according to the current practice of supervision by the central bank, this kind of inspection primarily involves examining compliance with legislation concerning the reserve requirement, the interest rates to be applied on a mandatory basis according to legislation, and the regulations concerning information to be provided under the central bank's information system.

There are certain financial services for which only the NBH may issue a license, which it may withdraw. These include the issue of instruments of cashless payments and related services, money exchange activity, operations which may be performed

in electronic clearing systems, and cash processing.

**Supervision by the central bank** is effected fundamentally on the basis of the central bank's data collection system, that is, the data provided by the financial institutions. The possibility for *off-site inspection* is provided by the daily, monthly, quarterly and annual reports required to be sent to the two supervisory organisations. The order of reporting set forth by regulations provides the basis for the central bank whereby it can monitor the condition of the system of financial intermediation. In the course of inspection, however, the NBH is entitled to request supplementary data, reports, balance sheets, vouchers and other audit materials.

*On-site inspections* are performed by the division of the central bank established for this purpose. In the course of an on-site inspection, meeting the **reserve requirement**, compliance with the rules of foreign exchange management and payments, and the accuracy of the various types of reports are examined.

### Abstract 9: The Tasks of the NBH: Supervision by the Central Bank Act on the Central Bank, Chapter II

§35 (1) Supervision by the central bank shall extend to reviewing compliance on the part of financial institutions and legal entities which do not qualify as financial institutions providing supplementary financial services, investment service providers and clearing houses with the provisions of this Act, the legal regulations concerning payments, and foreign exchange and the central bank requirements issued for their implementation. Under this, the NBH is entitled to request data, reports, balance sheets, vouchers and audit materials.

(2) In the course of supervision by the central bank, the NBH is entitled to perform on-site inspection.

The Act on the Central Bank also specifies the legal consequences of violations of the law established in the course of inspections by the central bank.

**Abstract 10: The Tasks of the NBH:  
Supervision by the central bank  
Act on the Central Bank, Chapter II**

§36 (1) When a credit institution puts the central bank funds extended by the NBH to lending activities which violate a legal regulation, the NBH may charge a penalty rate in addition to the rate specified in the refinancing credit contract up to the amount used in contravention of the law.

(2) When a credit institution violates the legal regulations and requirements referred to under §35 (1), the NBH may charge a penalty rate in addition to the transaction rate and may enforce shorter maturities in its refinancing credit contracts to be concluded with the credit institution for a year, starting from the establishment of the fact of violation of the law; in recurrent or severe cases, it may, in part or in full, exclude the credit institution from refinancing.

A system of supervision, based on uniform requirements avoiding duplications, as reflected in the Act on the Central Bank, requires that the operation of the State Money and Capital Market Supervision and the NBH be harmonised. Thus, co-operation with the State Money and Capital Market Supervision has priority among the organisational relations of the NBH. An organisational safeguard of co-operation is that the head of the Supervision must be invited to participate in the discussion of agenda items at the meetings of the Board of Directors of the NBH which affect the functions of the State Money and Capital Market Supervision.

The State Money and Capital Market Supervision may issue various licences required for the foundation and operation of financial institutions only in possession of the opinion of the NBH obtained in advance.

Regular information exchange serves as the safeguard of substance for co-operation between the NBH and the State Money and Capital Market Supervision. The two organisations make data and information, obtained on the activities of financial institutions and the issue of and trading in securities, available to one another on a mutual basis and inform each another of the findings of their inspections and, if necessary, they may initiate procedures by the other entity.

## Maintenance of the Payment System

The vast majority of cash put into circulation under the issuing activity of the central bank (of banknotes and coins) is used by households. Payments among the other agents of the economy, e.g. various firms, companies and general government are administered largely through the transfer of funds between bank accounts. In addition to changes in the balances of clients' accounts, turnover of account money also results in debit and credit positions between the banks concerned. Credits and debits generated in the interbank clearing are settled on the settlement accounts of the financial institutions held by the central bank. Settlement is preceded by clearing, that is, sending payment instructions to their destination and the calculation of mutual debts and claims within *interbank clearing*.

The stability and safe operation of the interbank **payment system** is the precondition of the stability of the entire domestic financial system. This is reflected by both the Constitution and the Act on the Central Bank, according to which the NBH is responsible for the development and smooth operation of the payment and clearing systems.

**Abstract 11: The Tasks of the NBH:  
Tasks related to Payments  
Act on the Central Bank, Chapter II**

§33 (1) The NBH shall develop the national payment and clearing system.

(2) The NBH shall regulate payments.

§33/A (1) Approval from the NBH shall be required for the entry into force of the rules of business of the clearing house of credit institutions, or any amendments thereof, which operate the transfer system administering clearing; the clearing house for credit institutions shall publish its rules of business in the “*Pénzügyi Közlöny*” (Financial Journal).

(2) The NBH may require the clearing house for credit institutions to set aside a risk fund and may issue mandatory provisions concerning the mode and rate of provisioning and the use of the fund.

The President of the NBH may issue instructions which, as far as payments are concerned, also apply to individuals. Central bank instructions specify the forms of payment that may be applied in domestic payments as well as the essential rules of their administration, including, *inter alia*, the process and due dates of settlement.

Beyond its regulatory powers, the central bank also pursues a specific type of supervisory activity, the objective of which is first and foremost to guarantee the efficiency and stability of the clearing systems, operating as the system of financial contacts among financial institutions. The central bank licenses the operation of the clearing houses of financial institutions and supervises their activity. *Giro Elszámolás-forgalmi Rt. (Giro Clearing House Ltd.)* was founded in 1989 for the purpose of setting up and operating the interbank clearing sys-

tem. Its shareholders include the financial institutions and the NBH, which is its largest shareholder holding 14.7 per cent of its equity. Risks similar to those in clearing among financial institutions may arise in the activity of *Központi Elszámolóház és Értéktár Rt. (KELER – Central Clearing House and Depository Ltd.)* supervised by the State Money and Capital Market Supervision. KELER is responsible for the processing of payments related to stock exchange transactions with securities and derivatives. The NBH holds 50 per cent of the shares in KELER.

#### KELER

In countries having highly developed financial markets, there are institutions which – as a service – perform, as their main function, all the tasks necessitated by the management and clearing of the vast quantities of market securities.

With the explosive expansion of trading in the stock exchange, the need for setting up an independent clearing house and depository to provide a wider range of services efficiently, quickly and safely for the participants of stock exchange transactions also arose in Hungary. As a result of thorough professional preparatory work, the Central Clearing House and Depository (Budapest) Ltd., was established on 12 October 1993, referred to as KELER by its abbreviated name. KELER was established and is still owned by the National Bank of Hungary, the Budapest Commodity Exchange and the Budapest Stock Exchange.

The founders specified KELER's main function as facilitating safe, rapid and cheap clearing and settlement of transactions on the security market in Hungary by running a service centre supporting primarily the activities of the members of the capital market community (securities traders and banks). KELER, therefore, acts as a central depository, keeps security accounts and provides other relating services. Under its clearing house functions, it not only provides services to the prompt market of the Budapest Stock Exchange, it also operates as the clearing house for the forward market of both the Budapest Stock Exchange

and the Budapest Commodity Exchange. It carries the greatest risks in its latter function as in the case of **forward transactions** the clearing house becomes a contracting party in the transaction between the buyer and the seller, similarly to international practice, and guarantees the settlement of transactions. In addition, KELER provides clearing services for the government security market outside the stock exchange (OTC market) and has increasingly extensive functions of a banking nature (keeping exchange cash accounts, interest payment, technical lending related to clearing, etc., treasury activity).

With the establishment of KELER and the development of the payment system, the implementation of DVP (Delivery versus Payment)<sup>14</sup> based clearing has become increasingly possible. The risk arising in relation to payments may be substantially reduced when the operation of the payment and the security clearing systems satisfies the principle of Delivery Versus Payment (DVP), that is, a mechanism is applied under which securities are delivered only if and when consideration is also paid.

The securities settlement system (the institution performing it) and monetary policy (the central bank) are connected in a number of areas. The central bank itself participates in transactions covered by government papers and KELER clears some of its operations. The cash leg of the securities transactions is often settled through the accounts managed by the central bank.

In relation to the payment system, the task and objective of the NBH is to guarantee the sound operation of the domestic payment system and to develop a national payment and settlement system running at minimum risk.

There is a close relationship between the efficient operation of clearing systems and financial markets because the more developed the payment system is, the more liquid the financial assets become, the more integrated financial markets are, and the

lower the transaction costs and financial risks are. Through this and the increasingly fast data and information flows, the efficiency of the central bank's steps, designed to influence the ultimate interest target through various market rates and variables, may improve.

On the other hand the payment system is also a channel through which unsound financial institutions may jeopardise the stability of the entire payment system. In such cases, to counter these kind of risks, central banks are forced to act as lender of last resort.

### *The Interbank Clearing System (BKR)*

The **interbank** clearing system, run by the *Elszámolásforgalmi Rt.*, is the *giro clearing system (Interbank Clearing System – BKR)*. *The system handles transfers gross, although it does not dispatch transfers promptly when receiving an order, they are cleared on the day in question at a specified point in time.*

Commercial banks are direct members of the clearing system, other financial institutions, such as savings co-operatives, link up with the giro clearing system through the commercial banks as so-called correspondent members. In the interbank clearing turnover, the system accepts only those orders whose cover has been provided by the credit institution in advance.

This cover consists of the balance of the settlement account held with the central bank and the securities kept with KELER pledged by the bank prior to clearing. The giro system processes the transfer orders received after the turnover of the day, late in the afternoon and at night.

If sufficient funds are not available for an item of a financial institution for any reason whatsoever, the system holds these orders pending in a queue. In such an event, the bank may either release additional li-

<sup>14</sup> The DVP principle: in the case of security transactions, settlement is effected only when securities on the part of the seller and the necessary money on the part of the buyer are available in the appropriate accounts.



quidity (of its own) to resolve the queue or it has various instruments (credit facilities) available to obtain additional liquidity from the central bank.

The NBH has a dual role to play in the clearing system: on the one hand, it clears and books the positions generated in the course of the overnight operation of the interbank giro system and it directly settles and books the orders of its own account holders (financial institutions) against one another during the day.

## VIBER

To modernise its services provided to credit institutions, the NBH introduced a new service in the autumn of 1999 – the *Real Time Gross Settlement System* (RTGS – or, in its Hungarian abbreviation, VIBER). The essence of the real time gross settlement system is that the moments of clearing and settlement are not separated in time, booking is effected item by item continuously and in real time.

Gross systems are generally based on the central bank's account management service. VIBER is also a gross settlement system, in which the processing of payment orders and their final settlement takes place continuously, while notifying participants concerned in real time. Payment transactions are settled immediately by the NBH provided that there is coverage and the system notifies the debited and the credited banks.

In Hungary, VIBER was established to process and settle urgent, typically large-value interbank payment orders. From March 2000 optionally and from July 2000 on a mandatory basis, VIBER also performs the urgent large-value orders of the bank's customers.

Small-value payment orders will continue to be administered in BKR in the future, but there is no mandatory value limit or other criterion for channelling turnover

between VIBER and BKR. VIBER's message communication network is S.W.I.F.T. (S.W.I.F.T. – Society for World-wide Interbank Financial Telecommunication – an international communication network).

The participants of VIBER include, on the one hand, credit institutions and, on the other, KELER (since it manages collateral for intraday credits and clears securities turnover), the Hungarian Treasury and the NBH, as a system operator and an agency which manages accounts, provides correspondent banking services and acts as a regulatory and supervisory agency.

VIBER's direct members are those banks and other institutions which keep their accounts with the NBH and are able to receive and send payment orders through their own interfaces. The correspondent customers of direct VIBER members are not members in VIBER, hence they do not have a VIBER account.

VIBER was so developed that the technical requirements of joining TARGET, the common European payment system, were in place already upon start-up. (TARGET – Trans-European Automated Real-Time Gross Settlement Express Transfer – is the common European payment system introduced in the third phase of EMU, established with a view to the integration and harmonisation of the national payment systems.)

With the implementation of VIBER payments are speeded up, consequently it is expected that banks will need less money for arranging the same size of payment turnover. Evidently VIBER has brought about technical changes as well as reduced risks and has introduced greater efficiency in comparison to the earlier system. The items which had earlier been booked directly by the NBH in the banks' accounts, without the involvement of the giro system in the morning or early in the afternoon, have been settled in real time through VIBER since September 1999. These operations include, for in-

stance, the payment operations between banks having settlement accounts, DVP securities transactions, cleared by KELER, transfer orders, where the beneficiary is an account holder bank, payments arising from transactions concluded with the NBH (disbursement and repayment of **refinancing credits**, open-market operations, foreign exchange operations, etc.), settlement of cash turnover administered through the intermediation of the Post Office or cash turnover affecting the account of a commercial bank.

Net bankcard settlements are also performed in VIBER (at 10.00 a.m.). In VIBER, as before, all settlements are effected after examination of coverage.

## Statistics

Pursuant to the Act on Statistics, *the NBH is an institution, which is part of the official statistical service*. Accordingly, it closely co-operates with the Central Statistics Office and other institutions of public administration concerning methodology, data collection and the transfer of data. In the course of its statistical activities, it collects data and issues publications about financial institutions in Hungary, financial relations between Hungary and the rest of the world, and other processes important for decision-making by economic agents.

### Abstract 12: The Tasks of the NBH: The Central Bank's Information System Act on the Central Bank, Chapter II

§34 (1) To perform its tasks, the NBH operates the central bank's information system, for which financial institutions

and legal entities which do not qualify as financial institutions providing supplementary financial services, investment service providers and clearing houses shall supply information required by the NBH. The NBH shall develop the content and methodology of the central bank's information system, inviting the opinion of the Ministry of Finance and the State Banking Supervision in agreement with the Central Statistics Office.

(2) The NBH shall publish all the important information concerning the operation of the banking system and the financial position of the country and it shall make their detailed data regularly available to Parliament, the government and the ministries (agencies with nation-wide authority).

(3) Data may be disclosed only in a form which prevents such information being traced back to individual data providers.

(4) Credit institutions shall publish the data specified by the NBH in the format determined by the NBH.

*Monetary statistics* produced by the NBH present the claims and debts of the banking system, i.e., the credit and money stocks, using the balance sheet data of the credit institutions and the central bank. In addition, it publishes data on the banks' lending and deposit rates.

Based primarily on the reports of the banks, the *balance of payments statistics* describe changes in the export and import of goods and services, income flows between residents and non-residents and changes in the claims and debts against non-residents. The same statistics present foreign exchange reserves and Hungary's foreign debt and other financial claims and debts.

The statistics presenting the *financing capacities of households*<sup>15</sup> describe the claims and debts of households incorporated in various financial assets and the components of their changes. In this case, the sources of data are manifold, ranging from the reports of credit institutions through the data of insurers and pension funds to information published in the daily press.

*Securities statistics* – based on the reports of investment fund managers, stock exchange companies and custodians of securities – provide an overview of the stocks of government papers, investment units and shares on the stock exchange, as well as their distribution among economic agents. In contrast to the statistics listed above and produced monthly, securities statistics are available to users on a quarterly basis.

The *statistics of financial accounts* present the stocks and flows of financial assets and liabilities of economic agents within the system of national accounts. The accounts reflect the changes during the accounting period, while balance sheets disclose the stocks outstanding on the opening and closing days of the accounting period. Within the accounts, those presenting transactions and other stock changes can be distinguished. Similarly to the other parts of the national accounts, accounts and balance sheets can be compiled by institutional sectors as well as for the whole of the national economy. Currently, as a pilot project, accounts are compiled for annual accounts; at a later date, they will be produced on a quarterly basis.

In addition to the above, the Statistics Department of the National Bank of Hungary receives a raft of data describing economic processes and conditions from other organisations, which are *published regularly* together with its own statistics in

*its Monthly Report*. In addition to the statistics already presented, the Monthly Reports disclose data regularly on real economic processes, *inflation*, exchange rates, general government and the capital markets.

*Press releases* on statistics, which contain up-to-date information on the **current account**, the consolidated balance sheet of the central bank and the banking system, savings, interest rates, cash stocks and securities, are designed as rapid vehicles for the supply of information.

The calendar forecasting the dates of publication of the Monthly Reports, press releases and statistical communications is also accessible through the Internet on the NBH website.

## Organisational Structure and Decision-Making

### The Bodies of the NBH Defined by the Act on the Central Bank

The bodies of the NBH as defined by law<sup>16</sup> include the General Meeting, the Central Bank Council, the Board of Directors and the Supervisory Board.

#### *The General Meeting*

It follows from the legal form of the National Bank of Hungary, which is a company limited by shares, that the supreme decision-making body of the NBH with respect to its fundamental conditions of operation and management is the General Meeting.

The shares of the Bank are held by the state. The Minister of Finance represents the state as shareholder. Rather than convening the General Meeting, the Minister of

<sup>15</sup> For greater detail concerning the concept of financing capacity, see the section on “Credit Aggregates and Net Financing Capacity” in the chapter on “Indicators”.

<sup>16</sup> Act LX of 1991 on the National Bank of Hungary (Act on the Central Bank).

Finance – acting with an authority that is narrower than the competence of the General Meeting – may bring *founder's resolutions*.

The ordinary General Meeting of the Bank must be held at least once a year at the latest by the end of May. General Meetings are convened by the Bank's President. Apart from the Minister of Finance, the members of the Central Bank Council, the Board of Directors, the Supervisory Board and the auditor must be invited to the General Meeting.

The President of the Bank may convene an extraordinary General Meeting whenever the need arises.

### *The Central Bank Council*

*The Central Bank Council is the supreme body of the NBH, governing monetary policy.* The Central Bank Council meets as needed but at least once every quarter. Its members are the President of the NBH as the chairman of the Central Bank Council, the Vice Presidents of the NBH, additional members in a number one more than the number of the Vice Presidents of the NBH appointed or recalled by the President of the Republic upon the recommendation of the Prime Minister, who must first solicit the opinion of the President of the NBH. The representative of the government must be invited to the meeting of the Central Bank Council with the right of being consulted.

The Central Bank Council makes decisions on the annual Monetary Policy Guidelines of the NBH, the central bank's position concerning exchange rate policy and any significant changes in the instruments of the central bank's policy, which go beyond the framework of the monetary policy adopted.

The Central Bank Council is in quorum when at least five of its members are present. It can adopt resolutions by a simple majority of the votes of those present; in case of a tie vote, the vote of the member chairing the meeting decides.

The President of the NBH is responsible for implementing the resolutions of the Central Bank Council.

The Central Bank Council itself determines its statutes within the limits of the Act on the NBH and the Deed of Foundation.

### *Board of Directors*

*The Board of Directors is the advisory body of the President of the Bank;* its primary task is to support the President in performing his tasks. In general, it meets every two weeks.

The total number of the Board members is at most eleven, consisting of the President, the Vice Presidents and other members employed by the NBH and elected by the General Meeting upon the recommendation of the President of the NBH.

In its capacity as the main advisory body, the Board discusses the drafts, recommendations, submissions and reports in a wide range of topics related to the tasks of the central bank and the management and organisational operation of the NBH.

The Board itself determines its statutes within the limits of the Act on the NBH and the Deed of Foundation.

### *Supervisory Board*

The Supervisory Board (hereinafter the "SB") is the controlling body of the NBH. Its members include the Chairman of the Supervisory Board elected by Parliament, three additional members elected by Parliament, the representative of the Minister of Finance and an expert appointed by the Minister of Finance.

The primary task of the Supervisory Board is to control whether the NBH operates in accordance with the provisions of the law, its Deed of Foundation and the resolutions brought by the General Meeting. It must immediately inform the Board of Directors whenever it learns of any violation of the law or any fact, omission or abuse in conflict with the Deed of Foundation or any resolution of the General Meeting.

Any member of the SB may request the chairman to convene the meeting of the Supervisory Board, indicating its reason and objective. The Supervisory Board may meet in privy when only those invited to the meeting may participate. Any member of the SB may initiate that the meeting be held in privy. When not all the members are present at the meeting, only the agenda items indicated in the invitation may be discussed.

The President of the NBH and other persons indicated in the Statutes of the Supervisory Board must be invited to the SB meetings. The Supervisory Board is in quorum when at least two-thirds of its members (four persons) are present; it brings adopts resolutions by open ballot with a simple majority of the votes. In case of a tie vote, the vote of the Chairman of the Supervisory Board decides. The members are entitled to annex their written statements containing their different positions to the minutes of the meeting.

The Supervisory Board itself determines its statutes within the limits of the Act on the NBH, the Act on Business Organisations and the Deed of Foundation which is to be approved by the General Meeting.

Based on the rotation principle, either the Chairman or a member of the Supervisory Board shall participate in the meetings of the Board of Directors in an advisory capacity.

### *The President of the NBH*

The NBH is headed by the President who is responsible for the performance of the tasks assigned to the NBH and governs the operation of the Bank.

A Hungarian national with outstanding theoretical knowledge and practical expertise in issues related to monetary, financial and banking activities may be appointed as President of the NBH. The relevant committee of Parliament hears the person nominated.

The President of the Republic appoints and recalls the President of the NBH upon the recommendation of the Prime Minister

for a term of six years. When entering office, the President of the NBH is sworn in the presence of the President of the Republic.

The President represents the Bank in the meetings of the government and the economic cabinet and in front of other agencies in matters of outstanding significance, including the meetings of international organisations of which the Bank is a member. The President decides in all matters which he has not delegated to the Vice Presidents, other managers or committees.

### *The Vice Presidents of the NBH*

The Vice Presidents of the NBH, at most five in number, are appointed and recalled by the President of the Republic. The recommendations are made by the President of the NBH, which are, if agreed, submitted by the Prime Minister to the President of the Republic. The recommendation must indicate the functions of the Vice President to be appointed. The mandate of the Vice Presidents of the NBH is for a term of six years.

The Vice Presidents participate in the governance of the Bank, including strategic decisions, developing the position of the NBH related to governmental and other documents affecting the functions of the Bank; they supervise the bank units subordinated to them, govern and control the lines of business subordinated to them and take action to have the necessary decision-support activities completed, the internal and external measures made that are required for performing these tasks and for implementing measures within their own scope of authority. The Vice Presidents make decisions in matters referred to their authority and represent the Bank in front of other agencies within the limits of their functions.

### *Standing Committees*

There are various standing committees in the National Bank of Hungary, responsible for decision support and providing grounds

for decision-making. With respect to conducting monetary policy, the *Monetary Committee* is of the highest importance. Its task is to regularly review the monetary situation and, within the limits of its authorisation, to develop and make operating monetary policy decisions. In addition, it has to harmonise domestic foreign exchange and forint market operations.

The competence of the committee extends to all the matters with respect to which the Central Bank Council did not reserve the right of decision-making and which were not referred to the authority of other committees or specific managers by the President of the Bank.

The committee is chaired by the President of the Bank, its members include the Vice Presidents and the permanent invitees.

The task of the *Banking Committee* is to facilitate decision-making and the adoption of measures and statements by the NBH, and the improvement of the operation of the banking system by monitoring and discussing the subject matters specified in its statutes and by making recommendations. According to the priority subject matters specified in its statutes, its competence extends to: the banking system and legal and other regulations concerning credit institutions; the operation of the central bank's rating system of credit institutions; the experience of supervising credit institutions by the central bank; significant individual cases related to the foundation, transformation and modification of the scope of operation of credit institutions; and adopting a position concerning recommendations aimed at individual exemptions from central bank measures.

The committee is chaired by the President of the Bank.

The function of the *Asset and Liability Committee (ALCO)* is to direct and harmonise the management of reserves and debt, based on the approved guidelines. In particular, it monitors changes in foreign exchange reserves and net debt, the conditions in international money and capital

markets, the changes in the exchange rates of important currencies and money and capital market rates, the preparation for drawing in funds, and changes in the cash flow position of the NBH in the light of debt and reserve management.

The committee is chaired by the President of the Bank.

## Central Bank Independence

### The Importance of Independence

A central bank is regarded as autonomous when it does not have to submit to either the direct or indirect pressure or the expectations of any body, organisation or person outside the Bank in the course of pursuing monetary policy and, if it refuses to submit, its action has no detrimental consequence of any kind with respect to the Bank.

The *independence of the central bank* is a highly important criterion with respect to the economic stability and external rating of individual states, because political cycles are relatively short and, in some cases, are not suitable for enforcing the long-term interests of the monetary economy, which a strictly professional institution without any political ties is able to implement more efficiently.

The primary role of central banks lies in driving inflation down to a low level and keeping it there in the long run in the interest of the optimal and smooth development of the real economy. In periods of parliamentary elections, however, governments frequently experience great pressure to raise nominal incomes particularly because – based on the principle of *money illusion* – a political organisation may benefit from the fact that a nominal increase in incomes may be followed by a rise in the price level only after an election.

*It has been demonstrated that autonomous central banks have been more successful in curbing inflation.* Analyses reveal a strong negative correlation between the degree of central bank independence and the rate of inflation and a slightly reversed correlation between the central bank independence and the rate of unemployment.<sup>17</sup> Independence, however, has no demonstrable impact on changes in national income.

In order to be able to call a central bank fully autonomous, a large number of criteria must be examined. Analyses of this kind tend to examine only independence in the legal sense. There are cases when the central bank is relatively independent in legal terms, but its authority is insufficient to enable it to behave fully independently vis-à-vis a less constructive governmental system.

At such times, it frequently happens that the management of the central bank, whether voluntarily or upon request, also leaves when there is a change of government or a change merely at the head of the Ministry of Finance.

In other words, the *de jure* and the *de facto* independence of central banks can be distinguished. In the case of states enjoying a stable legal system, legal independence and *de facto* independence coincide. In a number of developing countries, however, the legally autonomous bank cannot be regarded as *de facto* autonomous. (For instance, in the period between 1950 and 1989 in Argentina presidents of the central bank had a four-year guaranteed mandate, but they hardly acted for a year on average because the president resigned whenever there was a change in government or minister of finance.)

When measuring independence, we may witness a number of approaches in the advanced countries. There is an approach which distinguishes independence in "choice of target" and in "choice of instrument" and examines whether these criteria are met (e.g. in the United Kingdom, the central bank does not independently choose

its target, whereas it can be regarded as autonomous with respect to the instruments it uses).

This approach, however, examines only the independence of the activity (operation) of the central bank, which is not equivalent to full independence. It is in vain for a central bank to choose its targets and instruments with legal independence, since if it is not independent in terms of its personnel or financing, it will not fully meet the criteria of independence.

When examining independence, there are three areas worth examining: independence in operation, personal independence and financial independence. Their criteria are meaningful only in countries where the foundations of the legal system are secure and are widely accepted and honoured. A central bank can be regarded as independent or autonomous only if it proves to be such in all three of these areas.

## Personal Independence

A central bank is regarded as having personal independence when the persons involved in the bank's leadership cannot be influenced in their decision-making on political grounds and their attitude is professionally impeccable. Of course, when viewed from this aspect, it is not only the president (or governor) of the bank who needs to be independent but any other person or member of any body involved in decision-making.

Among the criteria of personal independence, the following are the most important:

The mandate of the bank's president and the supreme decision-makers must be longer than a parliamentary cycle. In appointing senior officials, continuity must be the aim in some form (e.g. relying on the

<sup>17</sup> Full reference to the analyses by Alberto Alesina, Lawrence H. Summers and Alex Cukiersman, Steven Webb, and Bilin Neyapi is presented in the bibliography.

principle of rotation<sup>18</sup>). These two conditions guarantee that the *decision-making bodies of the central bank should not become captive all at once and collectively to the same allegiances* even after the expiration of their members' mandates. There should be no possibility for recall for political reasons, that is, the *possibilities for recall must be specified and limited*. Appointments must be based on a broad consensus of the profession.

It is an important precondition to both personal and institutional independence that the decision-makers of the central bank should neither request nor accept instructions from any organisation or person while discharging their functions. This may be guaranteed if no *member of the decision-making bodies has any stake in political or economic institutions*. (They may not be members of parliament, municipalities or public administration or political grouping, etc. They may not have a stake in business either as shareholders or as employees.)

Neither the government nor its representative may participate in the decision-making bodies, and even if they do, they cannot have a right to vote. The government, government agencies or parliament should have only limited rights, or none at all, to call the bank to account for its decisions – with respect to monetary policy, no political forum of any kind should be allowed to override the decisions of the central bank.

As far as the above aspects are concerned, the *NBH* meets the criteria of personal independence because the mandates of the President and the Vice Presidents of the Bank exceed the four-year parliamentary cycle by two years. The President of the central bank is appointed upon the recommendation of the Prime Minister by the Pres-

ident of the Republic. For the appointment of the Vice Presidents by the President of the Republic, the proposal of the President of the central bank and the agreement of the Prime Minister are needed. The President of the central bank designates the Vice President substituting for him.

The members of the governing bodies of the NBH having the right to vote may not hold any office in any political party and may not undertake a public role in the interest of any parliamentary party. According to the rules governing conflict of interest, set forth in the Act on the Central Bank, the above persons may not become members of any entity, have an employment relationship or any other legal relationship concomitant with the performance of work, or serve as senior officials or be members of supervisory boards of credit institutions and the – **National Deposit Insurance Fund**.

Pursuant to the Act on the Central Bank, the President and the Vice Presidents may be recalled only in well-defined cases.

The supreme monetary decision-making body is the Central Bank Council, whose members include the President of the Central Bank, the Vice Presidents and additional members, whose number may be one more than the number of appointed Vice Presidents. The Prime Minister puts forward a proposal for the appointment of the latter, inviting the opinion of the President of the NBH. The representative of the government may participate in the meetings of the Central Bank Council in an advisory capacity.

## Operational Independence

Operational independence (or independence in action, functions or in the monetary field) obtains when the central bank makes its decisions on the objectives of its monetary policy and the development and deployment of its instruments independently of any external institutional or personal factor and, in doing so, is not under any obliga-

<sup>18</sup> By the principle of rotation we mean that the appointment of the members of the Central Bank Council or of the Vice Presidents is effected not all at once but with an even time lag. For instance, an expert is appointed to the supreme monetary decision-making body of the United States (Board of Directors) once every two years for a term of 14 years.



tion to accept requests or instructions from any entity whatsoever. (Independence in the choice of targets and the use of instruments.)

The most important elements of operational independence include the following:

An important criterion is how the objectives of a central bank specified by law relate to one another and what is the relationship of the ultimate goal to the other objectives. The ultimate goal of independent central banks generally relates to **inflation**. When that is not the only ultimate goal, it is necessary to examine what the relationship is between this and the other objectives. When they contradict one another or may become contradictory in certain situations, the priorities between the ultimate goals must be scrutinised. When, for instance, supporting the government's economic policy or curbing unemployment are stronger (or perhaps identical) objectives of the central bank than curbing inflation, the pursuit of an autonomous monetary policy may be endangered.

Another essential element of operational independence is the *agency, which develops monetary policy*. When the government has the possibility to interfere with monetary policy issues,<sup>19</sup> the given central bank cannot be regarded as autonomous.

In the case of central banks regarded as the most autonomous, there is a characteristic right to give advice to the government concerning current issues of economics, to participate in the meetings of the government or individual departments in an advisory capacity and to have a say in legislative activities. This right is not a condition of independence but precisely by virtue of the central bank independence, there tends to be a demand for it.

The Constitution specifies the "protection of the stability of the value of the national currency" as the task of the NBH in the field of monetary policy. Accordingly, driving inflation down to a permanently low level is the primary objective or ultimate goal of the NBH. The 1999 Act on the Cen-

tral Bank still specifies the support of the economic policy of the Government as another fundamental task. It is expected that this provision will be amended in relation to Hungary's accession to the EU in order to comply with the EU requirements concerning central banks. The proposed amendment: "The central bank shall *support the implementation of the economic policy programme of the Government without violating its ultimate goal* (i.e. the protection of the domestic and external purchasing power of the national currency) with the help of the monetary policy instruments available to it."

It is an important provision of the Act on the Central Bank that the Government may not instruct the central bank in its activities.

The Government is not in a position to directly influence the development of monetary policy. Indirectly, it may exert some influence through its natural role played in appointing the members of the central bank bodies and the President and the Vice Presidents. The Government has an opportunity, however, to expound and represent its opinion vis-à-vis the central bank through its participation in the Central Bank Council in an advisory capacity.

The NBH provides an opinion on the Government's economic policy programme, the decisions and legal regulations related to the Government's economic policy and reconciles the ideas concerning the financing of the budget deficit.

## Financial Independence

A central bank enjoys financial independence when it can obtain the funding required for the performance of these tasks in the course of its operation automatically, without depending on the government's ap-

<sup>19</sup> For instance, when the central bank is organisationally subordinated to the government or the Ministry of Finance; when the minister of finance may veto the decisions of the central bank; or when the representatives of the government participate in the decision-making bodies of the monetary authority with the right to vote.

proval. Financial independence, therefore, means that the central bank always has the authorisations required for its operation as well as the assets based on its own capital, without being dependent on the budget.

The Act on the Central Bank provides for the funding called to ensure the conditions of operation of the NBH. The central bank pays its profits – which remain after the amounts retained for development, provisioning and other purposes – as dividend to the central budget and the budget reimburses the NBH for the losses it incurs. Currently, this is effected by monthly settlement. In the course of law harmonisation, as part of the process of accession to the EU, probably the settlement process will also be amended by reviewing the Act on the Central Bank, for instance, by doing away with monthly settlements and setting aside reserve funds, in order to harmonise Hungarian legislation with the regulations applied to national banks within the European Union.

## The Requirement of Transparency in Central Banks

An important expectation vis-à-vis an autonomous central bank is transparency, i.e. the requirement that the *tasks and objectives of the central bank, their performance and the instruments used to achieve them be well delineated and information about them be available to all*. The condition of meeting this requirement is that the central bank publish its objectives, the decisions made to achieve them and the grounds for its decisions. The

requirement of *controllability* vis-à-vis central banks is designed to guarantee that the entities responsible for all of the institutions of economic policy (Parliament, Government) have an adequate overview of the operation of the central bank.

Pursuant to the Act on the Central Bank, the President of the NBH reports to Parliament on the activities of the central bank annually. Parliament may also request *ad hoc* information. The NBH provides information to Parliament about its monetary policy by presenting the “Monetary Policy Guidelines”.

The expectation set against the central bank to disclose its decisions and their grounds is important not only because of the controllability of the central bank’s activities but also because *it assists in the efficiency of the transmission mechanism* (the impact of the central bank’s interest rate and other measures exercised on the real economy through market yields). (*For an accurate explanation of the term and the description of the mechanism, see the relevant section.*) Disclosure of the objectives and the arguments laying the foundations for decisions clarifies the central bank’s policy and leaves no uncertainty in market agents about the motives behind the central bank decisions. They can learn how the central bank assesses the market processes which have taken place and, what is even more important, the forecasts and expectations of the central bank concerning processes expected in the future. Information of this kind speeds up the adjustment of market agents to changing circumstances and central bank decisions, suitably influencing their expectations, which greatly *improves the effectiveness of monetary policy*.

## **II. OBJECTIVES OF MONETARY POLICY AND ITS IMPACT ON THE ECONOMY**



# THE OBJECTIVES OF MONETARY POLICY

## The Ultimate Goal of Monetary Policy

The primary objective of economic policy is to achieve sustainable and rapid economic growth, which increases employment, raises the standard of living and helps close the development gap between the national economy and the economies of advanced countries. What is the role of monetary policy in this quest? Economic theory has long been trying to determine what objectives monetary policy should strive to achieve. This question generally arises in the context of whether it is possible to influence the real economy (economic growth and unemployment) with monetary policy instruments or their impact is limited to affecting the price level (inflation) and other **nominal variables**.

### The Development of Theory

At the end of the last century the views of “classical” economists concerning monetary policy were based on the doctrine of the neutrality of money with respect to the real economy. According to classical economists prices and wages adjust immediately, hence demand and supply are in equilibrium in all market segments of the economy. Changes in the money supply are immediately reflected in the changes of the price level, therefore there is no relationship between the nominal variables (money supply, price level) and the real economy. This is the condition of the so-called “classical dichotomy”, where the factors of production

alone determine the output of the economy and monetary actions only influence the price level.

Classical macroeconomics was unable to provide an explanation for the events of the world economic crisis of 1929–33 and the prolonged recession and long-term unemployment arising in its wake. The turning point in the history of economic theory was the emergence of the *Keynesian school*. Keynes and his followers went beyond the classical concept of perfect markets. According to their assumption, wage rigidities and long-term employment contracts prevent nominal wages from adjusting to changes in demand and supply conditions in **the short term**. As a result, sustained disequilibria may evolve in the labour market. Consequently, with wages fixed nominally, a boost in **aggregate demand** (which may be effected using both monetary and fiscal instruments) leads to a decline in real wages by raising the price level. At lower real wages companies are willing to employ more labour, thus production increases. Eventually, the economy achieves a new equilibrium at a higher price level, higher output and employment. In the Keynesian model, therefore, monetary policy is able to determine not only the price level but the level of output and employment as well. The trade-off between the price level (inflation) and employment is described by the so-called Phillips curve: higher inflation goes with lower unemployment and lower inflation goes with higher unemployment.

The emergence of the *monetarist school* at the end of 1960s was another turning point in macroeconomic theory. The monetarists questioned Keynes’ short-term approach and the assumption of slowly adjusting nominal wages. In the monetarist model,

wage negotiations focus on future real wages in contrast with the Keynesian assumption, where myopic trade unions negotiate about nominal wages. The problem here is that to be able to determine future real wages it is necessary to know or at least to forecast in some way the future price level. According to the monetarist assumption, the **inflation expectations** of economic agents adjust adaptively to actual price changes, i.e., they continuously rectify the forecasting errors of the past.

In the monetarist model monetary policy can, in the short run, influence the real economy. Increased money supply and the resultant rise in the price level temporarily reduce real wages and thereby increase employment and output. Wage demands, however, soon adjust to the higher price level and nominal wages rise to restore the former level of real wages. Output and employment return to their pre-monetary stimulus values, but the price level remains higher. Owing to this, monetarists discard monetary policy as an instrument for stimulating the economy, as it has temporary effects only. According to the monetarist approach, the economy would be in the best position were the central bank to expand the money supply evenly, in line with the growth of output.

*New-classical macroeconomics*, which evolved in the 1970s, took an even more radical stance regarding the relationship between monetary policy and the real economy. New-classical economics returned to the concept of the perfect market and, in addition, adopted the assumption of so-called rational expectations. Rationality in expectations means that economic agents prepare forecasts by efficiently using all the relevant information available to them at the time. According to the new-classicals, the information which serves as a basis for monetary policy decisions is also available to rational economic agents. Thus they will be able to predict with reasonably certainty the policy moves of the central bank and alter their inflation expectations accordingly. Predictable monetary policy will therefore have no impact on the real economy.

In the course of the theoretical debates of the various schools, positions evolved on many issues, which the vast majority of the profession is now willing to accept. Thus there is virtually unanimous consensus in monetary economics regarding the desirable

long-term objectives of monetary policy. The idea that *monetary policy is unable to influence real economic variables in the long run* is widely shared by economists. The efficiency of **short-term** anti-cyclical policy (which aims at reducing the periodical fluctuations of economic output), however, continues to be the subject of debate to this day. According to the advocates of the activist theory, because of market imperfections, including wage and price rigidities, monetary policy may have an impact on **real variables** in the short term and central banks can take advantage of this fact to reduce economic cycles. In response to that the opponents of activist monetary policy point out that owing to the long and variable lags of the **monetary transmission mechanism**, monetary actions risk having effects that are contrary to those originally intended. Beyond all this, rational economic agents will incorporate the expected moves of the central bank in their expectations, thereby neutralising their impact.

The theoretical view that monetary policy best serves economic development and growth by pursuing **price stability** as its primary goal has gained increasing acceptance in the practice of central banks. The development of theory and the failure of activist monetary policy strategies convinced the central banks of advanced countries – and to an increasing extent those of developing countries – to accept **price stability** as the ultimate goal of monetary policy and place less emphasis on output and employment targets, and to refrain from attempts to even out the **business cycle**. By maintaining price stability, the central bank creates a predictable environment in which economic agents can make sound economic decisions without having to be too concerned about future changes in the price level.

When reducing inflation and establishing price stability, the central bank has, however, to take into account the constraints arising from the economic environment and the need to maintain external and internal equilibrium. In general, curbing **inflation** is concomitant with a rise in **real interest rates**. When domestic state debt is

high, rising real interest rates increase government interest expenditure, which may further increase state debt. In addition, under a flexible exchange rate regime, anti-inflationary policy erodes the competitiveness of the economy vis-à-vis the rest of the world through the real appreciation of the currency induced by the rise in real interest rates.

This poses a problem primarily for countries with high foreign debt. Declining competitiveness may lead to a deterioration in the current account and raise foreign indebtedness to an unsustainable level. Finally, disinflation generally brings about a temporary decline in output and incomes, which may lead to social tensions. To be successful, an anti-inflationary programme must take into account these constraining factors and define a path for disinflation which is optimal for the given economy and society.

## Price Stability versus Economic Growth

Accepting the long-term neutrality of money, i.e., that monetary policy has no long-term impact on the real economy, a central bank may best contribute to the achievement of sustainable economic growth by reducing high inflation and the social and economic costs arising from this. Over the longer term, an artificial boost to demand or monetary expansion is unfeasible. Nevertheless, the real economic costs of disinflation, which may be substantial in the short term, particularly when an anti-inflationary policy is not credible, must also be taken into account.

Above an inflation level of 8–10 per cent, inflation perceptibly decreases the growth potential of the economy. Reduction in inflation also means a non-recurrent welfare benefit as it not only increases the rate of long-term growth but also raises the level of GDP. *The benefits of curbing inflation are permanent, while the costs of disinflation are transitory.* So, when ana-

lysing the welfare effects of **price stability**, the non-recurrent cost of disinflation should be set against the long-term permanent benefits arising from price stability. In general, this tips the scales towards curbing inflation.

### *The Long-Term Benefits of Price Stability*

The fundamental argument for achieving and maintaining **price stability** is that inflation is concomitant with social and economic costs.

The *social costs of inflation* can be perceived first and foremost through their effects on income distribution, although these effects are hard to quantify. Inflation hits the social strata the most in need and the least able to enforce their interests. In general, state transfers and other benefits constituting parts of the welfare net usually follow inflation with a time lag, thus the rise in the price level withdraws income from the social groups which are dependent on these services (pensioners, the unemployed, etc.).

Generally, a sudden leap in inflation affects those living off wages and salaries more painfully than entrepreneurs capable of more flexible adjustment, lenders more than debtors and those having financial savings more than those accumulating real assets.

When *indexing* is used in a wide range, these risks can be mitigated but cannot be fully eliminated in the development of prices and wages. Moreover, a practice of indexing based on *ex post* (backward looking) inflation may substantially impede the reduction of the rate of inflation.

The *economic costs of inflation* are also substantial. The fundamental consequence of the absence of price stability is that economic decisions concerning the future become more difficult to make and more uncertain in their outcome. Because of higher inflation, forecasting not only the envisaged average price level but also envisaged relative prices and wages, orient-

ing economic agents, becomes more difficult, owing to which the risks implied in wage contracts and the production and investment decisions of companies grow. Consequently, the period of contracts and the horizon of planning become shorter.

The example that strikes the eye the most in this respect is the shortening of the duration, i.e. the re-pricing period, of savings and credits. (In Hungary, for instance, bank deposits and credits are largely short-term and the average **duration** weighted with the **present value** of disbursements even in the most embedded, most developed financial market, that of fixed government papers, is no more than 1,4–1,5 years.)

Another detrimental consequence of inflation is that capital investments flow to the financial sector to an excessive extent thus *violating the requirement of efficient allocation of resources*. With a higher rate of inflation, the profitability of financial intermediation increases relative to productive activities. This distortion in allocation can be considerable.

According to estimates, even at a relatively low level of inflation, the share of the financial sector in GDP increases by 1 percentage point with every 10 per cent increase in inflation.

In the event of inflation, the cash-flow of the credit extended at the same real interest rate will be higher *thereby reducing the borrowing capability of the debtor* (credit crunch).

This is a particular problem in the case of housing construction and purchase credits, where the borrower does not realise the value of the property increased due to inflation, while it is included in the nominal rates on the credit. Consequently, with the decline in inflation, the portfolio of consumer and housing loans is expected to grow significantly, together with real estate prices.

<sup>1</sup> Although it did happen that tax bands were adjusted by the rate of inflation only with a time lag, the indexing of the tax systems is a method applied also in Hungary to counteract the negative effects of inflation.

Inflation also has an impact on *social welfare* through the system of taxation. When tax systems are not indexed at all or when they are indexed with a time lag only,<sup>1</sup> the acceleration in inflation increases the cost of capital, hence the extent of investment falls below the optimal level. A higher general tax burden leads to inefficient capital allocation among the various sectors.

### *The Short-Term Costs of Disinflation*

Empirical analyses in several countries have pointed out that the real economic costs of reducing inflation exceed the short-term growth advantages obtained by raising inflation.

The reason for this is that economic agents tend to adjust their **inflation expectation** more rapidly when inflation is growing than when it is declining. According to international experience, a 2–3 per cent decline in the rate of inflation tends to lead to a 1 percentage point decline in the growth rate in the short term.

The challenge for an economic policy endeavouring to curb inflation is that economic agents tend to be distrustful concerning the change in the priorities of monetary policy. It can be observed that the longer an economy has been characterised by high rates of inflation, the longer it takes to convince the public and to cool down their expectations of inflation.

The task of monetary policy is to reduce inflation in steps that are, first, sufficient to modify expectations in the desirable direction and, second, are not too large in comparison to that anticipated by society, that is, do not lead to serious growth sacrifice. Whether the reduction in the rate of inflation is “sufficient” or “excessive” depends on the speed of the adjustment of expectations.

Besides taking stock of the costs and advantages of reducing inflation, one should not neglect the preferences of society and economic policy in its entirety. No



country has ever undertaken to break moderate inflation all at once. Countries explicitly pursuing inflation related targets (for instance, Israel, New Zealand, the United Kingdom, Sweden, etc.) all voted for gradualism.

The conditioning of society to inflation and its relatively high level forced Hungary by necessity also to adopt the gradual approach.

The employees who suffered severe losses in real wages in 1995–96 are advocates of the policy of small steps even in the case of adopting *ex ante* (forward-looking) indexing because that provides security against major losses in position.

## The Ultimate Goal of Hungarian Monetary Policy

### *Sustainable Reduction in Inflation*

The ultimate goal of the National Bank of Hungary is to bring about a sustainable reduction in inflation. ***Sustainable reduction in inflation*** means that the path for disinflation is defined in such a way that it does not threaten external or domestic equilibrium.

The NBH not only desires to reduce inflation, it also sets the *continuity of disinflation* as its objective. This means that the central bank will evaluate the same rate of inflation differently when it is realised along a continuously declining inflation path from when it is a move up from a previously achieved lower level.

The central bank must keenly guard the continuity of the disinflation process, because it could quickly lose the public's hard-won confidence in monetary policy's resolve to combat inflation.

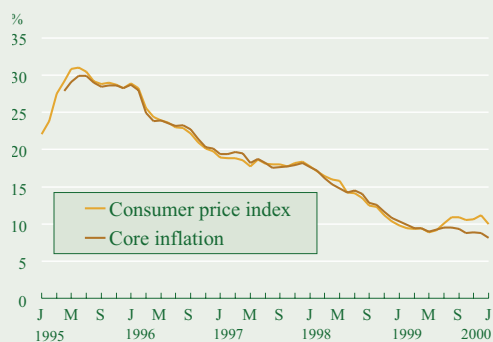
This requires seemingly contradictory behaviour from the central bank in its reactions to external **shocks** which influence inflation. While it attempts to accommodate favourable external shocks that

mitigate inflation (e.g. reduction in world market energy prices, lower rate of inflation among trading partners), it resists ones which would increase it, such as unsustainably high economic growth or fiscal pressures. The slowdown in inflation in 1996–97 indicated that the inflationary shock generated by the 1995 stabilisation measures was dying down: the stringent fiscal, income and monetary policy mix did not accommodate the higher level of inflation. Inflation expectations also moderated gradually with the decline in inflation.

The NBH attempted to lock in the disinflationary gains coming from the slump in world energy and food prices in 1998 through reducing the devaluation rate of the forint more rapidly than before. (See Figure 1)

In curbing inflation, attention must also be paid to the real economic costs of doing so. These may be significant, particularly when the anti-inflationary policy lacks credibility. The country's foreign debt and additional external financing needs also constrain attempts to reduce inflation.

**Figure 1** Changes in the consumer price index and in core inflation in Hungary (month/same month of the preceding year)



The methodological description of core inflation calculated by the NBH can be found in the September and December 1999 issue of the "Quarterly Report on Inflation".

### *The Role of the External Equilibrium*

External equilibrium has been traditionally a concern for Hungary's monetary policy. The maintenance of external equilibrium is *prima facie* not a typical central bank objective, but in Hungary's case it is inseparable from the objective of reducing inflation and achieving **price stability**. Hungary is a **small open economy**, where tensions arising from imbalances in domestic production and absorption typically first lead to the deterioration of the current account. Inflationary pressures only appear later when measures (such as devaluation, the raising of customs duties and taxes, etc.) are taken to address the problem of external disequilibrium. Hungary's relatively high foreign indebtedness and the use of the nominal exchange rate as an intermediate target of monetary policy further limit the extent to which the NBH can tolerate fluctuations in the balance of payments and the real exchange rate.

The objective concerning the external equilibrium cannot be expressed as a single figure. The central bank aims to achieve and maintain a level in the **current account** balance, competitiveness (real exchange rate), debt indicators and foreign exchange reserves, which are aligned with the long-term macroeconomic course of the economy.

The predictable nature of the Hungarian exchange rate regime (narrow band, the rate of devaluation announced in advance) and the nominal exchange rate target (see the next chapter on "Intermediate Targets") in themselves justify the emphasis monetary policy places on indicators of external equilibrium.

With the introduction of the crawling peg exchange rate regime, the NBH's ability to avoid a forced devaluation of the forint or a widening of its exchange rate band has risen to paramount importance in preserving the credibility of economic policy. Such speculative attacks can be best pre-empted by keeping economic funda-

mentals that influence external equilibrium and competitiveness sound, and by holding adequate levels of foreign exchange reserves, which enable the central bank to meet its obligation of intervention.

The various **real exchange rate** indicators faithfully track the evolution of the domestic export and import sector's competitiveness, which is a crucial determinant of the country's external balance from the real economy side. Because of this, preventing the excessive real appreciation of the forint is an important goal of the central bank.

The fact that while Hungary's economy is catching up with more advanced economies its productivity growth will outstrip that of its trading partners is, however, not ignored. This process inevitably leads to the appreciation of the real equilibrium exchange rate. Though neither this equilibrium level, nor the requisite magnitude of the real appreciation in a given period can be accurately quantified, it is certain that a drastic and sustained real appreciation must be avoided by all means. The central bank's views concerning the desirable extent of real appreciation can be seen from the discrepancy between the announced rate of devaluation and the expected rate of inflation. The forint's fluctuations within the band carry no information concerning the central bank's intentions.

The weight of the indicators of external debt, particularly of the state's foreign exchange debt, is still higher in the "objective function" of the NBH than in that of the central banks of advanced countries. This is a heritage of the past. In the early 1990s, practically only the state had access to the international capital markets, thus the NBH raised all the foreign funding that the economy needed. Today, with the liberalisation of the greater part of current account operations, economic agents are able to do so on their own. This process is also reflected in the changing structure of Hungary's foreign exchange debt: the share of the state has declined, while that

of the private sector has increased. Markets pay special attention to the foreign exchange debt of the state because the private sector is thought to assess and manage risks associated with increasing its liabilities more adequately.<sup>2</sup>

In advanced industrialised countries the share of national debt denominated in foreign exchange is low, which means that depreciation or devaluation of the exchange rate does not significantly worsen a country's fiscal balance and the authorities can leave it to the markets to re-establish external equilibrium at relatively low cost by giving up the **fixed exchange rate regime**.

In Hungary's case, however, the government would need to raise foreign funds to meet its debt obligations even under a floating exchange rate regime (although to a much lesser extent than before), hence a forced abandonment of the fixed exchange rate regime would have high economic costs. Not only would the forint value of the foreign exchange component of debt service increase substantially but, owing to the

higher perceived **exchange rate risk**, domestic interest rates would rise as well, putting further strain on the government budget.

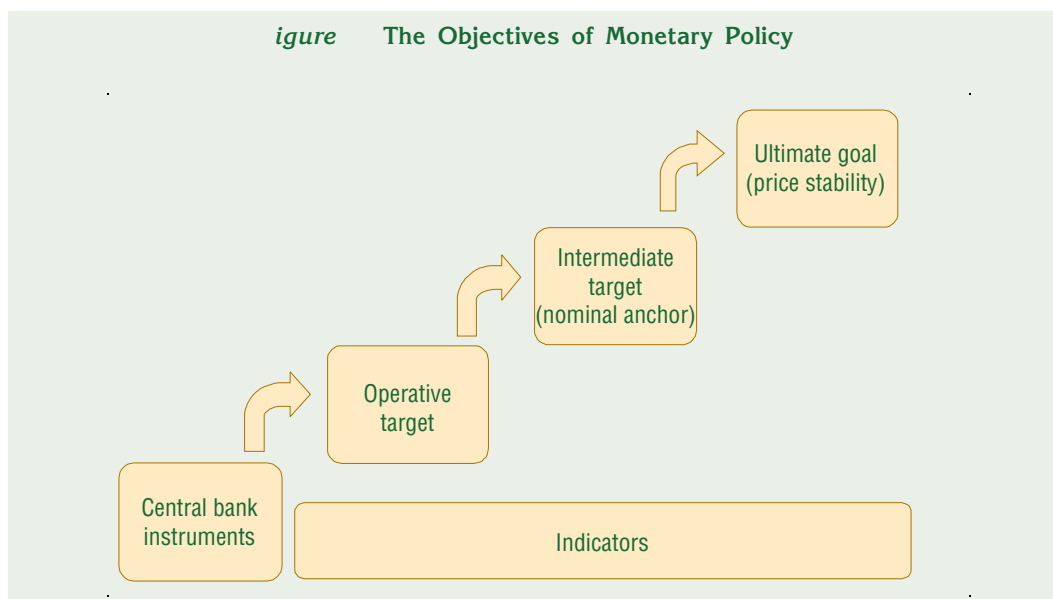
To re-establish fiscal balance, it would be inevitable to raise taxes and curb expenditure. Ultimately this would lead to a renewed increase in inflation and a halt in economic growth. For this reason the NBH must take a much tougher stance on signs of declining competitiveness than its counterparts in more established economies and it can use the current account to only a lesser extent as a buffer against negative shocks.

## Intermediate Targets

### The Hierarchy of Objectives

All this is to say that the implementation and maintenance of price stability can be regarded as the ultimate goal of monetary policy (see *Figure 2*). The instruments avail-

Figure 2 The Objectives of Monetary Policy



<sup>2</sup> Yet the Asian crisis demonstrated that even this is relative.

able to the central bank, however, are unable to exert a direct and immediate impact on the price level.

The connection between the ultimate goal and the instruments of the **monetary authority** is rather indirect and also depends on stochastic factors. In addition, monetary policy decisions taken today will have an impact with a time lag, which may frequently involve years. Owing to the complicated nature of the relationship between the instruments and the ultimate goal of monetary policy, central bank decision-makers closely track the evolution of variables that play a role in the *transmission mechanism* and serve as a link between the instruments and the ultimate goal.

These variables can be put in the categories of *intermediate target*, *operating target* and *indicators*.

The *intermediate target* is an economic variable, which is closely related to the ultimate goal but can at the same time be relatively well influenced by the instruments of monetary policy. In general, the growth rate of the money supply in the economy or the exchange rate is chosen as such a target. Central banks tend to determine target values for the intermediate targets with respect to the future.

The level of the target values is determined so as to be optimal from the viewpoint of the ultimate goal; then the central bank attempts to influence the intermediate target variable with the instruments available to it so that it should meet the designated target value.

A properly chosen intermediate target can be better controlled by the central bank than the ultimate goal itself; at the same time, the intermediate target reflects the changes in the external factors (that is, factors, outside the control of the central bank) influencing the ultimate goal even before they would actually influence the price level. With the help of a well selected intermediate target, the central bank can, for instance, introduce measures to stabilise the price level even before the unfolding of an inflationary shock.

### *The Nominal Anchor*

In general, the **intermediate target** serves as a *nominal anchor* for economic agents. The **nominal anchor** is an economic variable capable of stabilising the expectations of economic agents (producers, consumers, employers, employees, etc.) with respect to future inflation.

When the nominal anchor is credible, i.e. economic agents have confidence in the capability of the monetary authority to meet the intermediate target, they will form their inflation expectation in accordance with that anchor. This can be of tremendous assistance to the central bank particularly when it sets out to establish price stability after a prolonged inflationary period. By using a credible nominal anchor and cooling overheated expectations of inflation, the monetary authority may substantially mitigate the economic and social costs of reducing inflation.

### *Choosing the Intermediate Targets*

One of the possible intermediate targets is the amount of money available in the entire economy and its growth rate. According to the tenets of classical economics, there is an unambiguous congruence between the money supply and the price level, hence the central bank is able to control the price level through influencing the money supply. The use of the money supply as an intermediate target was a popular instrument among central banks until the 1980s. In the course of the 1980s, however, many a central bank saw that the causal relationship between growth in the money supply and inflation, which used to function well previously, was upset and they were unable to control the price level through the money supply. This failure could be attributed primarily to financial innovation: paying interest also on sight deposits and the increasingly intensive use of the various means of cashless payment (e.g. credit cards) led to an erosion of the boundaries between cash

and non-cash type instruments, thus central banks were less and less able to influence broad money. Consequently, central banks in several countries (including the United States and the United Kingdom) gave up the system of monetary control based on the money supply.

In the case of countries running a fixed exchange rate regime, the *exchange rate* plays the role of the intermediate target. Pegging the exchange rate is generally applied by countries having a small, open economy. By pegging its currency to that of a large country enjoying a stable price level, the central bank practically “imports” the low rate of inflation of the large country. In addition, pegging the exchange rate substantially reduces the risks arising from exchange rate fluctuations, which may facilitate the development of foreign trade as well as international investments. In return for these advantages, fixing the exchange rate presupposes adjustment to the monetary policy of the large country, which is not advantageous when the two countries are subject to different economic shocks.

From the end of the 1980s, several central banks switched to the system of direct *inflation targeting*. In this framework of monetary policy, the central bank undertakes an explicit commitment to maintain the rate of inflation within a given target band. Here, the inflation forecast produced by the central bank plays the role of the intermediate target. The inflation forecast meets the characteristics expected from an intermediate target because it is closely related to the ultimate goal and it can be influenced by the central bank because, when producing the forecast, the central bank instruments are also taken into account. Thus, in parallel with the steps of the central bank, the forecast is also modified. The system of **inflation targeting** proved to be an efficient anti-inflationary instrument in a number of countries. Its application, however, presupposes that the central bank establish its own **credibility** in the eyes of society. In

addition, the mathematical econometric models used for producing inflation forecasts can be used effectively only in the countries where adequately long, uniform data series are available about the economic processes.

### The Intermediate Target of the NBH

A number of intermediate targets are used in international practice. For today’s Hungarian economy the one that has the most favourable characteristics is the *nominal exchange rate*. The popularity of the exchange rate target, particularly in emerging economies, can be frequently explained by the absence of the conditions for alternative monetary regimes.

In Hungary, for instance, the instability of the money demand function in the period of the transition ruled out monetary targeting as an option for the central bank. It is therefore not by chance that the NBH has used the exchange rate as its intermediate target since the birth of the **two-tier banking system**.

The use of the nominal exchange rate or exchange rate path as the intermediate target has several advantages. The exchange rate directly influences the price of traded products. Also, provided that the exchange rate target is credible, the pre-announced devaluation rate (in the case of a crawling peg regime) may efficiently condition inflation expectations and the prices of non-traded products and services. A credible exchange rate target means that the exchange rate will evolve along a foreseeable path and therefore is not an additional source of uncertainty affecting returns on investments.

The exchange rate path as an intermediate target has yet another advantage, namely, that it is *transparent*: all economic agents can continuously observe it. The relationship between the exchange rate and the rate of inflation is widely known among economic agents, therefore the exchange

rate target is capable of anchoring their inflation expectations.

The public's ability to continuously monitor whether or not the central bank meets its target enhances the central bank's accountability, which in turn boosts its credibility and the public's confidence in economic policy.

Exchange rate targeting is not synonymous with maintaining a **fixed-type exchange rate regime**. Several countries pursue an exchange rate target even with formally more flexible exchange rate regimes (floating, wide-band exchange rate regimes) and maintain a form of implicit exchange rate band or limit the actual movements of the exchange rate through managed float.

A fixed exchange rate or a narrow exchange rate band is, however, a stronger commitment to implementing the exchange rate target, consequently its ability to orient expectations is stronger.

### *The Pre-announced Crawling Band Exchange Rate Regime*

The crawling band regime, introduced in March 1995, allowed economic policymakers to reconcile as much as possible the often conflicting objectives of fostering growth and reducing inflation. Pegging means that a country sets a fixed value for its currency vis-à-vis the currency of a large, low inflation economy.<sup>3</sup> With a fixed exchange rate, domestic inflation ultimately and gradually approaches the inflation of the country of the anchor currency; yet international experience shows that this convergence tends to be rather slow and the costs of disinflation can be substantial.

In the wake of several unexpected devaluations the earlier fixed, but adjustable exchange rate regime lost its credibility. The evolution of the exchange rate was unpre-

dictable and economic calculations could not be based on it.

Regular devaluation resulted in disruptive speculation that threatened the financial system and also perpetuated higher inflation. Hungary needed an exchange rate regime which was predictable, helped disinflation, but also allowed the economy to run a higher rate of inflation than its main trading partners for a sustained period of time. The examples of Chile, Poland and Portugal, among others, demonstrated that the crawling peg/band exchange rate regime fulfilled these expectation. (See Figure 3)

The use of the exchange rate as the **nominal anchor**, the predictability of devaluation coupled with stringent fiscal and income policies opened up the way to gradual disinflation. Announcing the rate of devaluation in advance (first until the end of 1995) assisted in making expectations forward-looking, and the restrictive fiscal and income policies pursued guaranteed that the surge in inflation induced by cost-side pressures created by the radical stabilisation measures remained temporary (and was not in excess of what cost side pressures warranted) and could be gradually reversed following the shock.

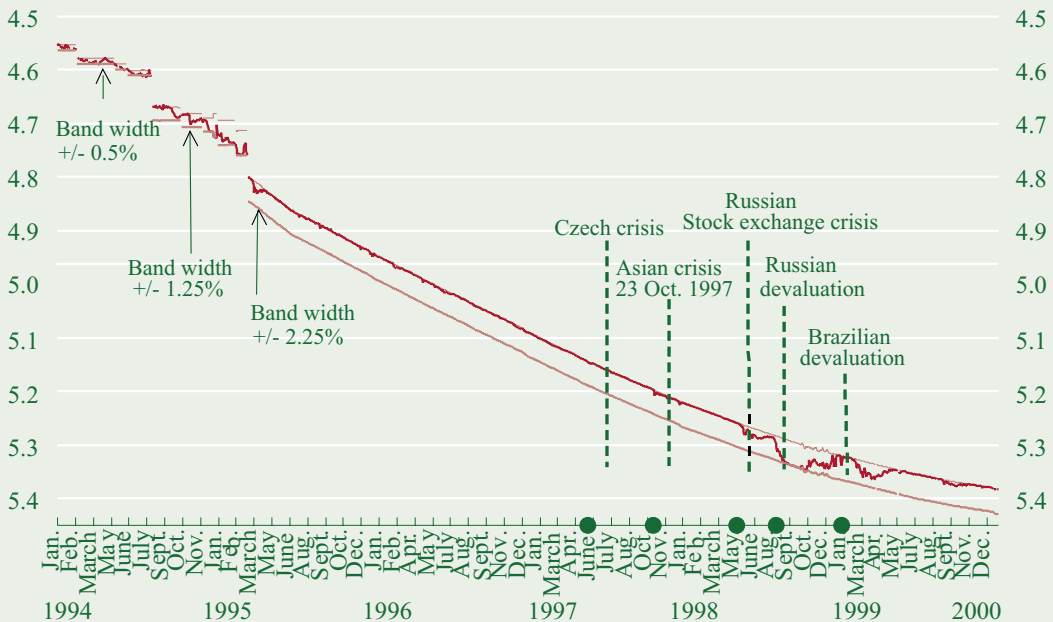
This significantly contributed to solidifying the **credibility of economic policy**. Under the pre-1995 exchange rate regime, investors expected higher yields from forint denominated financial assets owing to the uncertainties surrounding the date and magnitude of prospective devaluations: forint yields contained a substantial **premium**. This was particularly burdensome for the budget, the state being Hungary's largest debtor. The success of the stabilisation measures and the impeccable track record of the exchange rate regime reduced this premium for the risk of an unexpected exchange rate realignment to a negligible level.

The other component of **exchange rate risk**, the possible change of the exchange rate within its fluctuation band, remained, but, until the end of 1997 it was not considered to be significant as the exchange

<sup>3</sup> Or to a currency basket, but this does not alter the heart of the matter.

**Figure The Exchange Rate of the Hungarian Forint, January 1994–January 2000**

The logarithm of the basket exchange rate (reversed scale)



Composition of the basket: August 1993–May 1994: 50% DEM 50% USD. May 1994–December 1996: 70% ECU 30% USD. January 1997–December 1998: 70% DEM 30% USD. January 1999–December 1999: 70% EUR 30% USD. Since January 2000: 100% EUR

rate stayed almost permanently at the strong edge of the band. The country's foreign exchange default risk also declined rapidly after the introduction of the new regime. The reduction in the risk premium and the concomitant decline in domestic interest rates contributed to the acceleration of growth and helped reduce the fiscal deficit.

### *The Constraints of a Monetary Policy in Pursuit of an Exchange Rate Target*

A fixed exchange rate regime limits monetary policy's ability to set interest rates and pursue domestic macroeconomic goals independent of monetary conditions outside

the country. This also holds for a crawling peg regime.

A rise in domestic rates nudges the excess return on the local currency over foreign assets higher and leads to substantial capital inflows and **surplus liquidity**, unless the devaluation rate is also increased simultaneously.

The monetary tightening imposed through the interest rates channel is then, however, offset by the loosening through the exchange rate channel. (With a higher rate of devaluation the real exchange rate is also temporarily devalued due to the stickiness of prices.) In such a situation the burden of monetary tightening falls on companies which are not exposed to competition in external markets and so are less sensitive to changes in exchange rates (the

non-tradable sector), because for companies that sell to export markets (the *tradable* sector) the devaluation of the exchange rate neutralises the restrictive impact of higher real interest rates on **monetary conditions**. This also means that should other elements of economic policy generate **inflation expectations** that are not consistent with the announced rate of devaluation, monetary policy, under the current exchange rate regime, could not in itself counter these inflationary tendencies. But even under a more flexible exchange rate regime monetary policy cannot suppress inflationary pressures, if all other components of economic policy work in the opposite direction. Thus the consistency of economic policy, particularly of monetary and fiscal policy is of paramount importance for Hungary.

Another problem with the fixed-type exchange rate regime is that shocks that impinge on the economy of the anchor currency are directly transmitted to the country pursuing the exchange rate target, because domestic interest rates must remain aligned with foreign rates.

The ERM was plagued by exactly this phenomenon in the wake of Germany's sustained monetary tightening which attempted to counter the impact of the expansionary fiscal policy which reunification necessitated and of the erroneous conversion rate applied to the East German Mark. Other countries in the ERM were also pressured to raise interest rates and pursue a monetary policy which was more stringent than what domestic processes would have warranted. The ERM crisis occurred because some of the countries were unwilling to further increase domestic interest rates and bear its economic costs.

An improvement in debt indicators, the growth in foreign exchange reserves and the economic stability of a country are not always sufficient safeguards against capital flight and speculation against the exchange rate. The central bank at such times can demonstrate its commitments to the fixed exchange rate by raising interest rates, thereby stating that it is not deterred by the

economic costs of defending the exchange rate regime. The possibility of raising interest rates notwithstanding, the central bank needs to maintain a level of foreign exchange reserves deemed sufficient to ward off unfavourable external shocks. What level is considered sufficient is determined by the **current account** position, the intensity and continuity of capital inflow, and the stock of state debt to foreigners.

A fixed exchange rate poses additional threats to countries with high foreign exchange debt and to ones that are importers of capital. Through its promise to maintain the exchange rate regime, the central bank provides insurance against exchange rate risks to the economy. When economic prospects are uncertain and longer maturity instruments are not available in the domestic currency, companies, banks and even the state find it easier and cheaper to borrow in foreign markets, which may lead to a substantial build-up in foreign currency *open positions*. In a situation like this the economy could incur tremendous losses on these open positions should a devaluation occur, leading to a financial crisis and recession. From this point of view, the increased volatility of the forint during the Asian and Russian crises was beneficial for Hungary's financial markets, because they prompted economic agents to assess risks more thoroughly and to hedge them more prudently.

## The Lower Level of the Set of Objectives

In addition to the **intermediate targets**, the majority of central banks also use *operating target variables*. Most of the time this role is played by short-term money market rates. There are two fundamental differences between the **operating target** and the intermediate target. On the one hand, the operating target has, generally, a direct relationship



with the available instruments of the central bank, so monetary policy steps are immediately reflected in the values of the operating target variables, while in the case of intermediate targets this usually takes some time. On the other hand, in most cases the operating target is unable to fill the role of the *nominal anchor*.

*Short-term interest rates* are suitable as operating targets because they play a priority role in the impact mechanism of monetary policy. Most corporate credits bearing variable interest are linked to some short-term rate, thus the central bank is able to directly influence the liability costs of companies and consequently the demand for investment goods by influencing the level of these interest rates. In addition, the rates on household deposits also tend to follow changes in short-term rates. By controlling household rates, the central bank influences the public's decisions on saving and consumption. Therefore, by influencing interest rates, the central bank is able to influence the **aggregate demand** for investment and consumer goods throughout the economy. The level of short-term rates (or to be more precise, the real yield that may be achieved on short-term rates) provides information concerning the **restrictive** or **expansive** nature of monetary policy.

In countries employing a floating exchange rate regime, monetary policy decisions affect aggregate demand not only through interest rate movements but also through shifts in the exchange rate. In small, open economies where the weight of foreign trade in the national economy is very high and the effect through the exchange rate is considerable, the level of short-term rates does not characterise the restrictive or expansive nature of monetary policy to an adequate extent. In some countries, therefore, the weighted average of short-term rates and the exchange rate are used as an operating target. This is referred to as the *Monetary Conditions Index (MCI)*.

*Indicators* are macroeconomic variables which provide a signal concerning the expected development of the ultimate goal

variable; at the same time, it is not a direct and declared objective of monetary policy to influence them. Such a variable can be the difference between long-term and short-term rates, changes in industrial output, or the agricultural price index, etc. The indicators, however, assist in the choice of the central bank's steps by enabling the central bank to take the measures that best serve the different purposes; at the same time, the central bank's policy has no intention to directly adjust the values of the indicators.

With the help of the *central bank's monetary policy instruments*, the monetary authority is able to directly influence the amount and/or cost of bank money available to commercial banks. Through these instruments, the central bank is at the same time able to exert an indirect influence on the other elements of the set of objectives: the operating and intermediate targets and the ultimate goal. A detailed description of the *central bank instruments* is presented in the last chapter.

## The Operating Target of the NBH

The interest rate moves of the NBH, which tend to track changes in market yields, attempt to meet the dual objective of maintaining domestic *real interest rates* at a level high enough to keep savings at the level consistent with external equilibrium and disinflation, and of keeping returns on Hungarian securities for foreign investors aligned with the expected returns in that asset class. The latter means that domestic interest rates adjusted for the announced devaluation rate contain a sufficiently high premium over foreign interest rates to keep the exchange rate of the forint within its band.

The NBH uses the rate on its two-week (earlier one-month) deposit facility to steer market yields, especially the 3–6-month interbank and government security market yields, which it views as the most important determinants of both domestic savings and of the volume of interest rate sensitive capi-

tal flows, which strongly influence the exchange rate.

With the liberalisation of money and capital markets the relationship between domestic and foreign interest rates became tighter through unhedged interest rate parity, reducing the NBH's room for manoeuvring in setting interest rates. Under the crawling peg regime the central bank's independence in setting interest rates is determined by the exchange rate and the country risk that investors perceive and the width of the exchange rate's fluctuation band. When interest rates fail to coincide with the yields expected by foreign investors – for instance, because of changes in the risk premium – the forint moves within the exchange rate band and eventually, in case of a significant

misalignment, foreign exchange intervention evolves at the edges of the fluctuation band.

The NBH sterilises the liquidity effects of its **foreign exchange market interventions** through its deposit facilities, bonds and open-market operations performed with government papers. *Sterilised intervention* stabilises the monetary base in periods of substantial capital flows and gives some latitude to the NBH to set interest rates with a focus on developments in the domestic economy. Since the spring of 1998, the NBH has allowed longer term yields to be determined by market forces and fixed the interest rate only on its short term sterilisation instruments. Longer maturity NBH bonds have been offered in free tenders.

## Monetary Aggregates

Excessive money supply may increase inflation and deteriorate the current account. Consequently, monetary policy always, even when it does not specify a money supply target, attempts to prevent excessive expansion of monetary aggregates. However, the exchange rate regime significantly influences the autonomy of monetary policy and the role of the monetary aggregates in policy formation. The exchange rate of the forint plays the role of an intermediate target in the current Hungarian system. The exchange rate system is a crawling peg, and the NBH has no explicit money supply targets. Nevertheless, in examining the net **financing requirements** of the corporate and the households sectors, the central bank pays particular attention to the analysis of claims belonging to different money categories.

Various components of money, such as banknotes and coins, cheques, foreign exchange, current account, time deposit, certificate of deposit or bank bond, etc., appear on the liability side of a bank's balance sheet. The monetary aggregate, containing the liability-side items of the central bank's balance sheet, represents the *monetary base*, while the liabilities of the consolidated balance sheet of the banking sector lead to a wider definition of the *money supply*. The money supply taken in the broadest sense, points beyond even the banks' balance sheets, is also used.

The monetary base is an important **indicator** for monetary policy because this is the only monetary aggregate which is directly controlled by the central bank and, at the same time, this is the category which, through the money multiplier, constraints the money supply in the economy. Consequently, changes in the monetary base indirectly influence economic activity; it influences **inflation**, the interest rates and the current account. *The monetary base marked as M0 consists of cash outside the central bank and banks reserves held at the central bank.*

Funds of credit institutions placed at the central bank are usually regarded as part of the monetary base depending on whether or not they constitute a basis for money multiplication. The central bank may control the impact of foreign capital inflow on the money supply by using various instruments of sterilisation. Sterilisation instruments and the commercial banks' foreign exchange deposits kept at the central bank, although they are liabilities of the central bank's balance sheet (*see Figure 4*) as they do not participate in money multiplication, they are not considered to be components of the monetary base.

The averaging period for commercial banks **required reserves** is one-month. Accordingly when calculating the monthly monetary base, as currently published by the NBH, the end-month stock of cash in circulation is added not to the end-month stock of reserves and other forint accounts of the credit institutions held at the central

*Figure The Balance Sheet of the  
of the*

		Forint billion	
E.1. Refinancing credits	130	Monetary base (M0), (F.1 + F.2)	1,323
		F.1. Cash	833
E.2. Net lending to government	1873	F.1.1. Vault cash	73
		F.1.2. Cash outside the banking system	760
E.3. Net foreign assets	915	F.2. Banks' reserves	490
		F.2.1. Required reserves	485
E.4. Net other items	-458	F.2.2. Free reserves	5
		F.3. Foreign exchange deposits of banks kept with the NBH	619
		F.4. Sterilisation instruments	518

bank, but to the average of the reserve period.

The relationship between the liability side of the central bank's balance sheet and the liability side of the consolidated balance sheet of the banking sector represents the impact of monetary policy on money supply. This relationship is described by the money multiplier. Changes in the money multiplier can be traced back to changes in the share of cash (cash related to the banks' liabilities) and the reserves ratio (the reserves relative to the banks' liabilities).

Money multiplier = Broad money / Monetary base = M3 / M0

where the money in circulation can be expressed as the sum of cash and other bank liabilities. When both the numerator and the denominator are divided by the amount of banks' liabilities, then

Money multiplier = (KP / BF) / (KP / TR) = (KP / BF) \* (TR / BF)

where KP = cash,

TR = required reserves at the central bank, and

BF = commercial bank liabilities.

The formula above shows that money multiplier increases with the decline of the reserve requirement (TR/BF), hence the reserve requirement ratio limits the money creation. Money multiplier also moves in an

inverse proportion with changes in the share of cash (KP/BF): the money multiplier declines when the share of cash in the banks' liabilities increases.

Broader monetary aggregates can be constructed using items on the liability side of the consolidated balance sheet of the banking system. When consolidating the balance sheets of the central bank and the commercial banks, the money operations of the central bank and the commercial banks with one another are netted out, thus the central bank's **refinancing credit allocated** to commercial banks is no longer included in the consolidated balance sheet of the banking sector. Similarly vault cash, banks' reserves and the sterilisation instruments kept at the central bank cancel each other on the commercial banks and central bank balance sheets (see Figure ).

The various monetary aggregates can be defined according to the degree of liquidity of assets. The supply of M1 includes the perfectly liquid means of payment, that is, those forms of money which meet the payment function without any limitation. M1 includes cash in circulation and household, corporate or municipal current accounts, transfer accounts and checking accounts.

*M3 or broad money* in addition to *M1* also covers the items that directly fulfil the function of money and can be turned into cash relatively easy. These additional items include fixed forint deposits and foreign exchange deposits, which are the so-called quasi money. In addition to all of this, *M3* also contains those financial assets, which, with respect to their form, are not

bank accounts but represent *other bank securities*, certificates of deposits, letters of savings or bank bonds.

Hungarian monetary statistics *do not calculate M2*, the monetary aggregate generated as the sum of narrow money (*M1*) and quasi money (that is the category similar to *M3*, but from which bank securities are excluded). The reason for this is that several

*figure* The Balance Sheet of Commercial Banks  
30 November 1999

		Forint billion	
E.1. Credits	3,847	F.1. Forint deposits	3,378
E.1.1. Credit to households	461	F.1.1. Sight deposits	1,179
E.1.2. Credit to corporations	2,323	F.1.2. Time deposits	2,200
E.1.3. Credit to municipalities	48		
E.1.4. Net credit to general government	1,015	F.2. Foreign exchange deposits	904
E.2. Vault cash	73	F.3. Bank securities	51
E.3. Banks' reserves at the central bank	490		
E.4. Banks' foreign exchange deposits placed at the NBH	619	F.4. Refinancing credits	130
E.5. Sterilisation instruments	518		

*figure* Consolidated Balance Sheet of the Banking System  
30 November 1999

		Forint billion	
E.1. Credits	5,720	Broad money (M3 (F.1. F.2. F.3.))	5,094
E.1.1. Credit to households	461	F.1. Narrow money (M1)	1,939
E.1.2. Credit to corporations	2,323	F.1.1. Cash outside the banking system	760
E.1.3. Net credit to general government	2,935	F.1.2. Sight forint deposits	1,179
E.2. Net foreign assets	-125	F.2. Quasi money	3,103
		F.2.1. Term forint deposits	2,200
		F.2.2. Foreign exchange deposits	904
E.3. Other assets	-501	F.3. Bank securities	51

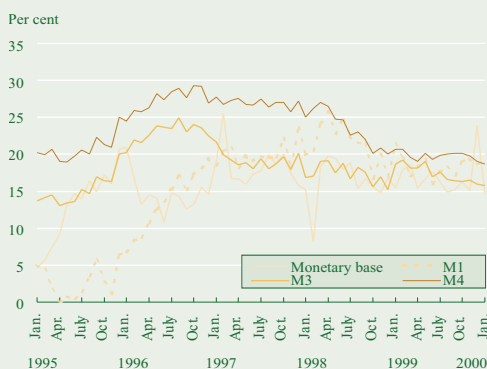
bank securities do not differ from term deposits in terms of maturity or **liquidity**. So by function they are not real securities, but they are rather similar to deposits. The difficulties involved in separation of these makes the calculation of M2 less meaningful, consequently only M3 is published in the Hungarian practice.

An even wider money category, *M4*, goes beyond the consolidated balance sheet of the banking system and in addition to M3 it also includes non-bank instruments like the stock of government papers and the bonds issued by the NBH and held by agents outside the banking system.

Although bonds issued by the NBH could be included as part of M3 as bonds of financial institutions, they are, nevertheless, presented under the broader money category M4 reflecting the fact that the central bank bonds are largely substitutes for government papers of the same maturity bearing the same risk (in the final analysis, the ultimate debtor is the state as the shareholder of the central bank).

As M4 covers all forms of savings, it is not sensitive to portfolio rearrangements, consequently it is the most stable monetary aggregate (see Figure 7).

**Figure 7 Growth Rates of the Monetary Aggregates Relative to the Same Date of the Preceding Year**



## Credit Aggregates and the Net Financing Capacity

Similarly to monetary aggregates, NBH has no target concerning the stock of credit under the current framework of the monetary policy. Yet changes in the stock of credit may signal important information on the changes in the environment of monetary policy. Normally, the central bank does not concentrate solely on credit when analysing the effects of credit on the money supply and on the balance of investments and savings. Analysis of changes in the credit portfolio is linked to the examination of the consolidated balance sheet of the banking sector and the **net financing capacity** of major sectors.

*Net financing capacity* of a given sector means the balance of transactions related to the claims and liabilities of the sector. The *balance of transactions* corresponds to the increment in the stock of claims and liabilities net of the exchange rate and other volume changes.

The balance of transactions linked to the claims of *households* normally exceeds that of transactions linked to the credits of the sector, hence the households sector, is net lending. In the case of the corporate sector, however, the situation is exactly the reverse: owing to the net inflow of external funds to finance investments of the sector, so the *corporate sector is net borrowing*.

The net lending/borrowing balance of the domestic sectors is equal to the foreign financing requirement, which corresponds to the deficit in the current account. Accordingly, the changes in the **current account** deficit may be broken down to the changes in the net lending/borrowing position of the various domestic sectors.

Under the current exchange rate system the central bank monitors the credit allocation to corporate and households sectors because it influences the financing capacity at these sectors as well as the current

account. Faster credit growth also influences **inflation** through investment and consumption demand, but at a quasi fixed exchange rate a substantial portion of the inflationary impact finds its way only after the unavoidable devaluation, a result of the deteriorating current account deficit caused by the credit expansion.

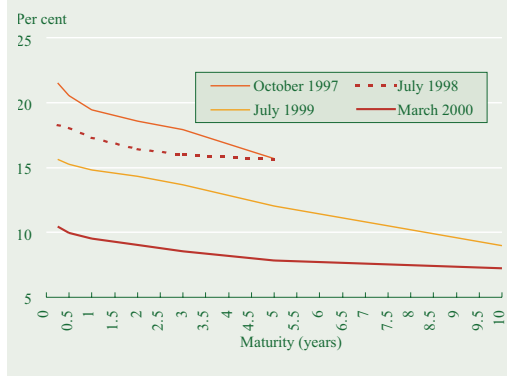
## The Information Content of the Yield Curve for Monetary Policy

The term “**yield curve**” (or “term structure of interest rates”) refers to the relationship between interest rates of different maturities. In most cases, when yields of different maturities are compared, investments with the same risk level<sup>4</sup> are considered. The analysis of the yield curve provides important information in relation to expectations concerning the future evolution of **inflation**, **real interest rates** and growth. In addition, the yield curve is a useful signal for the central bank concerning the effectiveness and credibility of the monetary policy it pursues.

In properly functioning money and credit markets, monetary policy with the help of an appropriately designed set of **monetary policy instruments** has a significant impact on the shorter maturities of the yield curve in the case of both structural liquidity surplus and shortage.<sup>5</sup> Short-term is generally interpreted as up to one year. (See Figure 8)

Yields on longer maturities, however, are strongly dependent on expectations concerning future interest rates. In countries with developed financial markets, the central bank, although able to influence the yield curve, is unable to keep it fully under control: on maturities longer than 3–6 months, the central bank is unable to maintain interest rates different from

Figure 8. Zero-Coupon Yield Curves in Hungary at Various Points in Time



market expectations in a sustained manner.

Longer maturities are not influenced directly through the control implemented through the set of instruments but through the signals concerning the (future) conduct of monetary policy. By “signals”, we mean changes in the policy, i.e., very short-term interest rate.

The interpretation of the interest rate measure and its reasoning provides information to economic agents concerning the position taken by monetary policy, who will develop their expectations concerning future inflation, nominal and real interest rates on that basis. That is to say, change in longer-term rates is a function much more of the expectations of economic

<sup>4</sup> Market agents and the central bank generally examine the structure of the yield curve obtained from the risk-free government paper market yields because high-frequency price information observed easily and accurately can be provided best by the government paper market.

<sup>5</sup> According to the Hungarian terminology, we speak about an active-side regulation when, characteristically, the banking sector struggles with a structural **liquidity shortage** for administering payments and in obtaining central bank money required for meeting the reserve requirement (wherever it exists). Then the central bank effects liquidity and short-term yields using its credit-side instruments. In the opposite case, when (“passive-side regulation”), the banking sector is in structural liquidity surplus on central bank money and the central bank withdraws the excess liquidity through its facilities of deposit acceptance in the course of which it also determines short-term yields.

agents than of the **short-term** rates of central banks.

### Yield Curve Theories

The interpretation of the shape (slope) of the **yield curve** is not unambiguous, basically it depends on economic theory. Testing of the theories has revealed that not even the most widely accepted theories hold true in all markets and at all times, nevertheless, they provide some kind of a basis for interpretation. In the course of the comparison of rates on various maturities, that is, the interpretation of the shape of the yield curve, most frequently three theories are mentioned.

According to the *expectations hypothesis*, the yield curve reflects the expectations of market agents concerning future inflation. Nominal yields are usually observed also as **indicators** of economic activity because present yields of vigorously positive slope can be interpreted as harbingers of higher economic growth and higher inflation. The current Hungarian situation (i.e. a yield curve with a negative slope) does not mean, however, that economic agents anticipate a recession. What stands behind the phenomenon is that the continuous decline in inflation over the past few years contributes to the reduction of inflation and interest rates expected in the future, which is stronger than the impact of economic growth on the yield curve.

By comparing rates on various maturities, rates expected in the future (implicit **forward rates**) can be calculated from the spot yields (from the shape of the yield curve). A spot yield curve of negative slope renders a future decline in short-term rates probable. Naturally, there is nothing to guarantee that we shall be able to actually observe these rates in the future but, according to this hypothesis, this is the best estimate that we can make based on information available in the present.

According to the *liquidity preference* theory, investors are willing to accept lower yields on short term investments because they regard shorter-term securities as less risky (as compared to longer term investments). Shorter-term investments can be advantageous for two reasons: first, they offer greater liquidity, second, their price is less sensitive to interest rate fluctuations. Ac-

ording to this theory, these two effects overcompensate for the disadvantage that, by purchasing shorter-term papers, by the more frequent roll-over of investments, it is necessary to assume the risk of renewal: we undertake uncertainties in relation to the yield of investments to be made in the future. Investors therefore invest for the longer term only when they can achieve a higher yield. Therefore, the theory makes a yield curve of a positive slope probable.

The third theory is referred as the *market segmentation* theory. It presupposes that various maturities have their own separate markets and the yields on individual maturities evolve as a result of equilibria evolving independently of one another. In other words, the slope of the yield curve is determined by the investors' term preferences.

This approach is criticised largely because of its excessive discretion in distinguishing individual maturities. If we accept the probable assumption that individual investors are willing to deviate from the investment period they would otherwise prefer against an adequate consideration, i.e. **yield premium**, then we arrive at the *theory of preferred habitats*. The theory of preferred habitats says that yields on individual maturities evolve subject to what maturities investors prefer the most and for what premium they are willing to deviate from that preference in a specific direction.

From the viewpoint of monetary policy, *knowing the inflation expectations* of market agents is useful for several reasons. First, this provides additional information concerning the expected real economic effects of monetary policy steps because, for instance, unexpected price changes have a much greater real impact. Thus, to be able to forecast the expected real effects of anti-inflationary policy, we must have reliable estimates about the inflation expectation of market agents. Second, these expectations play an important role in the assessment of the **credibility** and effectiveness of monetary policy. When an anti-inflationary policy is successful, long-term expectations of inflation and nominal rates are low.



A common method of analysing expectations is the analysis of *implicit forward yields*. Forward yields can be calculated by comparing the rates on various maturities, which are normally broken down into expected inflation, real interest rates and **premium**<sup>6</sup> for the purposes of the analysis.

A decline in long-term rates indicates the credibility of the anti-inflationary policy and expectations of low inflation and interest rates, while their rise points towards an increase in inflation (and interest rates) expected in the future (see Figure 9).

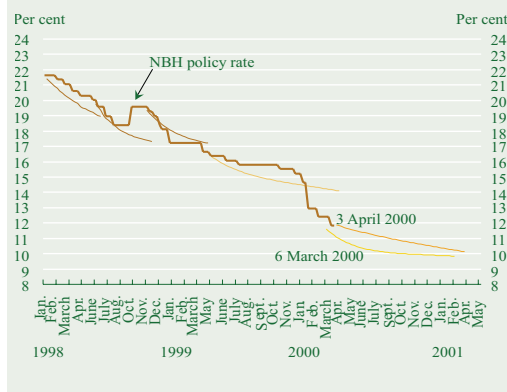
One can draw conclusions concerning inflation expectations and real interest rates when assumptions are made concerning the development of the other two factors. According to international experience, we can draw conclusions from the term structure of shorter rates concerning the development of future real interest rates and the real growth, while medium and long-term rates contain information about inflation expectations and, consequently, future inflation.

There is no single preferred method for the calculation of the yield curve. The necessary calculations can be performed in several ways; the purpose of application should determine the procedure chosen. Most of the time, there is a trade-off between the accuracy, stability and reliability of individual methods (one criterion can be enforced only to the debit of another) and significant differences can be observed with respect to the technical apparatus required as well as complexity.

The yield curves used in economic analyses can generally be grouped into two types. The first type is the *internal rate of return (IRR)* yield curve, which compares yields calculated until maturity. This type can be calculated the most easily (all that is needed is the internal rates of return of individual bonds).<sup>7</sup>

Nevertheless, this is the type that is the least suitable for purposes of analysis because of its numerous theoretical and practical disadvantages. The most significant disadvantages include that it is not continu-

Figure The Policy Rate of the NBH and Its Future Course Derived from the Yield Curve



ous, furthermore, that the internal rate of return – owing to its definition and method of calculation – does not enable the calculation of forward yields, or the monitoring of expectations.

The other group of yield curves consists of the **zero-coupon** type curves.<sup>8</sup> They are characteristically continuous (can be interpreted for any maturity) and what is a truly useful feature of these types is that they are suitable for extracting information about market expectations concerning the development of future interest rates and inflation. They can be used more extensively because in contrast to the type referred to above, these methods are based on much more sophisticated estimating procedures (which are also more

<sup>6</sup> Most frequently, “term premium” and “liquidity premium” are distinguished. The term premium means that the investment risk is higher in the case of longer-term investments (the price volatility of bonds is more significant than that of shorter-term papers). The liquidity premium compensates the investor against fixing an amount for a longer term (in general, economic agents characteristically prefer to borrow for a term longer than others wish to fix their deposits for, thus generally, a relative shortage evolves in funds fixed for longer periods).

<sup>7</sup> The internal rate of return of a bond means the yield at which its **present value** (thus also market price) is equal to its face value.

<sup>8</sup> The description originates from the estimation procedure, which simulates bonds not having coupons (of the type of the **discount treasury bill**) out of interest bearing bonds and makes calculations on these.

complicated and require greater attention). Typically, central banks prefer stable estimates that lend themselves to economic interpretation, therefore, characteristically they use the zero-coupon yield curves.<sup>9</sup>

The National Bank of Hungary applies the Svensson method – first published by Lars Svensson – which is considered as one of the most widespread procedures among central banks. The zero-coupon yield curve estimated according to the *Svensson method* is suitable for the analysis of expectations of interest rates and inflation, monitoring the changes therein, i.e. all the factors which a central bank needs in order to be able to evaluate the economy in general terms and to consider the effectiveness and credibility of monetary policy (see Figure 10).

In Hungary, the rate of the two-week deposit facility can be regarded as the policy rate of the central bank.

The NBH exerts significant influence on short-term yields through its deposit rate. The rates on 3–6-month government papers, which have an outstanding role to play in pricing credits and deposits, generally

fluctuate around the **policy rate** as the benchmark interest rate. With this, shaping short-term interest rates provides the central bank with an instrument through which it can influence consumption and investment decisions as well as inflation and the external equilibrium of the economy. In contrast, yields on maturities of over a year are determined not by monetary policy but by the expectations of market participants concerning the future conduct of monetary policy and interest rates. This provides an opportunity for the central bank to obtain important information from the yield curve concerning the expected inflation and nominal interest rates.

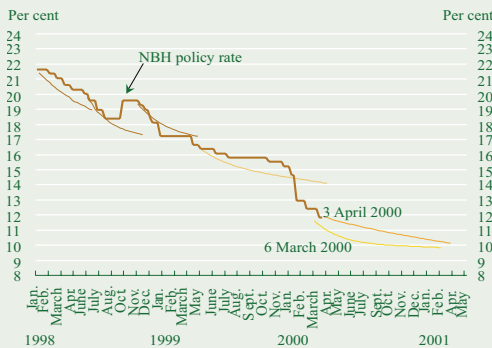
In Hungary’s case, of the three factors (inflation, real interest rates and liquidity premium) the volatility of expected inflation was much greater than that of the other two factors in the 1990s. Hence the assumption that could be regarded as the most well-founded one was that the expected real interest rate and the liquidity premium were relatively stable. Under these assumptions, information could be obtained concerning the development of expected inflation by analysing money and capital market yields and comparing short-term and long-term rates.

Conclusions concerning the relationship between expectations of inflation in the future and current inflation could be drawn without any particular calculation, simply from the slope of the yield curve (see the expectations hypothesis under the presentation of yield curve theories).

A yield curve with a positive slope does not necessarily mean expectations of rising inflation but a curve of a negative slope can, with a high degree of probability, be interpreted as a signal of belief in declining inflation.

By the beginning of 1999 inflation in Hungary had dropped to a single-digit rate and, in parallel, the fluctuation of expectations of inflation subsided considerably (a few years earlier, at the time of the then characteristic 20–30 per cent inflation, uncertainty concerning the inflation of the

**Figure 10** Historical Development of Forward Zero-Coupon Yields in Hungary



<sup>9</sup>For greater detail on estimating procedures, see Attila Csajbók: Zero-coupon Yield Curve Estimation from a Central Bank Perspective, NBH Working Papers, 1998/2

coming period was measured in percentage points; at present, this has declined substantially and can now be measured only in tenths of percentages). Thanks to the more favourable inflationary environment and the development of the domestic capital mar-

ket, increasingly more reliable information can be extracted from the changes in the yield curve with respect to the expectations of market agents concerning the evolution of real interest rates, inflation and economic growth.

## The Channels of Monetary Transmission

One of the key issues in the operation of the **instruments** of monetary policy is monetary transmission. The term **monetary transmission** indicates the mechanism whereby the quantitative and interest rate decisions brought by monetary policy influence macro demand and **inflation** in the economy through various transmissions.

In the **short term** economic policy influences economic growth and inflation fundamentally through the development of macro demand. In general it can be said that due to an increasingly **more restrictive** monetary policy, higher interest rates decrease the consumption and investment demand of the private economy which, regarding the supply side of the economy as granted, mitigates both economic growth and inflation.

Over the *long term*, however, the nominal value of products and services (the price level) and their changes (inflation) are purely monetary phenomena and monetary policy has the important role in their formulation. In contrast, economic growth is determined by the supply side of the economy; of necessity, the central bank can exert only indirect influence on it. A central bank may positively influence the long-term growth course of an economy by reducing inflation and thereby the loss of efficiency caused by inflation.

Monetary transmission exerts its effect through five channels:

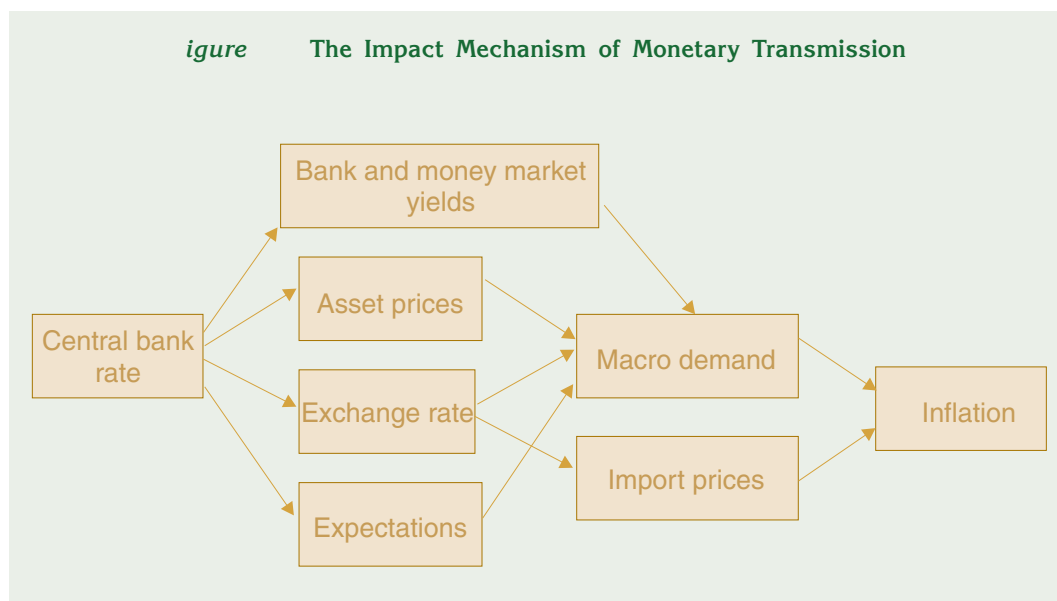
- With increased government paper market and deposit rates, the yield on postponed consumption (savings) increases. This prompts households to reduce present consumption whereby they are able to increase the present value of their total **current and future consumption** (*intertemporal optimisation of consumption*).
- A rise in credit rates reduces largely housing construction and the purchase of consumer durables financed by consumer credits in the case of households, while in the case of companies, as a result of short-term working-capital loans becoming more expensive, it directly puts the brakes on expansion in the business sector (*income effect*).
- With the increase in interest rates, the present value (price) of the financial assets of households decreases, which can be replenished only with a consumption course lower than planned (*wealth effect*).
- The rise in the rates on investment credits prompts companies to mitigate their fixed asset accumulation primarily because of the decrease in the **net present value** of planned projects (*discount factor effect*).

- Finally, increased domestic rates also have an impact on the exchange rate. The appreciation of the local currency alters the relative prices of domestic and foreign products and services which, on the one hand, reduces demand for the former and, on the other, directly reduces the prices of **tradable** products (*real exchange rate effect*).

To this point, we have not distinguished real and nominal rates. In relation to the income effect, however, a subcase could be distinguished when a higher nominal rate restrains the borrower even under a given real interest rate owing to his **liquidity constraint**. For instance, when inflation is at 15–20 per cent, a housing construction credit means a great burden for an individual even if the **real interest rate** is low. The price of the house will rise in proportion to inflation in vain because he has little opportunity to realise that gain from time to time,<sup>10</sup> while he has to continuously finance the nominal interest, kept high because of

inflation, out of his current income. Therefore, this does not mean classical insolvency – it merely means that his nominal interest expenditures clash into the cash-flow constraint.

In addition to the direct effects referred to, *expectations and the credibility of economic policy* have a paramount and ever-increasing role to play in the assertion of the **transmission mechanism**. The theoretically expected effects (as detailed above) of an interest rate measure by the central bank may be significantly modified, in an unfavourable case, decreased or even reversed by the changes taking place in the expectations concerning future interest rate decisions or the development of economic processes. In the event of vigorous expectations of devaluation, for instance, an interest rate increase introduced to protect a fixed exchange rate may increase the costs of maintaining the exchange rate to the extent that will only reinforce market agents in their expectations of pending imminent devaluation and consequently rising inflation. (See *Figure 11*)



<sup>10</sup> In principle, he could do so not only by renting a room or two in the house from time to time, but also by taking out new credits from time to time to debit his real

property, whose value is nominally increasing. In practice, however, banks shy away from this type of lending practice.

Taking explicit account of the inflation expectation of economic agents is particularly important in an economy where double-digit inflation has a fairly long history and the credibility of economic policy is not yet fully established.

What counts in *making decisions about savings and lending is the real interest rate expected by economic agents*. When the credibility of economic policy is low, the inflation incorporated in the expectations of market participants may be substantially higher than that announced in the monetary programme.

The real interest rate content of the nominal rate, assumed by market agents, consistent with the inflation target of the central bank will, of necessity, be lower than what would match the saving and borrowing behaviour intended by economic policy. Higher macro demand, arising as a consequence, presents economic policy decision-makers with a choice of alternatives. In case of an unchanged interest rate policy, inflation expected by market agents, higher than the inflation target of the monetary authority, evolves as a self-fulfilling prophecy. With nominal – and ultimate real – rates higher than otherwise necessary, the growth-restraining impact of the planned inflation reduction will be stronger.

Therefore, the resolve of economic policy and consistency in its objectives are required for substantially reducing the effects of the disinflationary policy expressed in a short-term slowdown in economic growth in an economy with a long history of inflation, so that adjustment to the lower inflation course should take place more rapidly and less painfully through expectations.

Communication by the central bank has a major role to play in shaping expectations.

The central bank must establish its anti-inflationary credibility in which the outward communication of the bank has a pivotal role to play. In its publications and analyses, it declares its goals and commitment, presents macroeconomic money and

capital market processes and the monetary policy instruments, with which it influences processes in the desired direction. In most countries, central banks have publications which present their declared main objectives in reducing inflation, describe the relevant instruments and publish their analyses and forecasts regularly, all of which is done in the light of the ultimate goal.

Such a publication of the NBH is its “*Monetary Policy Guidelines*”, which describes the economic environment in which monetary policy must operate and provides information about the objectives and instruments of monetary policy. The Guidelines are published once a year. The “*Quarterly Report on Inflation*” is a quarterly publication of the NBH providing an overview of changes in inflation to date and as expected, and on how the NBH evaluates the macroeconomic processes which determine inflation.

When assessing the effectiveness of monetary transmission, the issue of the *transmission lag* cannot be avoided. Money market and government paper market yields tend to follow the interest measures of the central bank immediately or with a slight time lag; adjustment in the case of corporate and retail lending and deposit rates may, however, take several months.

A change in interest rate policy exerts its full impact on growth and inflation only in 1.5–2 years according to the empirical studies of a number of countries. This is precisely why monetary policy must, as far as possible, be forward-looking in the course of its operation.

The appropriate steps will have to be taken at the time when an unfavourable inflationary process has not even genuinely unfolded, and only the signs foreshadowing it can be perceived.

The leading *indicators* discussed in the previous chapter provide a great deal of help in this; their changes tend to manifest themselves before the inflationary process and the change in macro demand conditions defining it appear. There is a wealth of

**indicators** of this kind, their choice and specific application greatly depend on the given economic environment.

In addition to the monetary aggregates (some kind of money or credit aggregate), detailed in the previous chapter, and information derived from financial products (changes in the **yield curve**, the **forward curve**, etc.), data forecasting changes in an element of macro demand (for instance, orders from the viewpoint of industrial output or the number of building permits from the viewpoint of household investments) may also serve as indicators.

*Coincident indicators* have a peculiar role to play: they do not precede the process intended to be forecast but move along with them and the relevant data are available earlier (VAT receipts or statistics on car sales in respect of changes in household consumption).

In spite of this, those in charge of formulating monetary policy are frequently forced to take interest rate or money supply decisions when the actual processes can be forecast only with a substantial margin of error. It is therefore no surprise that, as a general characteristic, interest rate measures taken by the central bank are frequently followed by additional ones, that is, a change intended in the monetary conditions is effected not at once but in a series of subsequent small steps.

## Interest Rate Transmission

### The Effectiveness of Transmission

In a country with an advanced system of financial intermediation, monetary policy is able to influence (bank deposit, credit and government paper) yields only indirectly. As we have seen, central banks regard the shaping of 3–6-month **interbank** or government paper yields as their direct tar-

get. The yields evolving in the money market then ripple on to create changes in the deposit and lending rates of commercial banks with more or less of a time lag. This priority area of **monetary transmission** is referred to as the mechanism of *interest rate transmission*.

There are several factors which influence the effectiveness of interest rate transmission, i.e. the simultaneous and proportionate movement of money market yields, influenced directly by the central bank, and the banks' deposit and lending rates:

- the degree of competition in the system of financial intermediation,
- the re-pricing period (duration) of bank products, and
- the volatility of the lending risk **premium**.

A segmented system of financial intermediation with a high degree of monopoly is unable to *effectively* mediate the impulses of the central bank towards ultimate savers and borrowers.

Without the driving force of competition, the monopolist can easily “swallow” the interest rate reduction by the central bank, increasing his profits. In developed countries, however, not only the banks compete against one another, the possibility of direct financial investments and fundraising, which bypasses the banking system, also forces them to pursue an intensively compliant behaviour when pricing their products.

The time central bank measures take to ripple on (the lags in transmission) is fundamentally influenced by the average maturity and structure of the banks' assets and liabilities.

The shorter the **duration** of assets and liabilities, the higher the share of variable interest bearing instruments and the greater the frequency of interest review dates, the shorter *the lags* may be expected to be in general.

The final price of a credit is determined as the sum of the bank's liability costs (including the cost of intermediation and profit) and the *lending risk premium*. The latter depends on the risk of the debtor, his capability to repay the credit. When the premium changes frequently and with great volatility for a major part of debtors, the lending rate intended to be influenced will move together with the liability costs that can be influenced by the central bank only partially, resulting in a low effectiveness of interest rate transmission.

The effectiveness of transmission also deteriorates when dynamic banks intent upon market acquisition can be found in a banking system with a large weight, as they aim at implementing their longer-term strategic objectives instead of maximising their current profits when pricing their deposits and credits.

### The Effectiveness of Interest Rate Transmission in Hungary

The risk premium on lending rates relative to the yield on government papers has fluctuated substantially over the past few years.

The difference in yields on corporate credits maturing in less than a year and three-month discount treasury bills rose above 5 per cent from the earlier negative figure in 1995, then declined gradually until early 1998 to 1 per cent. As corporate lending rates followed government paper yields only in part at the time of the 1998 Russian crisis, the spread declined again in October, then jumped back to the figure characterising the preceding period in a short while. (See Figure 12)

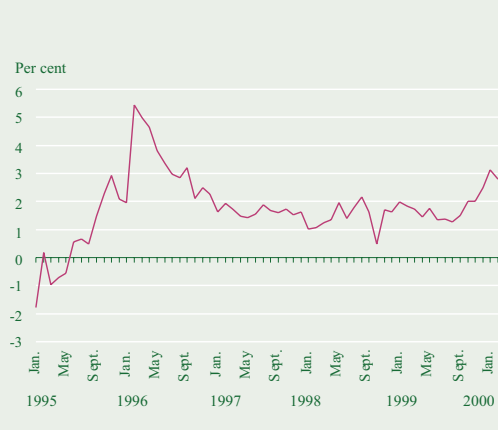
It is a natural consequence of Hungary's high and volatile inflation that the *share of facilities maturing within a year bearing variable interest is high on both the credit and the deposit side*. Owing to this, the duration of the banks' assets and liabili-

ties is short, which naturally reduces the lag in the transmission mechanism.

In the context of the effectiveness of the transmission mechanism, it is necessary to mention a specific feature in the **liquidity position** of the Hungarian banking sector noted since the autumn of 1995 in comparison with the advanced economies. Since the autumn of 1995, as a result of substantial interventions by the central bank, *the Hungarian banking sector has had surplus liquidity which is withdrawn by the central bank from the banking sector through its passive-side instruments re erse repo, deposit, bond*. (See the section on the instruments of sterilisation.)

Consequently, *commercial banks* are in a net lender position vis-à-vis the central bank in contrast to the net borrower position, which can be regarded as general internationally. In principle, this need not give rise to any difference in the effectiveness of transmission, as banks interested in increasing their profits should react the same way to interest rate measures taken by the central bank affecting their costs of financing through shaping the price of liquidity still necessary, as in the event of

Figure The Spread between Corporate Lending Rates on Loans Maturing in Less than a Year and the 3-Month Discount Treasury Bill





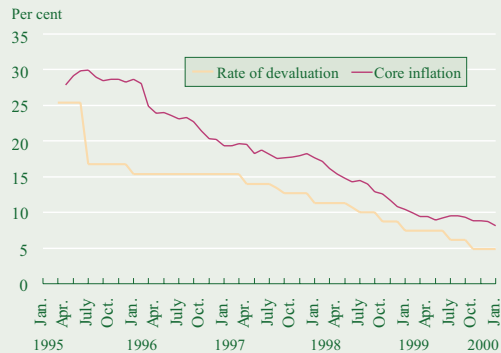
offering alternative investment opportunities to them through the yield on the placement of their surplus liquidity. Nevertheless, experience shows that banks tend to react to changes in the effective cost of financing more sensitively in the course of their everyday operations than to changes in their profits lagging behind their potential.

## The Interest Rate Policy of the NBH

In developing its interest rate policy, the National Bank of Hungary pursues a dual interest rate objective. Under the crawling peg exchange rate regime, it aims at shaping money market yields through its **policy rates**, which, together with the premium expected by investors, guarantee a yield advantage for the forint against the dollar and the euro. On the other hand, however, by influencing money market yields the NBH intends to guarantee a real interest rate level for banking rates that favours household savings and does not lead to a credit expansion, which could endanger the inflation target and the external equilibrium.

The exchange rate target is the *exchange rate course* of the central rate of the forint relative to the currency basket implied by the rate of devaluation announced in advance. Together with the government, the NBH adjusts the announced monthly rate of devaluation to changes in expected inflation. This allowed for a tenth of a percentage decrease annually on two-three occasions on average in recent years. With the increase in the *credibility* of the exchange rate regime over the past few years, the pricing behaviour of market agents was aligned increasingly to the pace of devaluation: changes in the nominal exchange rate index, which characterise competitiveness, arising from the shifts of the exchange rate within the band, and changes in the dollar-deutschmark cross rates did not appear in the development of *inflation*.

**Figure The Trend of Core Inflation and the Rate of Devaluation**



The methodological description of **core inflation** as calculated by the NBH can be found in the September and December 1999 issues of its publication "Quarterly Report on Inflation".

Comparing the exchange rate course announced in advance with the appropriately weighted foreign interest rates of the **currency basket** of the forint and the expected interest premium (for its factors, see the next paragraph) in accordance with the logic of interest rate parity, the exchange rate course determines the desired extent of short-term (3 or 6-month) forint rates. When monetary policy, focusing on domestic processes, deviates from this, then:

- the forint shifts within the band, and/or
- either the central bank **intervenes** at the edge of the exchange rate band or the extent of intervention employed until then changes.

The *expected interest premium* is shaped by the *exchange rate risk premium* given by the risk of an extraordinary devaluation or shifts within the exchange rate band or the *premium* on the risk of solvency of a given country interpreted by foreign investors in terms of foreign exchange. Following the introduction of the exchange rate regime, the magnitude of the risks and conse-

quently the extent of the premium charged by investors decreased radically. The central bank increased the elbowroom of its interest rate policy by loosening the “announced in advance” character of the exchange rate regime from early 1996: from then on, neither the period for the announced extent of the rate of devaluation, nor the date of the next modification have been declared. This increased the exchange rate risk in a characteristically asymmetric manner, as an increase in the rate of devaluation was outside the intentions of the monetary authority, but it could “surprise” market agents by reducing the pace at any time. (See Figure 14)

The 1998 international exchange rate crisis in general and the August Russian exchange rate crisis in particular constituted a relatively novel situation as it reduced globally the willingness of investors to assume risk, which led to an increase in the extent and volatility of the expected premium also in Hungary’s case.

The exchange rate of the forint is allowed to fluctuate in a band of 2.25 per cent around the centre rate; in the past, the NBH had no intention to influence the exchange rate of the forint by intervening within the band. The advantage of the volatility thus arising is that the fluctuating premium expected by foreign investors against

the forint – particularly at times of international turmoil – does not require the immediate adjustment of interest rates; the expected and the factual premium arrive at an equilibrium through *shifts within the exchange rate band*.

Should the exchange rate of the forint reach the edge of the fluctuation bands, the central bank *inter enes* at the strong (weak) edge of the band by purchasing (selling) foreign exchange in order to stabilise the exchange rate.

Until the summer of 1998, substantial strong-edge *inter entions* took place in certain periods, in the course of which the forint liquidity flowing out was tied down by the central bank using its sterilisation instruments (*reverse repo*, deposits, NBH bonds).

This practice of *sterilised inter ention* enabled the maintenance of forint rates higher than those called for by foreign processes, thereby facilitating a reduction in inflation.

Relative to the exchange rate regime in place before March 1995 (fixed exchange rate with unexpected devaluations at variable rates), the nature of the crawling peg exchange rate regime in Hungary and the reduction of the monthly rate of devaluation by small steps provides opportunities for forint and foreign exchange market speculation that are smaller by orders of magnitude. Over the past few years, when the forint stuck to the strong edge of the band in the long term, one could still observe a more sophisticated version of speculation linked to expectations concerning interest rates and devaluation.

Two different circles aimed at speculation in two different ways. Approaching the expected date of interest rate reduction, the banks placed increasingly large amounts into the fixed central bank deposit facility, which at the time matured in four weeks, financed partly by acquiring funds from abroad, trusting in the stable position of the forint within the band. Hungarian regulations, however, strongly limit the open foreign exchange position which the banks may undertake, so they hedged against their open foreign exchange positions according to their balance sheets in the OTC market or in the forward foreign exchange markets of the Bu-

Figure 14 Changes in the Interest Premium on the 3-month Discount Treasury Bill



dapest Commodity Exchange or the Budapest Stock Exchange. The other circle or market agents undertook to sell foreign exchange forward to the banks.

As the period of validity of the current rate of devaluation is not declared according to Hungarian practice, when quoting dollar and deutschmark rates for the various maturities in the forward foreign exchange market, the forint yields of similar maturities proved to be governing. Because of this, when the central bank reduced its rates and consequently government paper yields declined – similarly to the announcement of reducing the rate of devaluation – the forward rate of the forint strengthened relative to the currencies in the currency basket. Making use of this interrelation, those trading in the forward market could make significant profits by forward selling dollar and deutschmark in proportion to the currency basket – exploiting the **leverage** increasing effect of the forward market – even at times of expectations of minor reductions in the interest rate or the rate of devaluation.

When the interest rate reduction hit the mark, the banks naturally won in the **spot** market (conversion of foreign exchange and placement of the proceeds at the still higher forint rate), while they lost against the speculators in the forward market owing to the strengthening of the forint. We could say that the banks were willing to cede a part of their profits to the market agents trusting in the strengthening of the forint in the forward foreign exchange market in order to expand the amount of funds available for the deposit facility prior to the reduction of the interest rate. Naturally, the process could be initiated both by the banks (conversion, deposit placement, forward purchase of foreign exchange) and the speculators in the forward market (forward sale of foreign exchange,<sup>11</sup> **conversion**, deposit placement), though the end result was always the same. When an interest rate reduction was expected, the **open foreign exchange position** of the banks according to their balance sheets increased and the sale of foreign exchange against the central bank strengthened and the short-term

sterilisation stock increased suddenly. When the central bank warded off the surplus sterilisation burden caused by higher conversion by reducing its policy rates (as happened on several occasions), the expected decline in yields was realised and the market induced expectation became a self-fulfilling prophecy.

## Transmission Along the Yield Curve

It is general practice among today's central banks that a central bank will intervene only at the very short end of the **yield curve** going up to a maximum of a month, quoting interest rates. This has a two-fold reason: first, this is where the central bank is strongest against other market agents (because the shorter period means a lower profit by speculation for market agents when they "hit" the central bank's interest rate measures; in this way, there is no need to calculate with unmanageable outflows of credit or placement of deposits due to speculation); second, this enables the part of the yield curve longer than a year to purely reflect the **expectations of market agents concerning inflation**, which is a source of information of paramount importance for any central bank. (See *Figure 1* )

*Figure 1* The Period of the Policy Rate Applied by Individual Central Banks

	Period (day)
EMU	14
Germany	14
France	7
Italy	30
United Kingdom	1–33
USA	1
Japan	1
Canada	1

Prior to 1 January 1999.

<sup>11</sup> As banks quote prices in this forward market, in the case of major sales investors ultimately conclude transactions on a massive scale with them. On the other hand, the banks sell foreign exchange in the spot market in proportion to the increase in their forward position to hedge their open foreign exchange positions.

Partly for similar considerations, in March 1999 the NBH shortened the period of its policy instrument in the course of the last few years to two weeks, similarly to that of the European Central Bank. With the rate quoted for this period, the central bank is able to effectively influence the *3–6-month interbank and secondary government paper market yields*, of outstanding importance in Hungary from the viewpoint of **interest rate transmission** under balanced market conditions.

The 3–6-month period (benchmark or BUBOR) has an outstanding role in pricing bank credits with respect to both working capital finance maturing in less than a year and development credits maturing over a year, as the vast majority of these credits bear variable interest. A pricing practice of within a year also characterises household deposits even though more than half the stock is fixed for a period of more than half a year (between 6 and 12 months). Here, policy rates have a less significant role to play

than in the case of credits, as a great many Hungarian banks also follow strategic objectives (market acquisition, enforcing of monopoly prices) in the field of collecting household funds.

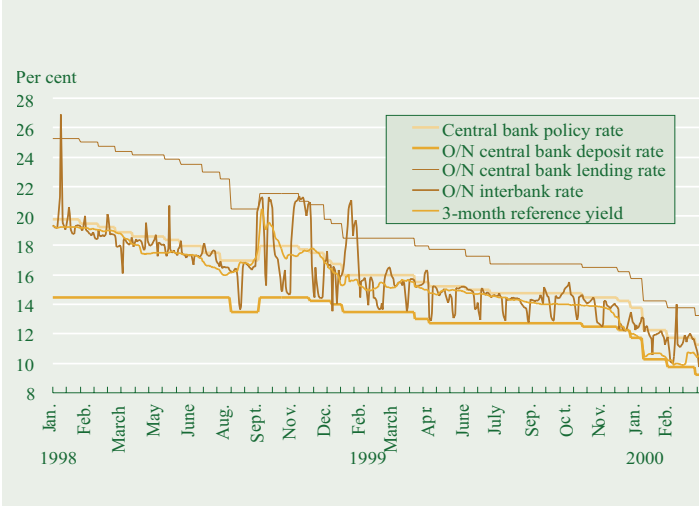
Owing to the substantial part played by **discount treasury bills** in household savings, it may, however, be assumed that changes in the yields of government papers maturing in less than a year govern household deposit collection as well, even though it is relatively less exposed to competition.

The shortest-term, and therefore most sensitive, rate in the money market is the *overnight ( rate evolving in the interbank market.*

Central banks, whose policy rate is the overnight rate, obviously intend to tolerate only the least possible volatility in the O/N interbank market. (See Figure 16)

For central banks whose governing arrangement is for a longer term (two weeks), like the NBH, the O/N interbank yield is important from the viewpoint of the transmission mechanism to the extent that it is able to shift the longer-term market yields on arrangements maturing in less than a year in some direction. Because of this, the NBH maintains an **interest rate corridor symmetric to the two-week governing yield** on the O/N maturity through its repo and deposit arrangements. This is called to ensure that the O/N interbank rates remain within the relatively narrow band determined around the two-week deposit rate, apart from cases of extreme liquidity shortage.<sup>12</sup> In principle, however, the O/N yields may give rise to un-

**Figure** The Policy Rate of the Central Bank, the O/N Interbank Rate, and the 3-month Government Paper Market Benchmark Yield within the Interest Rate Corridor of the Central Bank



<sup>12</sup> As against the deposit arrangement, there is a credit line broken down for banks, attached to the repo facility, hence it is possible that in case of a substantial liquidity shortage, the interbank rate may shoot out from the corridor upwards.

desirable effects spilling over to the longer terms, when, during the reserve period, they stick to one half of the band in a sustained manner and, because of this, the rollover yield on O/N credits or deposits differs from the effective central bank rate. To manage such exceptional situations, the NBH has a short, but variable term, quick tender that is capable of managing liquidity situations, which differ vastly from that expected by the banks within the reserve period (for greater detail see the chapter on the set of instruments).

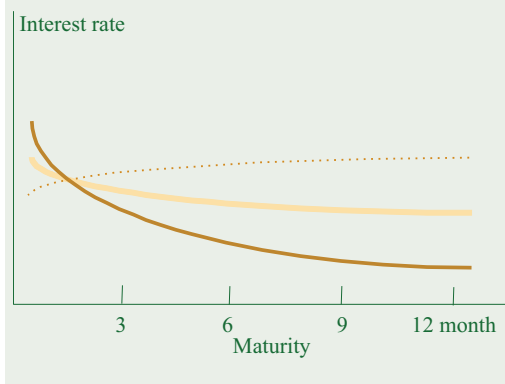
Ultimately, the central bank is able to exert an impact on longer-term yields through the short rates using the *forward interest parity*.

Accordingly, the three-month yield level settles at a level so that the yield on 3-month investments should correspond to the expected yield of rolling a two-week investment through three months. When for instance the market expects stable two-weekly central bank rates, the 3-month nominal yield must exceed that of the two-week, as the rollover investment means that a compound interest is mopped up. When the market expects a general trend of interest rate reduction, the yield curve will naturally be inverted because, in the course of rolling the two-week investment, reinvestment will be possible only at increasingly lower rates.

When the market expects an interest rate reduction with a high degree of probability, the **yield curve** will *pivot* around the **policy rate** of the central bank.

The explanation of this phenomenon is that market agents would like to make the largest possible profit from the re-pricing expected because of the interest rate reduction. When the yield curve is expected to shift downwards in a parallel fashion as a result of an interest rate reduction, the price of financial assets with a high **duration** will increase substantially. Knowing this, market agents attempt to purchase securities with the longest possible term, bearing fixed interest, at times of expectation of interest rate reduction,

**Figure** Pivoting of the Yield Curve in Case of Expectations of Changes in the Interest Rate by the Central Bank



which drives (pushes) the price (yield) of these papers upwards (downwards) even before the interest rate reduction. The efficiency of this speculation strategy can be improved when the investor uses short-term – for instance, interbank – loans to purchase longer-term papers in the knowledge that, after the interest rate reduction, the yield level will also decline on the shorter maturities, so later he will be able to finance the longer-term investment with cheaper, short-term funds.

When an interest rate reduction is expected, the growing demand for short-term funds triggers an increase in very short-term yields.

All in all, therefore, the yield curve pivots as a result of the expectations of interest rate reduction and the shift in the yield curve on longer maturities precedes the expected change in interest rates. Because of this, when the central bank does not alter interest rates, the expectations of interest rate reduction will grow stronger again and again, and the volatility of longer-term yields increases even when the central bank rate is stable. (See Figure 17)

The fluctuation in interest rates caused by pivoting is not necessarily bad because it contains information for the central bank

with respect to expectations concerning the interest rate level. If in such a case the central bank intends to blunt the shift in **overnight** yields with the “traditional” instruments – narrow interest rate corridor or

pumping additional liquidity into the system – it will only increase the speculation opportunities for money market agents, who will be able to obtain short-term funds more cheaply.

## III. THE INSTRUMENTS OF MONETARY POLICY





# A HISTORICAL OVERVIEW OF THE DEVELOPMENT OF THE INSTRUMENTS<sup>1</sup>

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During the history of the one-tier banking system, the main instrument of monetary policy was the system of *credit quotas*: in the course of economy planning, credit lines were specified to finance state investment programmes, private housing construction and other preferred investments, such as export development, import substitution, etc. The preferred objectives were supported by interest rate subsidy or subsequent interest reimbursement by the budget. Credit quotas were also applied in working-capital loans, which, however, fell within the competence of the NBH in contrast to the plan reconciliation procedure of long-term lending.

From 1 January 1987, the organisational separation of the banking system was in place but actual competition among commercial banks evolved only gradually.

## The Use of Direct Monetary Instruments

The instruments of monetary policy can be classified in several ways (described in greater detail in the next chapter), but in Hungary's case from the viewpoint of the development of the instruments it is relevant to draw a distinction between *direct and indirect instruments*. During the initial period the use of direct instruments was typical, the essence of which was that the central bank, as the monetary authority, was entitled to issue binding rules for the commercial banks and thereby it directly delineated

the magnitudes of the variables it intended to regulate. The most frequently used direct instruments were direct interest rate regulation, setting interest rate ceilings (or eventually interest rate floors, interest margins) and lending ceilings (credit quotas).

The *indirect instruments* attempt to exert an effect on the money supply through influencing the supply components of the monetary base and the multiplier, i.e. their use is based on the central bank's ability to influence money market conditions. Indirect instruments include the various types of **open-market operations**, credit auctions and deposit tenders. The use of direct instruments was inevitable in the conduct of monetary policy when it was not possible to deploy indirect instruments in the financial system due to the underdeveloped nature of the markets. Nevertheless, countries with an developed financial system also apply them frequently, for instance in the event of a vigorous credit expansion. Yet, they have lost significance everywhere for several reasons: for instance, direct limits deprive banks of the incentive to collect deposits once the credit ceiling was reached; they reduce competition among the banks; the banks develop innovations tailored to local conditions and constraints, with which they are able to get around regulations; and they act as incentives for the establishment of a system of financial intermediation outside the banks.

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<sup>1</sup> An accurate description of the monetary policy instruments mentioned in this chapter can be found in the next chapter, which addresses the concepts of the instruments and its current operation.

Together with the appearance of foreign institutions in an economy with increasing openness, new techniques and innovations evolved; as a result of deregulation in the financial system, new institutions being not subject to direct regulation could be established; and the banking sector subject to direct control also became capable to innovate, evading the restraining instruments, or, if viewed from a different angle, they were forced to act this way as otherwise they would have been driven out of the market. Until the early 1990s, the central bank was strongly restricted in developing its monetary policy instruments, partly because of the absence of a money market and partly because of the limited nature of competition among the banks.

A decisive constraint was that commercial banks were not permitted to engage in retail banking in the first two years of their operation, they were licensed to collect deposits only from the corporate sector and to lend only to them. Until the spring of 1989, commercial banks had no license to administer foreign exchange operations or to collect foreign exchange funds. Hungary had a *substantial net foreign debt* and this stock appeared in the balance sheet of the NBH at the time when the banking sector was transformed into a two-tier one. With the separation of the commercial banks, the NBH stock of claims against companies was taken over by the banks, but the net foreign debt, which represented the source of financing for a considerable part of corporate loans, remained in the balance sheet of the NBH.

Under such conditions of strongly *restrained competition* and a macroeconomic situation characterised by significant **current account deficit**, sustained double-digit **inflation** and frequent and major devaluations, commercial banks had to rely on the central bank to provide them with funding and this *channel of refinancing was the fundamental instrument of central bank regulation until 1991*.

From the demand side, demand for central bank refinancing was virtually un-

limited, as the “soft budget constraint” in corporate financial management was still upheld (the bankruptcy and liquidation rules already in force were not yet effectively enforced). In contrast, the **prudential rules**, regulations concerning debtor rating and provisioning, which would have minimised the losses of the banks, were not yet in place. Owing to the unlimited demand for credit and the flow of all the free funds to lending, the central bank had to **sterilise free liquidity** in order to achieve the macroeconomic objectives. As demand was interest rate insensitive, interest rate policy was not a suitable instrument. As the banking sector was still strongly dependent on central bank funding, the regulation of liquidity by direct instruments was evident through the *reduction of the normative short-term refinancing credit lines of the banks and raising the reserve requirement*.

In the initial years, when the central bank was able to use genuinely indirect instruments only in a very limited way because of the underdeveloped markets, the *instrument of the reserve requirement* or, to be more accurate, **liquidity management** achieved through altering the reserve rate through the impact on **money multiplication** within the functions of the reserve system, gained a role greater than at present. (The instrument of the reserve requirement can be grouped under both direct and indirect instruments as in the course of its application the central bank, in its capacity as monetary authority, provides for the obligation of setting aside reserves while it influences money in circulation indirectly through the money multiplier.)

To offset the acceleration of multiplication and to absorb liquidity, the central bank raised the reserve rate both in 1989 and 1991. The central bank has paid compensation on the reserve stock deposited by commercial banks since September 1990. This was called to partially offset the loss of income owing to the reserve rate regarded as high in an international comparison.

## Money Market Development Use of Indirect Instruments

Changes in macroeconomics, institutions and regulation, launched in the first few years of the operation of the **two-tier banking system**, provided an opportunity and called for the development of monetary policy instruments in the early 1990s.

Although the distinction between corporate and retail banking operations ceased as from 1 January 1989, for some time integration was made more difficult by the fact that special reserve requirement provided protection to the deposit portfolio of OTP, i.e. to the financial sources of households, primarily housing construction credits. This regulation was, however, not extended to certificates of deposit, hence this opened the floor for the evolution of competition for the increment in household savings. Corporate deposit and lending rates were liberalised as early as 1987, retail rates were liberalised only after the integration of bank operations but, until 1991, the central bank used the instrument of an interest rate ceiling on household deposit and lending rates, and certificates of deposit.

*The decentralisation of foreign exchange operations of commercial banks* was a process that took several years, beginning in 1989 with the step of permitting the banks to collect foreign exchange deposits, which entitled the banks to use foreign exchange credits in a limited range, and swap operations. In the first half of 1990, banks properly prepared to perform foreign exchange operations were licensed to administer trade-related foreign exchange transactions administered in convertible currencies. In 1991–92 restrictions on foreign exchange operations were further softened and, in fact, both the placement and collection of foreign exchange funds became unrestricted. Until then, foreign exchange over and above that intended for permitted placement and limited use had to be sold to the NBH. From then on, however, banks were permitted to

freely buy and sell foreign exchange from one another. The then limited interbank foreign exchange market began to operate in July 1992, where the exchange rate of the forint developed in response to demand and supply. This meant that monetary policy could use the instrument of conversion. Once this was in place, the central bank limited the risks arising from the banks' foreign exchange positions not directly, but through the banks' *open foreign exchange positions*.<sup>2</sup>

Certain forms of the *money market* appeared as early as the beginning of the 1980s, with the licensing of intercompany lending (the interest rate and other conditions of intercompany lending, however, remained largely hidden to monetary policy) and the institution of the bill of exchange. With the establishment of a two-tier banking system and the liberalisation of domestic interest rates, the floor was opened for the development of money markets. This, however, did not begin because of the liquidity shortage, the lack of confidence and the problems in liquidity management and redemption risks. Consequently no characteristic short-term market rate could evolve. In order to create a properly functioning money market, the National Bank of Hungary, by virtue of its central role, began to organise the auction market of *treasury bills* and a *centralised interbank money market*.

In the centralised interbank market, market agents stood in a contractual relationship not with one another but with the central bank, which meant that the NBH paid whenever a borrower bank was unable to pay on time (at the same time, the central bank could exclude banks in default from this market). This was an off-balance sheet activity for the central bank. It acted as an agent driven exclusively by the desire to build the market.

The National Bank of Hungary operated the *auction market* for *discount treasury bills* from December 1988. As the

<sup>2</sup> The total open position of a credit institution may not exceed 30 per cent of its guarantee funds.

yields evolving in the auctions could not break away from deposit rates (particularly corporate deposit rates), the yields evolving in the auctions had an impact on the general interest rate. The still acceptable yield maximum (i.e. the minimum price that could be accepted at the auction) was determined by the *Ministry of Finance*; the main criterion in making this decision was the development of the general financing requirement. It is important to emphasise this because during this period, when the market was characterised by ample liquidity and the central bank had no other instrument to tie down excess liquidity (1992), the sale of the discount treasury bills in the **primary market** played the role of sterilisation. The impression that the discount treasury bill auctions were part of the central bank's set of instruments was reinforced by the coincidence of the endeavour by monetary policy to generally reduce lending rates and the natural need of the budget to reduce the costs of financing. (This impression was further reinforced by the fact that the discount T-bill auctions were organised and administered by the central bank.) Issue, however, was determined not by monetary criteria but the financing requirement of the budget, which did not necessarily coincide with the requirements of monetary policy. (This became evident in the following year, when the central bank decided to raise interest rates owing to the deteriorating macroeconomic processes, but the budget continued to endeavour to finance the budget deficit as cheaply as possible.)

The large-scale issue of **treasury bills**, which had a history of several years by then, the appearance of commercial bills, and early in the 1990s that of commercial bonds and the substantial quantity of government bonds issued for the purposes of bank consolidation all represented a stock of securities of a volume and quality that provided an adequate base for performing *open-market operations*. In addition, organising the issue of, and trading in,

these securities established the technical and professional background required for using similar money market instruments at both the central bank and the commercial banks. From 1993 the NBH introduced central bank quotations for *repurchase agreements (repo)* and *reverse repurchase agreement (reverse repo)* with respect to government papers. This indirect instrument was aligned to the process of financial liberalisation and deregulation, and it constituted a more sophisticated tool of regulation than the opportunities provided by altering refinancing credit lines.

From 1993 the central bank satisfied the short-term liquidity needs of financial institutions, i.e. short-term refinancing (or tied down excess liquidity) in the form of **repo transactions**. The central bank, however, developed their conditions so that the banks should find it more worthwhile to turn to the interbank market in the event of a **liquidity shortage**.

The *portfolio of medium and long-term refinancing* continued to represent a substantial share in the central bank's assets. The NBH played only an intermediary role in distributing these credits. These were largely foreign credits (i.e. foreign exchange funds), which the commercial banks were unable to raise directly (for a long time, only the National Bank of Hungary had connections with foreign lenders because building up confidence, a name and network of connections takes a long time, particularly for an economy in transition). Hence the NBH channelled these credits to the commercial banks. These mainly medium and, less frequently, long-term credits did not constitute part of the monetary instruments as the central bank undertook only an intermediary role for historical and institutional reasons. The greater part of these credits served project financing or some kind of a selective purpose (export promotion, modernisation, acceleration of the establishment of modern forms of ownership, etc.). (See *Figure 18*)

To expand their forint liquidity, commercial banks could also use the foreign exchange deposits placed with them. When the central bank expands the range of *transactions covered by foreign exchange* – that is, renders its conditions more favourable – it facilitates the expansion of liquidity in the banking sector. This is also an incentive for commercial banks to raise funds abroad. The purpose of the *foreign e change deposit swap* was to transform long-term foreign credits and short-term foreign ex-

change funds to long-term Forint-denominated credits. The essence of the arrangement was that the NBH extended medium-term or long-term forint refinancing credits against foreign exchange deposits kept with the central bank to an amount calculated with the exchange rate quoted on the day of their placement, in a period when long-term funds had not yet been generated domestically. This arrangement also did away with the exchange rate risk, arising upon the onlending of the foreign and do-

Figure	Changes in the Medium and Long-Term Refinancing Portfolio, 1991-98							
	Data as at 31 December							
	Ft billion							
	1991	1992	1993	1994	1995	1996	1997	1998
<b>Investment and other refinancing credits</b>	145.3	138.9	91.2	74.1	58.8	8.9	5.7	2.8
<b>Arrangements assisting companies</b>	17.5	27.1	104.7	134.4	137.9	127.6	110.4	91.1
– Refinancing credits of international financial institutions	0.0	0.0	7.4	6.5	11.9	10.4	7.8	4.1
– World Bank refinancing credits	0.0	0.0	40.4	32.8	29.7	20.9	16.2	12.7
– Development purpose refinancing credits for small businesses	3.0	3.2	1.3	0.9	0.5	0.4	0.4	0.4
– Start up Refinancing credits	10.5	7.0	3.6	1.4	0.9	0.5	0.3	0.1
– START refinancing credits	3.0	7.6	8.7	8.8	7.3	6.4	6.8	8.9
– Refinancing credits linked to reorganisation and privatisation	1.0	9.4	32.2	60.4	60.6	54.8	46.1	36.7
– Japanese refinancing credits	0.0	0.0	11.2	23.7	26.9	34.4	32.9	28.1
<b>Refinancing credits extended in foreign currency</b>	24.3	33.2	24.3	19.1	15.7	11.7	12.6	11.5
<b>Refinancing credits extended against foreign exchange deposits</b>	10.6	7.2	21.1	130.3	79.7	77.5	49.0	50.6
<b>Total</b>	197.7	206.3	241.3	357.8	292.1	225.7	177.7	156.0
NBH balance sheet total	2,553.1	2,688.9	3,468.8	4,024.2	5,420.4	5,119.3	5,338.1	5,930.5
<b>Share of refinancing credits in the balance sheet of the NBH</b>	7.7	7.7	7.0	8.9	5.4	4.4	3.3	2.6

Largely pre-1987 investment and shorter-term credits linked to the initial period of the two-tier banking system.  
Fixed-purpose financing credits extended by foreign governments and banks generally for the purchase of capital goods from the lender countries.

mestic foreign exchange funds in forint terms, which would have been substantial under the given conditions of economic policy and the absence of *instruments suitable for the management of long-term exchange rate risk*. The development of the *interbank foreign exchange market* and the widening of possibilities for placing foreign exchange abroad enabled the central bank to gradually subdue this channel of refinancing (first with respect to shorter maturities, terminating the arrangement in 1993 and then also on medium maturities), closing it altogether in 1995.

Futures and Forward markets provide an opportunity for hedging against exchange rate risk. Their limited nature, particularly with respect to maturity and the shortage of long-term funds, called for a **foreign exchange deposit swap** arrangement in force from 1995 to 1998. This arrangement could then be used exclusively for project financing under strongly delineated conditions. As seen from the preceding paragraph, this arrangement could not be regarded as part of the monetary policy instruments.

Short-term *foreign exchange swap arrangements*<sup>3</sup> did in turn constitute part of the **instruments**. *From 1993 foreign exchange swap transactions had a role identical with that of repo transactions in monetary policy their conditions were adjusted to those of the repo transactions.*

With the Hungarian banking system gaining muscle, the conditions for the banks' direct entry to foreign markets were gradually put in place. The NBH endeavoured to dismantle the above activities – re-channelling of foreign government and bank credits, transformation of foreign exchange deposits into long-term forint credits – which could not be reconciled with its central banking functions and to entrust them to the market, purging them from its balance sheet.

Although the instruments with which the central bank could regulate the demand for money by the banks in a more differenti-

ated manner gradually came into existence, the instrument of the *reserve requirement* continued to be used by the central bank to adjust liquidity in the banking sector owing to the relative underdevelopment of the money markets. The impact of changing the reserve rate is immediate and “vigorous”, hence the central bank made use of the possibility of raising the reserve rate in the initial period of capital inflow.

In the longer term, however, the objective is to significantly reduce the reserve rate, which will decrease the loss of income arising from setting aside the reserve and thereby improve the competitiveness of domestic banks. In 1996, the NBH created a reserve requirement system, where the expansion of the range of liabilities subject to the reserve requirement made avoidance of setting aside the reserve more difficult, and terminated the preference of certain groups of liabilities, which enabled a reduction in the ratio (to 12 per cent) without reducing the effective placement of reserves. The chapter on the set of instruments discusses in greater detail the new reserve requirement system developed in 2000, to be introduced gradually by the summer of 2001.

Over the past ten years, the instruments of monetary policy in Hungary have undergone rapid developments. Starting out from the initial distribution of credit lines, the central bank deliberately aimed at applying market methods. The applicable instruments, however, are greatly dependent on the macroeconomic and institutional conditions. The need to develop the instruments frequently preceded the development of the institutional system and interventions in conformity with market principles experienced significant constraints. The budget, or rather its financing, frequently influenced processes in a decisive manner.

In 1991–92 the neutralisation of the excess liquidity caused by the budget deficit and capital inflows created problems for the central bank as its instruments employed until then were fundamentally designed for liquidity expansion. Based on these experiences, the central bank, giving up quantitative regulation, gradually moved towards interest-rate-driven monetary control.

<sup>3</sup> For more detail on the instrument of the swap see the section on “The Basic Instruments of the Current Central Bank” in the chapter “The Set of Instruments”.

# THE OPERATION OF THE INSTRUMENTS TODAY

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Although the term ‘central bank monetary policy instruments’ can be read and heard frequently, it is not always clear what the users of this expression mean. One of the main reasons for this could be that the instruments of monetary policy are strongly specific to the central bank in question, adjusted to the targets marked in the hierarchy of objectives in the monetary policy of the given bank. Hereafter, there is a description of the instruments, based on the practice of the NBH, using categories based on the operating target to be achieved by the instrument, proceeding from general aspects to actual practice.

In a primary breakdown, we can distinguish the instruments directly linked to the maintenance of the exchange rate regime (**foreign exchange market intervention**) from the forint money market and regulatory instruments in the practice of the NBH.

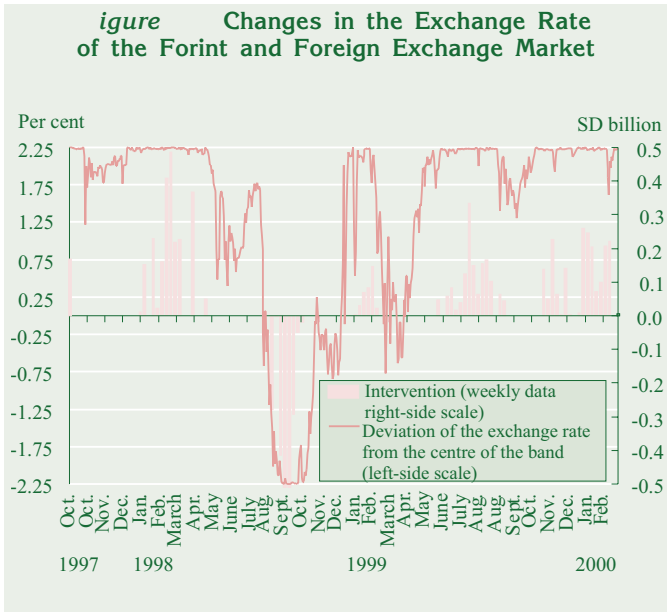
## Foreign Exchange Market Intervention

To maintain the given exchange rate regime, whenever there is a danger that the currency of a country becomes overvalued, the central bank buys foreign exchange in the foreign exchange market, i.e. it intervenes in the course of which it increases the amount of the local currency in circulation. It intervenes in the opposite direction when the local currency may become un-

dervalued in the foreign exchange market. The point of reference relative to which the local currency may become either under or over is determined by the exchange rate regime.

Until the end of 1999, the exchange rate of the forint was pegged to a *currency basket*, which, in 1999, consisted of 70 per cent euro and 30 per cent US dollar. From 2000 the forint has been fully pegged to the euro. Under this regime, since March 1995, the NBH has been executing crawling exchange rate devaluations announced in advance, applying a fluctuation bands of 2.25 per cent. Devaluation is effected daily, based on the crawl, determined for a month in advance but announced months before. This means that the exchange rate, pegged to the currency basket till the end of 1999 and then on the euro, is devalued daily by a specific rate; the market exchange rate of the forint may be 2.25 per cent weaker or stronger than this centre rate, i.e. the market rate of the forint may fluctuate within a band of 4.5 per cent.

At the two edges of the band of devaluation the NBH is at the banks’ disposal. At the strong edge, it automatically offers to purchase foreign currency, while at the weak edge, it offers to sell foreign currency with no ceiling on amounts. In these cases the lowest transaction amount is USD4 million or EUR3.5 million which may be raised by steps of 0.1 million. Consequently, it is also possible for transactions to be concluded in the event of trading in substan-



establishment and use of which is provided for in the Act on the Central Bank.

The *set of business instruments* is narrower than the potential set of central bank instruments, as it refers to all the instruments for which the central bank has developed its business conditions in force or there is a central bank (NBH) regulation in place, regardless of whether or not the central bank uses the given instrument. These are the instruments, which the monetary decision-making body uses, or may use, at any time as their framework conditions are continuously in force.

tially lower amounts outside the exchange rate band to a minimal extent.

The central bank is available to traders at the edges of exchange rate band from 9.00 to 12.00 hours and again from 13.00 to 15.00 hours.<sup>4</sup> Settlement (debiting and crediting the forint and foreign exchange accounts of the commercial banks) is effected on the second workday after the day of the transaction.

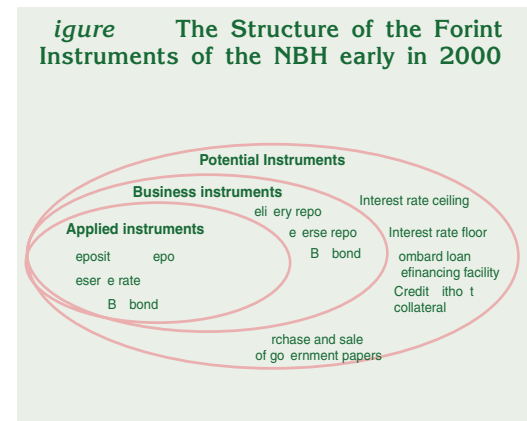
To protect the value of the currency, the NBH also has an opportunity to trade within the band. Examples of this have been exceedingly rare and they occurred only in the form of selling foreign exchange: up to 1999 it happened only as a result of the Russian crisis.

## The Operation of the Forint Instrumentarium

The *potential* (possible maximum) *central bank instruments* represents the set of monetary policy instruments, the es-

When thinking of the instruments, we most frequently mean the business instruments. The *applied instruments* constitute that part of the business instruments which contain elements continuously applied by the central bank. This includes those tenders, which need to be separately and individually announced (which is part of their application); but the arrangement is continuously available, so there is no need to separately announce the arrangement itself.

The elements of the set of instruments can be grouped using a number of criteria:



<sup>4</sup> The table showing the hours of business of the NBH is presented in the Annex.



they can be distinguished by maturity; by their objective or role; by their form of sale or introduction to the market; and by their availability or the eligibility of the counterparties. The instrumentarium is frequently broken down into direct and indirect instruments based on their *impact mechanism*. Direct instruments include the highest lending rate or the lowest/highest deposit rate which commercial banks may apply, the use of credit or deposit quotas appearing at the regulatory level, with the regulation of the **reserve rate** frequently put in this category as well.

The indirect instruments include *open-market operations* with the standing facility lumped together with them, or put into a category of its own under indirect instruments. Classic open-market operations are the outright sale or purchase of securities, tendering (repo, reverse repo or deposit tenders) and the issue of bonds.

Below, the instruments will be presented primarily in a *breakdown by objectives*.

By their functions and objectives, we may distinguish:

- the reserve rate,

and the groups of instruments playing a direct role in the development of interest rate policy, such as

- the instruments used to maintain the **interest rate corridor**,
- the instruments used as **key instruments**,
- the instruments used for sterilisation purposes, and
- the elements used for adjusting liquidity.

## Reserve Requirement System

When employing the **reserve requirement regulation**, financial institutions subject to the regulation must place a specific portion of their liabilities in central bank money on the account kept at the central bank.

## Functions of the Reserve requirement

The original function of the *reserve requirement* can be traced back to prudential factors. Upon its appearance it constituted a reserve against deposit withdrawals. The purpose of its use has, however, changed and the area of its application expanded. The tasks of reserve requirement are multifarious, changing from country to country, depending on which function is preferred by the central bank. Reserve requirement regulation may have the following functions:

- As the reserve requirement *means stable demand for central bank money, it withdraws a certain amount of money from circulation, thereby directly reducing liquidity in the banking sector*. The reserve requirement, when it creates a liquidity shortage in the banking sector, prompts banks to turn to the central bank for funding. The central bank uses the demand for central bank money to effectively influence the rates applied by the banks through its interest rate policy – that is to say, it improves the effectiveness of the *transmission mechanism*. When the banking sector of a country has a sustained liquidity surplus in a given period – for instance, in the event of major capital inflows – the reserve requirement assists in absorbing excess liquidity.
- The reserve requirement can assist in the *banks' liquidity management*. When the reserve requirement must be met at an average of the reserve period, this mechanism provides an opportunity for the banks to hold, for a transitory period of a few days, reserves lower or higher than the reserve requirement level in the given reserve period. Consequently, *the reserve requirement as a buffer reduces the volatility of interbank rates*.

- It may serve as *collateral* in the event of a decrease in liabilities.
- It may be used as an indirect tax in the event of the payment of interest below the market rate or the non-payment of interest.
- It *provides information* on changes in the liabilities of the banks.

### Elements of the Reserve System

The Reserve requirement system has several features, which may differ from country to country. The most important elements of the reserve system are the reserve rate, the reserve bases, the objective form of the placement of the reserve, the entities subject to regulation, the interest paid on the reserve, the form of meeting the requirement or the relationship between the period of calculation and the period of placement.

As to the *form of placing the reserve*, the reserve may be placed in local currency, foreign currency or different currencies by liability in accordance with the regulations prevailing in the given country. The placement may include vault cash or only the amount kept with the central bank may be regarded as eligible for meeting the reserve requirement. A solution whereby the amount corresponding to the amount of the reserve requirement must be transferred to a separate account for placing the reserve is also possible. However, in most countries, the settlement deposit account fulfils this function.

The *rate of reserve* (the reserve rate) is a percentage of the external liabilities held by the entities subject to the reserve requirement as specified by the central bank, which determines the amount of the reserve to be placed by the given institution for a given period. The rate and the base of the reserve – or rather the amount of the reserve determined by them – are important from the viewpoint of the withdrawal of liquidity.

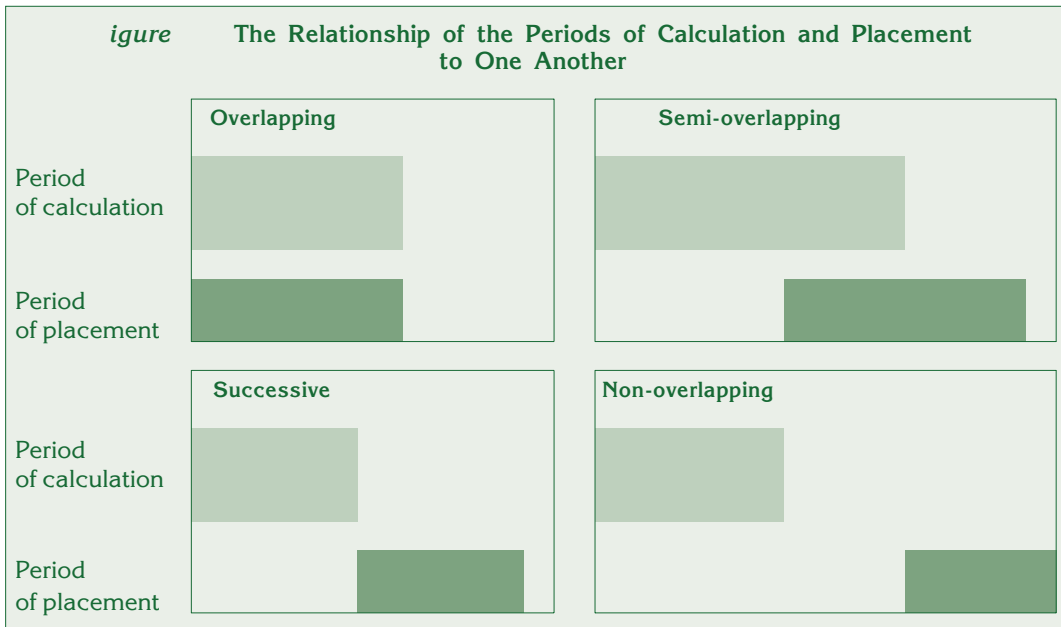
The entities *subject to* the reserve requirement are the members of the financial system, most frequently the banks only, and

other financial institutions operating as a bank.

The *base* of the reserve is generally the amount of external liabilities, which may change according to the national preferences of individual countries (exemption from the reserve requirement for external liabilities originating from abroad or foreign exchange funds).

To measure the base of the reserve, the stock of liabilities subject to the reserve requirement in one or more selected days of a given period may be designated; most frequently, however, every day of a given period is considered and an average of the stock of liabilities subject to the reserve requirement is calculated (this period is the period of calculation). The reserve calculated in this manner must be placed for a given period in central bank money (the period of placement). Most frequently, the *periods of calculation and placement* are equal in length, but they do not necessarily coincide. The periods may be successive, staggered (not overlapping), semi-overlapping or overlapping periods.

The advantage of overlapping periods is that the reserve must be deposited on the current stock of external liabilities. As, however, it is difficult to ensure accurate meeting of the requirement at the end of the period, the semi-overlapping period is applied, which provides an opportunity for accurately meeting the average requirement that cannot be foreseen at the beginning of the period of placement. The successive period is better than the semi-overlapping period in the sense that the periods of calculation and placement are separated. However, frequently, at the beginning of the period, it is unknown on what amount of average liabilities must the required sum be placed. This can be particularly problematic when banks must meet a part or all of the reserve requirement daily. That is why the non-overlapping period is also applied, when the extent of the reserve requirement is known at the beginning of the period of placement. The disadvantage of this method is that—in a comparison of the four



methods—the period of calculation is furthest away in time from the period of placement. (See Figure 21)

### The Flexibility of Reserve Regulation

The reserve requirement ratio regulation fundamentally determines the central bank's instruments. The other elements of the instruments will have to be structured differently depending on whether

- there is no reserve requirement regulation,
- reserve regulation exists, but it is inflexible, or
- it exists and it is flexible.

When *there is no reserve requirement regulation*, the central bank has to facilitate stable demand for central bank money and the smooth operation of the banks' liquidity management with other instruments.

Reserve regulation is said to be *inflexible* when the requirement must be met in full every day. In this case the monetary role of the reserve is to reduce market liquidity permanently. The reserve requirement may create sustained demand for central bank money or, in a period of sterilisation, may

contribute to safely tying down a part of excess liquidity.

When reserve regulation exists and it is also *flexible*, then its task, in addition to the former function, is to provide some elbow-room to the banks' liquidity management. At such times the reserve requirement need not be met daily, only in the average of the period. With this, the banks' treasuries may handle the balance of their reserve account kept with the central bank as a buffer and may replenish the reserve or draw funds from it above or below the average within the period of placement. It may well be envisaged at system level that the banks may have problems in replenishing the reserve or in tying down liquidity released by the withdrawal of the excess reserve at the end of the period. The central bank attempts to resolve such problems either on a continuous or on an *ad hoc* basis.<sup>5</sup>

A *reserve system with limited flexibility* is built up of the elements of the fully flexible

<sup>5</sup> Carrying over the surplus (or deficit) accumulated by the end of one period to the next or inviting (quick) tenders in the appropriate direction and amount and, as a final resort, the O/N instruments of the central bank interest rate corridor may be used as possible solutions.

and inflexible reserve regulation. Under such regime the central bank provides for the averaging method, while specifying a daily minimum to be met in a given percentage of the reserve. When there is no such mandatory daily minimum requirement, the banks' internal regulations frequently prohibit them from going below a certain part of the prescribed reserve requirement on a daily basis even if it means failure to exploit the opportunities given by the current money market situation for reasons of risk management. When the averaging method is used, it is frequently provided that the balance of the reserve account cannot be in the red, which may also be interpreted as the zero balance being the daily minimum. The surplus or deficit generated in the reserve period and kept with the central bank may be carried forward to the next period in some countries, provided certain conditions are met.

According to one regulation, the reserve requirement ratio is zero but this requirement must be met in average within the period, which means that the balance of the account of the financial institutions kept with the central bank may also be negative (zero averaging).

### *The Current Practice of the NBH*

In Hungary, the Act on the Central Bank provides an opportunity for the NBH to impose the reserve requirement on investment businesses in addition to credit institutions. Nevertheless, NBH Ordinance 1/1996/PK.1 on the reserve requirement extends only to credit institutions including the Hungarian branches of credit institutions with their headquarters abroad.

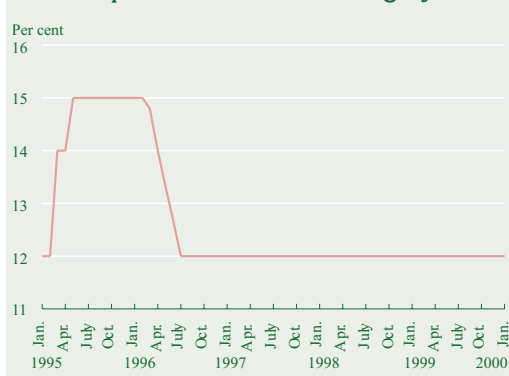
The nominal reserve requirement ratio declined gradually from 17% to 12% in 1996. This was concomitant with widening the reserve base so that the effective reserve requirement ratio did not change. With the last change implemented in 1996 every liability item, within the M3 monetary aggregate and those close to it, came to be included in the base of the reserve. Asset side items ceased to be deductible. Thus, with the exception of internal liabilities, interbank liabilities and liabilities originating from abroad, reserves must be set aside

practically on every bank liability. Now, under the system, which in the meantime underwent minor modifications only, even forint vault cash is included in meeting the reserve requirement. Reserves by certain credit institutions and on certain liabilities had to be set aside at different ratios. In view of their fundamentally different activities (drawing in long-term funds), housing saving funds and the Hungarian Development Bank set aside reserves at 4%. The ratio for at least 3-year securities, publicly issued by credit institutions, was also 4%. The reserve requirement need not be set aside on interbank liabilities, foreign exchange liabilities maturing in more than a year, originating from abroad, and liabilities collected by way of letters of mortgage, issued for at least 5 years. (See figure 22)

Gradually, the NBH will introduce a new reserve requirement system from July 2000. The purpose of changing the reserve requirement system is to create regulations which improve the competitiveness of the banks. The objective is that the reserve regulation should approximate the reserve requirement system applied by the European Central Bank (ECB), thereby easing the shift later. With this the costs of harmonisation will not arise all at once.

The new regulation will do away with the structural disparity arising from different reserve requirement ratios set for foreign and domestic liabilities; the criterion for exemption from the reserve requirement will no longer be the origin of the liabilities, but their maturity. That is, liabilities shorter than

**Figure 22** Changes in the Reserve Requirement Ratio in Hungary



2 years would be subject to the reserve requirement and those longer than two years will be exempt (in accordance with ECB practice). This will abolish the preferential ratios for the Hungarian Development Bank and the housing savings banks as institutions, but as they basically collect long-term funds by far the greater part of their liabilities will be exempt from the reserve requirement.

Gradual introduction means that from 1 July 2000, 50% of the funds originating from abroad and maturing within a year will be subject to the reserve requirement; and 50% of the forint vault cash may be taken into consideration for meeting the reserve requirement; the nominal ratio will be reduced from 12% to 11%. From 1 July 2001 all foreign exchange funds maturing within two years and originating from abroad will be subject to the reserve requirement, and forint vault cash will no longer be an acceptable asset in which to meet the reserve requirement. The level of the nominal ratio to be in force from 1 July 2001 will be determined by 1 June 2001.

The NBH pays interest on the reserve requirement placed with it. Although its rate is lower than the market rate, the income effect (indirect tax) of having to set aside a reserve is no higher than 0.8% even with the high nominal ratio. To offset the additional costs caused by the reserve requirement, commercial banks increased the margin between their deposit and lending rates, i.e. banks ultimately shift the losses suffered in the course of setting aside the reserve to their clients.

By subjecting the full range of short-term foreign exchange funds to the reserve requirement, these liabilities will also be burdened by income withdrawal. This mark-up will have a more vigorous effect in foreign exchange markets because they are characterised by a lower nominal interest rate and a narrower margin. It is not an objective of the NBH to make short-term foreign exchange funds more expensive and thereby to encourage the creditworthy clients of the banks to raise credit abroad.

To that end, the NBH would set the extent of the compensation paid on the reserves, set aside on foreign exchange funds (whether obtained from residents or non-residents), gradually so as to pay 1.5 percentage point higher interest by the end of the transition process. In the first phase and the second phase, the NBH would pay 0.5 and 1.5 per cent higher interest, respectively, on reserves set aside on foreign exchange funds than on reserves on forint funds.

Under the Hungarian reserve regime, the reserve period is one calendar month, which follows the month of the period of calculation (successive period). Every day of the month of the calculation period must be taken into account for determining the base of the reserve. The one-month reserve period was introduced in September 1998 to replace the former two-week period. In addition to providing a higher degree of freedom for banks, the shift was justified by the fact that the one-month period coincided with the frequency of tax and contribution payments. Thus the banking sector must adopt similar scheduling to manage the approximately similar waves of liquidity within the month.

Under the former regime, comprising two periods in one month, it was observed that in the second placement period of the month there was a higher degree of uncertainty in liquidity management (owing to tax payments due on the 20th day of the month), reflected also in the changes of the interbank O/N rates. Because of this, one could envisage a reserve period beginning on the 15th day of the calendar month, covering a whole month, which would provide a longer period for the banks to overcome the shock arising at the beginning of the period.

Within the period, a bank may freely alter the balance of the settlement account as it needs to meet the requirement only in an average of the month, but the balance of the account may never be negative. This rule and the high level of the reserve, taken together, provide a flexible liquidity management possibility for the banks.

The series of the NBH data published in Reuters, which contains the reserve re-

quirement of the banking sector and the stocks placed up to the given date in a time series, also promotes the accuracy of the banks' liquidity management. With this, the banks' treasuries obtain important assistance to estimate the liquidity position of the banking sector expected by the end of the reserve period and, in the light of this, to prepare for making up the deficit or placing the surplus.

## The Basic Set of Current Central Bank Instruments

Before discussing the specific money market instruments the NBH employs, we shall describe the basic types of instruments and their defining features.

### Open-Market Operations:

#### Outright and Repo Transactions

(Under the outright purchase and sale of government papers (outright operations), which count as classical *open-market operations*, the central bank trades in securities, primarily government papers with a view to regulating money in circulation.

Over the past decade, open-market operations have gained in importance in the conduct of monetary policy. This is due to the fact that they have several advantages over other instruments such as refinancing, rediscounting operations, or the adjustment of reserve requirement. They can be flexibly applied for implementing even daily monetary control tasks; they do not have an "announcement" impact (as have, for instance, interest rate decisions). Outright operations are initiated by the central banks; they do not, however, put pressure on the market because they are realised through decisions guided by yields. Their precondition is, however, the existence of an adequate amount of securities, i.e. the existence of an advanced liquid primary and secondary securities market in the given country. In the absence of this condition, classical outright operations became important instruments within the monetary policies of relatively few countries (United States, United Kingdom). With the development of the securities market, however, innovations and methods came into being which did not require similarly high volumes of free liquidity and securities stock as did **outright** operations; yet they proved to be successful in the

fine-tuning of monetary regulation, the regulation of liquidity in the banking sector. Such a typical instrument is the repurchase of securities or the repo transaction (see, in greater detail, under the heading "*Repo*"). In most countries central banks create the necessary stock of securities by organising the primary government paper market or by issuing their own securities.

At the end of the 1980s the conditions in Hungary for performing open-market operations did not yet obtain. The regular Treasury bill auctions (from 1989) and the introduction of the central bank securities account (1992) enabled the central bank to launch repo quotations. Over the years the conditions also matured for performing outright operations and the NBH made active use of this instrument for a longer period. Nevertheless, it never became important in its monetary policy. This is attributable partly to the fact that, by the time the central bank was able to actively use the instrument of selling and buying securities, the **repo** was already in place, which proved to be an efficient instrument for regulating the money supply. (Repo transactions are not restricted by the maturity of the available securities and, through them, it is possible to efficiently influence the central bank's operating interest rate target evenly and constantly over the short term; with the repo, the central bank can be available directly at the announced interest rate or it can issue an interest rate tender). The environment of monetary policy has also changed over time: in the wake of the sustained liquidity surplus and the necessary *sterilisation* by the central bank, the government paper portfolio of the central bank decreased vigorously, thereby limiting the possibility of using the outright (and repo) instruments. The limitations were reinforced by the Act on the Central Bank, according to which the central bank may not buy government papers in the **primary market**. This provision was introduced to adjust to the criteria of the European Union and to keep central bank lending to the budget outside the money market under control.

### Repo

The term is an abbreviation for the "sale and repurchase agreement". A repo transaction is, in actual fact, the result of two transactions whereby the counterparties handle the transactions as a single package. The first leg of the transaction is the **prompt** sale or purchase

of a given security (most of the time some government paper), followed by the reverse of the prompt transaction after the lapse of a specific period of time.

In a repo transaction, the prompt money and securities movements are repeated in the opposite direction at a subsequent date specified in advance, hence the transaction could be interpreted as the result of a securities loan and a money loan in reverse. In general, under repo contracts, the rights linked to the lent security (price and interest income) are due to the original holder. Repo transactions are always motivated by taking out or extending a money loan (under the collateral of adequate securities) or the borrowing of specific securities. The counterparties agree on the original sales and forward repurchase prices at the very beginning of the transaction. The two prices are set so that their difference coincides (conceptually) with the rate on a loan secured by collateral, which is referred to as the repo rate.

The two counterparties to a classical repo transaction are the seller (or lender) who sells his security at the initial date and then repurchases it at a later date and a buyer (or borrower or investor) who practically extends a money loan under the collateral of securities. It is important to note that the above descriptions follow the terminology of the bond market and not that of the money market. According to the terminology of the money market, the lender of the money, i.e. the borrower of the security, is referred to as the lender.

Repo appears in the Terms and Conditions of Business of the NBH in several forms. The central bank's repo terminology distinguishes the repo and the reverse repo. **Repo** is a transaction (in which the counterparty of the central bank is the active party) under which the central bank finances the given counterparty with the backing of government papers. The *reverse repo* is the reverse of the former when the central bank performs a repo transaction with an eligible counterparty in the course of which the central bank extends government paper collateral against liquidity tied down with it for a specific period of time.

The NBH may perform repo transactions employing four forms of sale (see the details below):

- continuously available standing facility
- intermittently available standing facility,
- tender, and
- quick tender.

As far as title to the security used as collateral is concerned, we may distinguish the delivery repo and hold-in-custody repo. In the case of delivery repo, title is transferred for the period of the transaction by the seller to the buyer, who may have free disposal over the security during this period. At the time of the forward repurchase, the buyer has to return the original papers or – depending on the agreement – papers with corresponding conditions to the seller. In the case of hold-in-custody repo, title is retained by the seller, but the seller places the securities in a separate deposit account for the buyer (i.e. blocks them). Should the seller be unable to honour the payment obligations at the date of the repurchase, title to the securities is transferred to the buyer.

Repo transactions have been used by central banks as part of their monetary policy instruments, but their application has also quickly spread to the business sector. Delivery type repo transactions are more widespread in commercial life, because this form provides an opportunity for a multifarious exploitation of the transactions: in the event of delivery-type transactions, money market agents can obtain possession of the paper used as collateral, they may sell them, perform additional repo transactions with them, lend them and put them up as collateral.

In Hungary, the use of repo transactions has been relatively limited in the money markets, although they play a central role in the NBH instruments. The NBH uses the pledge-type repo. From the viewpoint of the central bank, there is no difference of substance between the delivery repo or the hold-in-custody repo on the active side because the central bank does not use the security used as collateral during the period of the transaction, thus it has no significance whether it possesses the paper during that period or not. Depositing the pledge-type securities is the simpler solution. The delivery-type reverse repo of the central bank would have the advantages listed above for the counterparties of the central bank. Its application is, however, impeded by the limited stock of securities that may be used as repo collateral (and another problem may be when the existing stock is not homogeneous), i.e. by the constraints, which, *inter alia*, led to the replacement of the reverse repo with the central bank deposit.

The value of the securities put up as collateral in the course of repo transactions may change during the period of the transaction with the movement in prices. To offset this, it may be useful to *review the value of*

*collateral (collateral assessment)* to check whether the value of the collateral corresponds to the amount of the loan. In the event that the loan is not covered, the seller of the security must effect additional payment which, subject to agreement, may be made by paying cash or blocking government papers. In the opposite event, i.e. when the price of the security rises, the lender of the security may claim reimbursement or request that a part of the blocked amount be released. Collateral reassessment is generally performed daily although, if the security margin (haircut or initial margin) applied initially is sufficiently wide, it is not certain whether daily re-assessment is necessary. The disadvantage of a sizable haircut primarily affects the borrower of the money who can obtain a lower amount of cash against the same security than what he could have obtained had there been daily assessment. The use and size of the haircut depends on the system of collateral assessment and the creditworthiness of the counterparties.

The NBH introduced the so-called normative collateral assessment system in February 1999, whereby the NBH assesses the value of securities accepted as collateral based on a uniform method in the case of its active-side lending transactions. The discount applied in collateral assessment was set broken down into two parts depending on the period of the transaction for O/N and longer maturities.

The central bank set the objective of migrating to daily collateral assessment in the medium term. A daily collateral assessment regime is highly efficient and up-to-date and guarantees the daily automatic review of the value of the collateral, its adjustment in case of any deviation, also providing an opportunity for security substitution, which practice is widespread abroad in the case of repo transactions. It is hoped that the NBH collateral assessment system will also serve as a model for repo transactions concluded by and between market agents because of the daily reassessment of collateral facilitates and the use of genuinely low initial discounts (i.e. less government paper collateral for the same transaction). In addition, this implies the lowest risk among all collateral assessment systems.

#### Swap Transactions<sup>6</sup>

The foreign exchange-forint swap transaction is a transaction in the course of which one of

the counterparties swaps his assets, denominated in forints, with the other against assets denominated in some other currency. Generally, this is a forint initiated transaction as most frequently the counterparty borrowing forints uses the foreign exchange as collateral and pays interest on the forint credit. Currently, **swaps are available** only on the overnight maturity with the same conditions as the O/N repo. In this way the counterparties of the central bank may consider whether they prefer to put up foreign exchange or government paper collateral for the overnight credit taken out from the central bank. Swap transactions represent a negligible volume within the NBH instruments.

#### The Central Bank Deposit in Hungary

As a result of the current structural liquidity surplus, this instrument – with a maturity of two weeks – is the *policy instrument* of the central bank. Central bank deposit means that a counterparty of the central bank places a certain amount with the central bank under specified or evolving conditions (term, interest rate). As against the reverse repo, the central bank does not provide any collateral whatsoever as backing for the amount placed.

The types of deposits sold include the continuously available standing facility, the intermittently available standing facility, the tender and the quick tender. Similarly to repo transactions, there are quantitative and interest rate tenders, interest rate tenders with a quantitative limit, and free forms of tendering among tenders and quick tenders.

In 1997, the NBH deposit was available first for terms of six months, then for twelve months. At the time, its role was to influence interest rates and to reinforce sterilisation. With the introduction of the NBH bond – as its role was completely taken over – the relatively longer-term deposit arrangement was terminated.

In the autumn of 1997 the suspension of reverse repo transaction was necessitated, on the one hand by the fact that the stock of government papers available within the central bank decreased greatly because of the sterilisation of the **liquidity surplus** evolving as a result of the inflow of capital (reverse repo and government paper sales), and there was a danger that homogeneous government paper collateral could not be put up to back some major transactions which, in a technical sense, made the administration of the transactions more difficult. On the other hand, there was no reason why the NBH – as a

<sup>6</sup>In theory and strictly speaking, swap transactions do not constitute part of the forint instruments. Nevertheless, they are discussed here because they constitute part of the interest rate corridor and are fitted into the framework conditions of the repo.



debtor that will certainly pay – should provide collateral for the amounts kept with it. The role of the reverse repo could be fully substituted with the deposit facilities, offering similar terms and conditions, while the technical administration of these transactions was much simpler. From that date, the 28-day money market NBH deposit became the policy instrument of the central bank. The first significant change in the instrument was the shift from continuous availability to intermittent availability. The second change took place in March 1999 when, in order to ease liquidity management by the banks, the central bank shifted from a 28-day deposit to a term of 14 days. Transactions may be concluded at the central bank at a fixed interest rate on the given dates from 10.00 to 12.00 hours.

The interest rate on the central bank O/N deposit facility serves as the floor of the interest rate corridor. This is the O/N fixed-interest NBH deposit facility, which is continuously available. Transaction times range from 8.30 to 10.00 on every day of business.

#### Forms of Sale

The NBH may invite tenders or quick tenders for deposit facilities at any time, for any of the forms (described above) for the purposes of sterilisation, interest rate adjustment or fine-tuning.

Until 1999 the central bank did not use tenders in the case of shorter-term governing and sterilisation instruments, although it had the opportunity to introduce them at any time. Pursuant to the Terms and Conditions of Business of the NBH, there may be several types of tender. They include the interest rate tender, the variable rate tender, the interest rate tender subject to quantitative limits and the free tender. The central bank may use these forms of tendering at its own discretion on both the deposit and the lending sides.

A *fixed rate (volume) tender* means that the issuer sets the interest rate in advance and accepts bids at this rate for the specified amount during a given period. In terms of economic content, this in itself does not differ greatly from the intermittently available standing facility but, owing to a few technical deviations, the difference is indeed significant. One such difference is that there is an announcement of the outcome in the case of the tender from which it follows that the tender may be declared unsuccessful and all the accepted amounts are disclosed to the public. Tenders must be invited separately (that is, at discretionary dates), while the intermit-

tently available standing facility means availability on automatically determined days. Terms may change even on every occasion in the case of tenders, while this is only a theoretical possibility in the case of the intermittently available standing facility.

The essence of a *variable rate (interest rate) tender* is that the issuer announces the amount intended to be sold and bids must contain, in addition to the amount, the offered (or rather the expected) yield. In the course of bid evaluation, bids are ranked according to how favourable they are for the issuer, moving from the most favourable towards the least favourable. Bids are accepted in this order but the amount indicated in the invitation to tender constitutes a top limit. The NBH invites tenders on the preceding day, administers the tender on the day in question and performance is effected on the day following. The central bank handles this instrument as a bid price (Dutch type) tender, i.e. the counterparties of the central bank get (pay) the interest rate offered in their bid on the amount won in the course of the tender. The central bank always has the right to deviate from the amount announced.

In the case of a *fixed rate tender with limited volumes*, the issuer, in addition to the conditions announced for the ordinary interest rate tender, specifies the amount it intends to accept. This means that when the amount of the bids submitted is higher than the amount indicated, the amount is distributed pro rata to all the bids.

*When free tenders are invited, the issuer does not announce either a limit amount or an interest rate. This means that the issuer decides on the accepted bids enforcing interest rate or quantitative preferences (or some combination of these according to some criteria) with respect to the bids ranked in accordance with the allocation procedure described under the variable rate tender. The free tender is administered in the bid price form.*

Many central banks apply interest rate tenders regularly in pure or quantitative limit forms because through them they can influence interest rates in a more **transparent** manner.

### Interest rate corridor

The purpose of the central banks' **interest rate corridor** is to prevent wide fluctuations in the **interbank interest rate level**. The top

of the interest rate corridor (the interest rate ceiling) means, in this context, that the bank determines the lending rate at which it extends credits to eligible counterparties for a term of one day without limitation. When banks have an extraordinary need of short-term liquidity but, for some reason, have no opportunity to obtain it from the banking sector, interest rates in the interbank money market cannot go up to extreme heights, because the central bank satisfies all demand at a relatively high interest rate level. This means that the interbank O/N rate cannot be higher than the interest rate ceiling.

Similarly, the rate indicated by the central bank at eligible counterparties are entitled to perform overnight deposit or deposit-type transactions with the central bank is referred to as the *bottom of the interest rate corridor (interest rate floor)*. At times, the interest rate declines in the O/N interbank market when liquidity, which can be tied down only with difficulty, is available to the money market for a transitory period. The purpose of the interest rate floor is to halt the decline in the interest rate at a relatively low point. At this rate, credit institutions may place their superfluous funds overnight with the central bank without limitation, thus banks have no interest in concluding overnight interbank transactions at a rate lower than the bottom of the interest rate corridor. (See Figure 16 for changes in the interest rate corridor.)

The instruments of the interest rate corridor apply virtually without exception to active or passive overnight operations, whereby extreme interbank interest rate volatility can be contained.

It happened – inter alia, in Hungary from the middle of the 1990s until September 1998 – that the interest rate corridor could be interpreted for longer than overnight maturities

<sup>7</sup> Repo lines are determined automatically once every quarter. The base of the repo line calculation is the lower of the balance sheet totals of the last two balance sheets submitted to the Supervision in every quarter. The bank's repo line increases with Ft200 million for every Ft10 billion of the balance sheet total, although it may never exceed Ft30 billion. Having set the new repo line, it enters into force on the 10th day of the second month following the quarter.

(for instance, one-week active and reverse repo).

Generally, the most frequent transactions at the top of the interest rate corridor are O/N repo, lombard loan, overdraft or swap. Of the instruments on the passive side, the O/N reverse repo or the deposit are typical. In all these cases, the transaction is concluded at a predetermined rate upon the initiative of the eligible counterparties (generally, credit institutions).

### *The Current Practice of the NBH*

In Hungary the interest rate corridor as it is understood today, i.e. an instrument which involves the top and bottom limit for **interbank** rates, has been in existence since 1993. Although the band was, at times, rather wide, it operated with instruments of various maturities, so it did not always constitute an effective constraint for O/N money market rates.

At present the ceiling of the interest rate corridor is the O/N **repo** (swap) rate, while the floor is the O/N deposit rate. The ceiling is atypical in international practice in the sense that even though the instrument behind it is a standing facility, its use is subject to a quantitative limits. Under the current system this means that every credit institution is allocated a repo and swap line based on its balance sheet total and they may make use of repo borrowing at the given interest rate up to that amount.<sup>7</sup> Should that be insufficient, the counterparty may resort to additional repo beyond the repo line allocated to it, relying on the freely disposable government paper stock of the central bank. This, however, is available at a substantially higher interest rate. Another important point to note is that transactions concluded for such instruments are settled on the day of the transaction.

The rate on the overnight deposit of the central bank constitutes the floor for overnight interbank rates. With this, the NBH is available to the banks without limitation (*continuously available standing facility*). Fluctuation in interbank rates is also re-

duced by the gradual approximation of the O/N central bank deposit rate and the level of the repo rates. Owing to this, the NBH gradually reduced the width of the effective interest rate corridor from the second half of 1998.

The purpose of narrowing the interest rate corridor is to decrease the overnight interest rate volatility of the Hungarian money market, as is done in the advanced countries. (See Figure 23)

Earlier, the central bank used to offer the *continuously available standing facilities* at several maturities. Currently, in its pure form, it exists only in the case of overnight deposits. The O/N repo facility at a standard interest rate was available to counterparties up to the repo limit, above which they could use supplementary repo. In the case of supplementary repo facility, the top limit for transactions is the freely disposable government paper stock held by the central bank. In terms of the sales channel, O/N swap transactions, which constitute part of the repo line, are treated the same way as the repo. There have been examples when the central bank sold NBH bonds or other government papers as a standing facility at dictated yields; this deviates from the pure form in that the depletion of the stocks may disrupt continuous availability (as happened in relation to the prompt security sale and purchase transactions of the central bank).

For a long time the Hungarian inter-bank interest rate corridor was extraordinarily wide by international standards (a width of 8–12 percentage points was also noted). One of the underlying reasons was that from the summer of 1995 active-side rates were not genuinely effective owing to their relatively high level, i.e. practically neither of the instruments played the role of an interest rate ceiling. So, the active O/N rates did no more than follow the frequent re-pricing of the main (governing) instrument or that of the passive-side O/N instrument in steps of adjustment. (Keeping active-side rates at an artificially high level was warranted by the need for sterilisation.)

*Figure* Elements of the O/N Interest Rate Corridor in Hungary

Name of instrument	Direction of operation	Form available on the market	Frequency of application
O/N active repo and swap	active side	standing facility up to the amount of the repo line	ad hoc in the event of liquidity shortage
Repo supplementing the active repo line	active side	standing facility	not used since 1995
O/N deposit	passive side	standing facility	ad hoc in periods of about liquidity

Until 1997 the central bank offered pledge-type reverse repo facilities on a continuous basis at the bottom of the interest rate corridor.

The central bank endeavours not only to reduce the width of the interest rate corridor to the optimal level but also to keep the rate on the policy instrument in its centre, so that the rates on the two O/N instruments, working in opposite directions be located symmetrically around it.

## The Policy Instrument

In the case of countries pursuing a monetary policy with the interest rate as their **operating target**, the policy instrument is the one whose purpose is to assert the interest rate which the central bank regards as optimal, and which it also intends to mediate in the market at the maturity that is most important from the viewpoint of transmission, taking into account the effectiveness of central bank intervention, without eroding it. This is most frequently done with a posted interest rate when the central bank determines the rate on the given instrument.

When there are no extraordinary events to disturb the money market, i.e. a

condition of peace prevails, a portion of transactions come into being between the central bank and its counterparties at the **policy rate**, through which the **monetary authority** is able to exert a direct and highly effective influence on the money market.

Similarly, the signalling role of the *interest rate (change in the interest rate)* of the **policy instrument** is also important. Frequently, expectations concerning changes in the **key interest rate** have an impact on the interest rates in themselves. When the central bank's policy coincides with the expectations of the market, another signal is emitted indicating that the assessment of the financial and economic processes by the market and the central bank is similar. The signal is more spectacular when the central bank takes an interest rate step that deviates from market expectations (or when it does not take the decision expected by the market). At such times market agents, in addition to having access to central bank instruments at terms and conditions different from their expectations, experience that the central bank evaluates macroeconomic processes differently, which motivates them to re-evaluate their own interest rate policies. Thus, the central bank is able to generate changes going significantly beyond the direct market impact of the interest rate change in the money market.

Internationally it is not typical for the policy instrument to have no predetermined interest rate, being left to evolve in the market (e.g. in the course of auction sales). However, we can find examples of no being linked to the policy rate, which is published by the central bank as the one deemed desirable by it over the short-term and which the market takes into account.

The particular form (especially the lags) of the *transmission mechanism* has a fundamental significance in determining the maturity of the policy instrument. This

means that the maturity of the central bank facility, which is closest to the period over which banks re-price their variable long-term rate loans, can have the most direct impact on the real economy. At the same time, it should also be taken into account that central bank transactions become less effective and highly costly for longer maturities whenever the expectations of the market differ from those of the central bank. Therefore an equilibrium maturity must be found, with which the central bank is able to influence changes in market yields with adequate effectiveness.

### *The Current Practice of the NBH*

The maturity of the deposit instrument regarded as governing in Hungary is two weeks with settlement and payment on the day following the conclusion of the transaction. The NBH chose the two-week facility as its policy instrument because this is the optimal maturity for the central bank for the following reasons:

- it enables the central bank to exert a still adequate impact on the 3-month maturity, which is of outstanding importance for transmission (see the discussion under the Transmission Mechanism),
- it should not be so long as to force the central bank to move in a direction corresponding to expectations because of the strong effect of excessively large or low deposit placements based on excessive expectations concerning the interest rate measures of monetary policy (speculation), and
- it should provide adequate assistance to banks in liquidity management; as the reserve period is one calendar month, the two-weekly instrument is expedient for tying down liquidity in an adequately safe manner.<sup>8</sup> Using the two-week instrument, the central bank may effec-

<sup>8</sup> Until the autumn of 1998, the policy instrument and the instrument used for liquidity management within the reserve period were separate. Until then the reserve period lasted two weeks (or to be more accurate, there were two reserve periods every month), during which banks could bridge liquidity problems using the one-week deposit (or repo). The policy instrument was the 28-day deposit.

*Figure* Instruments Determining the Policy Rate Used in Hungary from 1993

Name of instrument	Direction of operation	Form available on the market	Term	Frequency of application
Repo	active side	standing facility	1 week, or 28 days	1994-middle of 1995
Reverse repo	passive side	standing facility	28 days	from mid-1995 to October 1997
28-day deposit 1 month	passive side	standing facility	28 days	from October 1997 to 1 March 1999
14-day deposit 2 weeks	passive side	intermittently available standing facility	14 days	from 1 March 1999

In the course of 1994 and 1995, first the 1-week then the 28-day repo dominated the transactions of the NBH. This, however, cannot be unambiguously attributed to its function as policy instrument but to the secure income which can be achieved by buying government papers, and the financing needs of the banks with liquidity shortage.

tively influence the 3-month market yield and the pricing behaviour of banks.

The central bank was available with the policy instrument twice a week in 1999 and once a week from March 2000, when the 3-month NBH bond was introduced (*intermittently available standing facility*). Eligible counterparties could conclude transactions with the NBH between 10.00 and 12.00 hours at the interest rate announced in advance. The financial settlement of the transactions was effected on the following day.

*The intermittently available standing facility* means that the central bank is available during the day, similarly to the continuously available standing facility, but only on predetermined days (e.g. on Tuesdays and Thursdays). The advantage of the intermittently available standing facility over the continuously available one is that the direct setting of interest rates becomes more moderate owing to the less frequent possibility of executing transactions. Also, it encourages banks to be more active in their liquidity management, i.e. to assess their liquidity positions in advance and develop their expectations accurately, which improves the effectiveness of the transmission mechanism. The NBH makes its governing two-week deposit

facility available intermittently. Thus, apart from extraordinary cases, the central bank assists credit institutions in balancing their liquidity positions only at the edges of the interest rate corridor, on three out of five working days a week, and on four days a week as of March 2000.

### The Instruments of Sterilisation

Generally, *sterilisation* is effected in countries where capital inflow through *foreign exchange market intervention* leads to such an expansion in the money supply that, without its neutralisation, it would have an inflationary impact. *Neutralisation (sterilisation) of excess liquidity* arising from the conversion of foreign exchange flowing in from abroad by central banks has been particularly characteristic in the countries of central and eastern Europe in the transition period. The reason for this includes the fact that the countries of the region have used the exchange rate as the **nominal anchor** in most periods; consequently, they were forced to effect *foreign exchange market interventions* from time to time. Also, to curb inflation and to maintain the external equilibrium at the desirable level, central banks attempted to dampen the pace of interest

rate decreases, hence the so-called sterilisation instruments offered attractive rates.

In the course of sterilisation, the central bank must take safety and cost considerations into account. With a view to the safety of the exchange rate regime, the central bank, in the course of sterilisation, attempts to tie down excess liquidity in the banking sector on *longer maturities* so that, in the event of the withdrawal of foreign exchange not justified by the main macroeconomic indicators, the position against the central bank should not be suddenly dismantled, and foreign exchange movements not supported by the macro indicators should take place more slowly. In addition, the central bank, besides considerations of inflation and the balance of payment, has also to bear in mind the *costs of sterilisation*. By keeping the costs of sterilisation at as low a level as possible (taking into account from another aspect that there must be an adequate *real interest rate* as well), the central bank's aim is that the spread between the yield on risk-free papers denominated in the local and foreign currencies should not generate capital inflow for speculative purposes, which should later be sterilised.

### *The Current Practice of the NBH*

The operation of the crawling exchange rate of the forint within a band of intervention means that the NBH has an automatic obligation to buy or sell (to intervene) at the edges of the band. This also means that incoming foreign capital appears at the central bank, increasing foreign exchange reserves. A sudden reduction in the foreign exchange reserves of the NBH, caused by any external or domestic shock, constitutes a risk. (The weakening of the exchange rate may induce the sale of foreign exchange for some period of time at the

lower point of intervention through the standing facility and, in the course of the sale, the Bank must also be available at the edge of the band.) Therefore, in order that the foreign exchange reserve should not be depleted quickly, the NBH attempted to lengthen the duration of the sterilisation stock using various instruments (6-month and 12-month deposit and the NBH bond).<sup>9</sup> These efforts of the central bank went hand in hand with a rearrangement in the structure of the sterilised stock by maturity. (See *Figure 2* )

#### **The NBH Bond**

The NBH bond is a debt security issued by the central bank which, pursuant to the ordinance determining the range of securities acceptable as for repo transactions, may be used by its owner for repo transactions with the central bank. (Ultimately, NBH papers are just as risk-free as government papers as the owner of the central bank is the state, the NBH pays its profits to the budget and the budget covers its eventual losses.) The NBH bond was first issued in June 1997, in addition to meeting the sterilisation need also with a view to ensuring sterilisation on longer maturities. Then the central bank was continuously available with the bond, limited only by the amount issued for the given period. The NBH chose the issuing technique according to which it placed the bonds in its own account and sold them from there for a month. At the end of the given month, the bonds remaining in its own portfolio were annihilated and a new series was issued. In this way intervention at a fixed rate was effected practically at an interval of between 11 and 12 months.

By April 1998, it was no longer necessary for the central bank to directly set rates on the maturity of between 11 and 12 months, although excess liquidity still had to be tied down permanently. Thus, the new series of NBH bond were placed on the market using auction sales. Auctions were held every two weeks and the central bank again offered the bond from its own account until the stock was depleted or the period to maturity reached 10 months. At the auction the central bank announced the amount intended to be sold, and the banks could submit their bids between 9.00 and 11.00 hours. Once the bids were submitted the Auction Committee examined whether it was necessary to alter the amount by a maximum of 25 per cent rela-

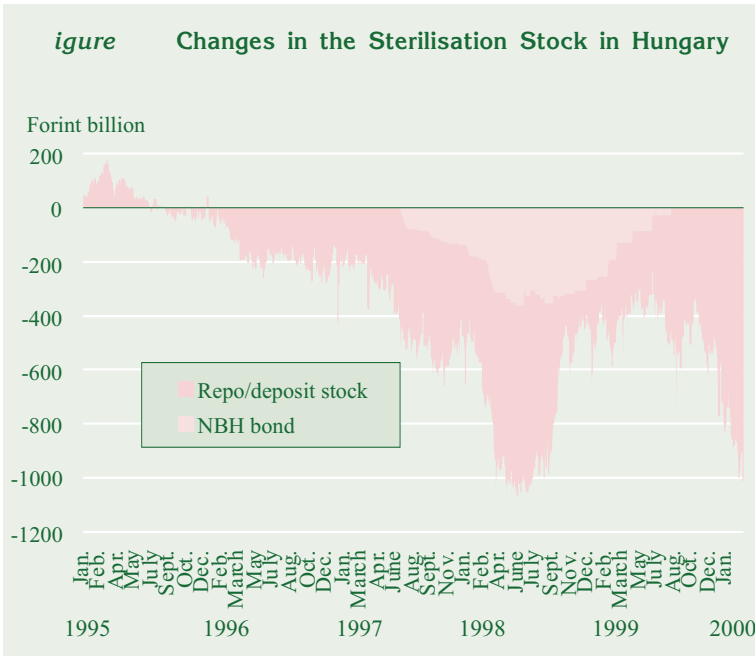
<sup>9</sup> In the case of the government paper outright transactions applied in 1997 for the last time; government papers with a period to maturity of 9 to 15 months bearing fixed interests were sold.

tive to the amount offered or whether the auction should be declared unsuccessful in the event where bids were found to be extremely different from market conditions. The NBH

plied for reasons already discussed (the limited government paper stock of the NBH). In addition to the 2-week deposit, the 3-month NBH bond has assisted sterili-

sation since March 2000. When issuing the bond the central bank invites free tenders to tie down liquidity (without determining either the amount or the interest rate), i.e. it applies an auction technique whereby it affects interest rates only indirectly. (See Figure 26.) As far as the elements of the instruments used for sterilisation are concerned, the period of the instruments and the method of setting the interest rate are important. In the case of dictated (fixed) interest rates, the

Figure Changes in the Sterilisation Stock in Hungary



bond is financially settled on the second day following the transaction.

In the potential instruments of the NBH there are three types of instruments suitable for sterilisation. These include the *reverse repo*, the *standing deposit* and the *NBH bond*. Their method of issue and period differ substantially. Since one-year NBH bond auctions were terminated in October 1998 and they matured one year later, the sterilisation instrument within the NBH instruments was the 1-month and, subsequently, the 14-day deposit, which also played the role of the policy instrument.

The reverse repo is not among the instruments ap-

Figure Potential Instruments of Sterilisation

Name of instrument	Form available on the market	Maturity	Characteristic period
28-day reverse repo	standing facility	28 days	from March 1995 to September 1997
28-day and 14-day deposit	first standing facility, then intermittently available standing facility	28 days, then from 1 March 1999, 14 days	from September 1997
6-month and 12-month deposit	standing facility	6 and 12 months	from January–June 1997
NBH bond	availability, then auction	between 12 and 11 months, then 12 and 10 month, 3 months	from July 1997 to October 1998 from March 2000

monetary decision-making body must continuously review the interest rate and introduce changes from time to time in accordance with expectations concerning the real interest rate and the spread. In the case of the sterilisation instrument sold indirectly – largely by way of *quantitative auctions* – the interest rate evolves at the auction (in the case of deposits, at the tender). The NBH makes sure that, if possible, nobody should obtain the bond at a level above the equitable yield. To that end, the central bank is entitled to determine the amount issued in 75–125 per cent of the amount offered. By using the free tender, the central bank, while maintaining its intention to effect sterilisation, refrains from directly influencing the *yield curve*.

As already mentioned in the chapter on transmission, the extent to which the central bank ties down free liquidity in the banking sector may have significance for the effectiveness of regulation. Active-side operations may be more effective from the viewpoint of the central bank in influencing interest rates because they force credit institutions more strongly to apply the rates dictated by the NBH: their liquidity position does not enable them to make up for the structural deficit from other sources in the banking sector. From the viewpoint of the transmission, the rippling on of lending rates to the real sector presumably takes place more rapidly in the event of active regulation. When the liability costs of the banks are raised (for instance, because of an increase in the rate on the active central bank instruments), the bank suffers an effective loss unless it raises the price of financing. In the event of passive-side operations, however, the banks, when they do not follow the interest rate measures of the central bank, “only” lose a surplus revenue when they fail to place their excess liquidity using the optimal facilities. It should, however, be noted that in the case of cost-sensitive banks competing against one another the two liquidity situations should not result in differ-

ences in the banks’ reactions to the steps of the central bank (transmission).

When commercial banks can meet their reserve obligations or have the settlement deposit stock required for the safe administration of business through short-term credits (shorter than the reserve period) (for instance, repo), we may speak about a situation of liquidity shortage. In most countries where there is no considerable foreign exchange market intervention, central banks attempt to create such situations of **liquidity shortage**. The Bank of England, for instance, ensures liquidity shortage in the very short term by issuing 3-month securities, thereby guaranteeing the effectiveness of short-term active instruments.

In contrast, in countries – including Hungary – where there is significant foreign exchange market intervention, the **interbank market** is characterised by ample liquidity. This means that commercial banks are able to meet the reserve requirement without borrowing from the central bank, i.e. they are able to have the required settlement deposit stock. In this case commercial banks place their free reserves in the form of assets bearing market interest (sterilisation instrument) outstanding against the central bank.

The size of the sterilised stock at the NBH is so large that the creation of a structural liquidity shortage is not on the agenda in 2000. In the event of a lower stock, when it will be possible to transform the sterilised stock kept with the NBH into longer-term instruments at relatively low cost, a sustained liquidity shortage can be created, leading to the policy instrument of the NBH operating again on the active side.

## Liquidity Planning and Fine-Tuning with Tender

### *The Role of Liquidity management*

As discussed in the chapter concerning their objectives, in order to implement their ultimate goals central banks follow **operating targets** in their day-to-day operation. Their continuous market presence is called to fa-



cilitate the realisation of these targets. Pursuing an operating target, whether it is the interest rate of a preferred maturity (characteristically from 3 months to 6 months) or influencing the growth rate of the **monetary base**, they exert their influence through the transmission mechanism on the variables relevant with respect to the **intermediate** targets and the ultimate goal. The counterparties of central banks are the commercial banks, hence it is obvious that the operating target is formulated in terms of the achievement of a level of a quantitative or yield variable, regarded as optimal, which is of crucial importance for the banks. Concretely, the operating target of the central bank is to influence the *amount or cost* of the reserve money (central bank money) available to the commercial banks.

As mentioned when discussing the banker of banks function, the demand of the banks for reserve money stems from three sources. First, banks need vault cash to satisfy the cash needs of their clients. Second, administration of day-to-day transactions necessitates that the banks have claims against the central bank, which can be promptly exchanged for cash. Third, the banks must meet the reserve requirement prescribed by the central bank. The reserve requirement sets the level of the stock of bank money at a higher level than what would evolve without it.

Through its *open-market operations*, the purchase and sale of government papers and its own instruments, the central bank provides or withdraws bank money from the interbank market. The objective of these measures is that, through modifying the demand and supply conditions in the reserve money market, the central bank directly or indirectly influences the funding costs of the commercial banks or the yield of the assets of the banks placed with the central bank. With this, the central bank prompts banks to restructure their balance sheets or, on the contrary, prevents a balance sheet restructuring regarded as undesirable from the viewpoint of monetary policy.

These transactions are the first steps in the **transmission mechanism**. The permanent alteration of the liability costs of commercial banks or of the yield of the central bank instruments available to them induces different stock and yield changes, which ultimately result in a modification of the course of the real economic variables. With some simplification it may be stated that the central bank reaches its ultimate goals by influencing the yields evolving in the **interbank** market. Liquidity management can therefore be regarded as the lowest level of monetary policy, which is an indispensable condition of the implementation of the ultimate goal.

**Liquidity management** may be discretionary or accomodative. When *discretionary regulation* is applied, the central bank decides in what amount it accepts deposits (or sells government papers) from/to the banking sector or offers credits to them under various facilities (or buys government papers). In short, it is the decision of the central bank and not that of the commercial banks that determines the liquidity of the banking sector.

The *objective* of the accomodative regulation is also to influence the liquidity of the banking sector. In this case, however, the central bank operates with standing facilities.

This means that the central bank offers funds and accepts deposits at predetermined interest rates, but the banks can make use of these according to their needs. In this way liquidity management is in the hands of the banking sector and we cannot speak about active liquidity management by the central bank.

The two regimes, although they fundamentally differ in their operating mechanisms, serve the same purpose, namely to reach a level of interbank rates which is in line with the central bank's targets. With discretionary regulation, the central bank influences indirectly through volumes; under the accomodative regulation it influences them directly.

The precondition of discretionary *liquidity management* is liquidity planning *by the central bank*. In the case of accommodative regulation, what the central bank does is more in the nature of liquidity monitoring, an examination of the self-regulatory behaviour of commercial banks within the framework conditions created by the central bank's rules and instruments.

When liquidity forecasts are of appropriate quality, the central bank may supplement the **interest rate corridor** and the **key policy instrument** with the *quick tender* used for the fine-tuning of liquidity. Quick tenders are generally applied in two cases. If, at the end of the reserve maintenance period, the banks would not be able to meet the reserve requirement owing to some liquidity cutting shock (or because they simply have miscalculated) the interbank demand for free liquidity in the banking sector may rise and this may, for a transitory period, induce exceedingly high interest rates (generating volatility). Then a situation of liquidity shortage may arise, which may be remedied by a money providing quick tender. The other case may arise owing to unexpected, significant capital movements abroad. In such cases, in the event of major capital inflows over a short period of time, an additional sterilisation pressure, difficult to plan for in advance, would be exerted on the central bank, which may induce the bank to apply a quick tender for deposits.

Central banks must be highly circumspect with the regular use of the quick tender because when it is frequently invited a kind of *moral hazard* may arise; the banks will make less of an effort to manage their liquidity position perfectly during the period, as they can be sure that they can rely on the central bank.

In countries where they have introduced the quick tender and the central banks' liquidity management functions effectively, the decision on inviting quick tenders can be made on the basis of very short-term liquidity forecasts, even over an hour.

The method of administering quick tenders – generally with a different eligibility criteria for counterparties and dates – is similar to that of the ordinary tender.

### *The Current Practice of the NBH*

The monetary policy instruments of the NBH – with one exception – operate in the form of standing facilities: the central bank accepts overnight or two-week deposits (on this maturity, availability is intermittent) or grants overnight credits *at a given rate* in accordance with the needs of the banks. The latter facility is available to the banks only within the limit specified in proportion to their balance sheet total (repo line) but, within this limit, they are free to decide on the amount.

When, as a result of unforeseeable events, the supply of central bank money significantly decreases, the reserve stocks of a few banks may sink so low that they are unable to meet their reserve requirement without getting funds through repo. The negative impact of the factors influencing liquidity may be so great that commercial banks are unable to raise their reserve stocks to a level corresponding to the reserve requirement even by exhausting their repo line in the remaining part of the reserve period. In such a situation interbank rates may rise above the overnight repo rate (that is, outside the interest rate corridor).

The January 1999 introduction of the *quick tender* aimed to eliminate such situations of temporary liquidity shortage. The NBH, depending on whether or not it regards a rise in interbank rates desirable, may decide whether or not to provide liquidity to the banking sector in the form of a quick tender. The quick tender is the only typical *discretionary* element of the central bank's instruments, which also provides an opportunity for active liquidity management. In addition, the business conditions of money market operations enable the NBH to offer the two-week deposit, which is its policy instrument, not at a given interest

rate but by announcing its amount to the banks. In Hungary there were fundamentally two reasons for including the quick tender in the set of instruments. On the one hand, it was introduced to reduce the impact of unexpected, significant money movements justified by international events but not supported by changes in macroeconomic parameters. The other reason was to facilitate liquidity management, particularly with respect to the last days of the reserve period, which are difficult to plan for.

All the types listed under tenders also exist for *quick tenders* on both the active and the passive sides. The advantage of the quick tender is that it can be administered even in a single day as it is announced before 8.00 a.m. and results are declared as early as 9.00 a.m. Financial settlement is effected the very same day. Bids to the quick tender can be submitted only through Reuters; any one counterparty (which must be a bank) can submit only one bid and the bid must be fully divisible by Ft500 million.

The series of international events in 1997–98, which resulted in a decline in international confidence in the region and investors having a propensity to overreact to the effects of the crisis and to assess the stability of the countries of the region not on the basis of real threats or the fundamentals, facilitated the introduction of the quick tender in Hungary.

At such times, the central bank may, with a view to protecting the interest rate and the exchange rate, perform rapid and transitory intervention.

The central bank may intervene in the foreign exchange market, may reduce the extent of **intervention** or may even substitute intervention by inviting quick tenders in the forint market. Then the quick tender must be of a rate taker type, that is, only quantitative and free tenders can be considered.

When the central bank is able to properly quantify the expected outflow of foreign exchange in a situation near to crisis, then it is worthwhile to tie this (or a part of it) down in the forint market through a variable rate tender. When, however, the forecast is not

sufficiently reliable, the use of a free tender is more expedient.

Approaching the end of the reserve period, it happened that banks tried to find the missing reserve amounts and place them “fighting the fires”. In the event of low system liquidity, they could obtain these amounts only at high interbank or repo rates (at the level of the interest rate ceiling), which introduced considerable volatility to interest rates and substantially diverted the interbank money market. At other times banks set aside excessively large amounts early in the period in the belief that they would be able to place their excess liquidity profitably by the end of the period. These situations can best be remedied by an *interest rate tender subject to quantitative limit* as the liquidity shortage or surplus can be quantified at the level of the system. The central bank can determine the interest rate and can force the banks to accept it. The quantitative limit serves the purpose of preventing tensions in the system caused by the liquidity deviation appearing at the level of the banking sector, and the deviation of the accumulated liquidity shortage or surplus of individual banks. The first two repo quick tenders invited at the end of January 1999 in Hungary were also implemented in the form of interest rate tenders subject to quantitative limits.

Fine-tuning requires proper liquidity monitoring and forecasting at the level of the banking sector. Proper information flow between the central bank and the budget is important for this.

The NBH daily monitors changes in the banks' payments and their tied-down liquidity and continuously updates the liquidity forecasts for the immediate future. Whenever the banking sector lands in a situation of transitory liquidity disturbance (low or abound liquidity), the central bank may consider whether it will leave interbank rates to significantly shift within the boundaries of the interest rate corridor, or to let changes in the forint money supply be dealt with through foreign exchange market intervention, or to prevent transitory interest rate

volatility (which may have a disturbing effect and may be unjustified) by way of a quick tender.

### Liquidity Planning

Owing to the largely adjusting nature of its instruments, the significance of liquidity planning pursued at the NBH is substantially less than in the case of central banks pursuing discretionary regulation. At the same time, the continuous monitoring of the liquidity and behaviour of the banking sector provides valuable information concerning the expectations of the market and the eventual need to modify the instruments or the framework conditions of the interbank market.

Liquidity planning at the central bank fulfils its classical function not in ordinary situations but when quick tenders are announced. The decision on the amount of credit offered through the tender may be made after assessment of the factors influencing the reserve stocks of the commercial banks in the remaining part of the reserve period.

Liquidity planning involves the systematic ordering of the factors which are expected to shape demand for and supply of central bank money, i.e. taking stock of the asset and liability side items of the central bank balance sheet. *Figure 27* presents the schematic central bank balance sheet which the NBH uses for liquidity forecasting.

From the viewpoint of liquidity planning, the banks' reserve stock is of interest because that determines the demand of the whole banking sector for bank money. In the course of liquidity management and monitoring the liquidity position, the central bank examines every factor from the viewpoint of how a change in the given item of the central bank balance sheet affects the banks' reserve stocks.

Changes in some of the balance sheet items do not influence the account balance of the commercial banks. The most important of these items are the transactions between the budget and the central bank. When for instance, the Treasury repays a loan to the NBH, this reduces the balance of credits to the budget (asset side) and the balance of the Unified Treasury Account

*Figure* The Simplified Balance Sheet of the NBH

Assets	Liabilities
Claims on general government	General government deposits
Forint credits	Treasury Unified Account
Foreign exchange credits	
Claims on banks	Bank deposits
Refinancing credits	Settlement deposit account (reserve account)
Repo	Vault cash
Claims on non-residents (foreign exchange reserve)	Two-week deposit
Other	Overnight deposit
	NBH bond
	Banknotes and coins outside the banking sector
	Foreign debt
	Other
	Equity

Together with the deposit of ÁPV Rt.

(liability side). Net interest payments between the central bank and the budget alter two liability-side items which do not affect commercial banks: the balance of the Unified Treasury Account and the central bank's profit. When the foreign exchange position of the central bank changes, again only the transactions vis-à-vis commercial banks are of interest (**foreign exchange market *inter ention***), as the transactions of the central bank and the budget in relation to the foreign exchange debt have no liquidity impact, i.e. they do not influence the reserve position of the commercial banks.

To predict the bank money stock of commercial banks a *forecast* must be prepared for each of the above-mentioned variables. With the forecast it is possible to calculate the monthly average expected balance of the reserve accounts without placement of deposits and borrowing by commercial banks. Then this stock can be compared to the reserve requirement to be met by the commercial banks in the remaining part of the month.

The difference between the two figures is the free liquidity in the banking sector, that is the amount which the banking sector must place at the central bank until the end of the reserve period. When the monthly expected reserve stock is short of the *reserve requirement* to be met, a liquidity shortage has arisen. Then commercial banks must borrow from the NBH in the form of a *repo* in order to be able to meet the reserve requirement.

### *Liquidity Surplus and O N Rates*

As a result of the capital inflow of the past few years, the Hungarian banking sector has been characterised by a substantial *liquidity surplus*, that is, banks have more central bank money than would be necessary to meet the reserve requirement. In this way, free liquidity is largely positive, the banking sector has superfluous reserves. Individual banks may reduce their surplus reserves by offering **interbank** credits, the entire bank-

ing sector can, however, do so only by placing deposits with the central bank. The two-week deposits account for by far the majority of placements, because their rate is substantially higher than that of the overnight instrument.

The banks' objective is to gradually divest themselves of their surplus liquidity to achieve the *highest possible interest income*. By the last day of the month, they must reduce their free liquidity to a minimal level, because the NBH does not pay an interest on the average account balance over and above the reserve requirement.

The free liquidity of the banks is the amount which, according to the current expectations concerning changes in the factors forming liquidity, is not needed for meeting the reserve requirement. Changes in the factors influencing liquidity cannot be forecasted with absolute certainty, hence free liquidity can also not be accurately determined. Banks are well aware of the fact that a number of unpredictable factors influence liquidity until the end of the reserve period, which may divert free liquidity from its value expected at the moment.

The real problem for the banking sector arises when their free reserves at the end of the month are in the red, i.e. they need to take out expensive central bank credit to meet the reserve requirement level. To avoid this, banks attempt to keep the level of their free reserves at a positive level throughout, that is, they build up a security stock capable of absorbing negative effects affecting the reserve account (such as the impact of tax payments substantially higher than expected).

With the progress of the reserve period, the uncertainty around the end of the month reserve position declines, thus even a lower free liquidity stock will provide a sufficient margin of safety.

*The level of free liquidity* in the banking sector *has a close inverse relation to interbank rates*. When banks have ample free reserves, they place their money in central

*Figure* Individual Functions and the Basic Forms of the Assigned Instruments

	Interest rate corridor	Policy instrument	Sterilisation	Fine-tuning
<b>Repo</b>	O/N repo	7-day maturity until the summer of 1995		quick repo tenders
<b>Reverse repo</b>	O/N reverse repo until October 1997	from the summer of 1995 to October 1997 with 7, then 28 day maturity	until October 1997, maturity of 28 days	possibility of inviting quick reverse repo tenders
<b>Swap</b>	O/N swap			
<b>Deposit</b>	O/N deposit from October 1997	28-day maturity from October 1997, 14-day from March 1999	28-day from October 1997, 14-day from March 1999	possibility of quick deposit tenders
<b>Sale of government papers</b>			in 1997 for the last time	can be announced when needed
<b>Purchase of government papers</b>				can be announced when needed
<b>NBH bond</b>			standing facility with a maturity of one year from July 1997 to April 1998, then auction sale until October 1998. From March 2000, free tender with a maturity of three months	

bank deposits and its yield will govern interbank rates.

When, however, the majority of banks are dissatisfied with their own reserve positions, i.e. they assess their free liquidity as insufficient, their growing demand for reserves will drive interbank rates above the level of the central bank deposit rate.

The equalising mechanisms of the interbank market guarantee that the global liquidity surplus of the banking sector will approximate to the positions of individual banks.

Accordingly, the NBH is able to forecast the movement of interbank rates without examining the positions of individual banks, merely on the basis of the forecast of global liquidity.

The NBH discloses the reserve stock of the commercial banks via Reuters. Supplementing the public information disclosed by the NBH with individual information about liquidity among their own clientele, banks are able to draw conclusions concerning the liquidity position of the banking sector and also the expected movements in O/N rates. (See *Figure 28*)

## Individual Elements in Operating the Instruments

### Eligible Counterparties for the NBH

The counterparties of the NBH eligible for monetary transactions generally include all legal entities that are or may be in some kind of a business relationship with the central bank while it performs its monetary functions. This exceedingly broad interpretation covers not only the multitude of counterparties who enter into contact with the central bank in relation to implementing the objectives of monetary policy, but also those whose accounts are managed by the NBH.

The central bank is able to determine the group of eligible counterparties for a given type of transaction in order to achieve its monetary policy objectives. First, it can *directly* determine this circle and second it may *include conditions* among the Terms and Conditions of Business for the given instrument, which either bar certain institutions, otherwise eligible, from entering into the given transaction or render it very difficult for them to deal with the central bank.

The NBH separately specifies its eligible counterparties for every one of its monetary policy instruments. (See Figure 29) The full group of eligible counterparties, which covers every institution that enters into some kind of a business relationship with the NBH in relation to the central bank's monetary policy transactions, includes the banks, the specialised credit institutions (Hungarian Development Bank, Eximbank, Mortgage Bank, housing savings funds), the primary government paper dealers, savings banks and saving co-operatives, and KELER Rt.

Certain conditions of the given facility may, however, restrict individual counterparties in concluding transactions with the central bank.

For instance, the minimum transaction amount or an increase in the transaction amount or its "tick" may also act as deterrents. Strikingly high requirements appear in the case of quick tenders, when a bank needs to be able not only to make a decision on whether or not to participate in the auction and under what conditions within 30 minutes following the invitation to tender by the NBH, but it must also have adequately rapid data transmission channels and at least Ft500 million per bid.

<i>Figure</i>	The Eligibility of Individual Groups of NBH Counterparties to Enter into Business				
	Reserve requirement	O/N deposit and deposit tender	O/N repo and repo tender	Purchase and sale of NBH bond, government papers	Deposit and repo quick tenders
Banks	X	X	X	X	X
HDB, Exim, Mortgage Bank	X	X	X		
Housing savings banks	X	X	X		
Savings co-operatives, saving banks,	X				
Primary dealers				X	

### *NBH Channels of Communication*

The central bank notifies its counterparties of its decisions through various channels: by mail, facsimile, dailies and Reuters. The principle is that new information should reach those most concerned as quickly as possible.

The central bank notifies those concerned of any changes in its *Terms and Conditions of Business* by fax or mail. Counterparties are required to confirm the amended conditions and it is only thereafter that they may deal with the NBH pursuant to the amended conditions. When a counter-

party fails to sign the contract, it thereby deprives itself of eligibility.

Banks and other concerned credit institutions are notified of changes in interest conditions by way of a faxed circular. Notification concerning changes in business rates is sent to the banks' treasuries, that on changes in the base rate to the CEOs of the banks.

Changes in interest rates, invitations to tender, to buy or sell government papers and the results of tenders and auctions are published in the Reuters pages of the central bank (NBHJ, NBHK) and in daily newspapers. Thus information reaches those directly concerned and financial experts in the most rapid way and at the very same time.



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# ANNEX







# GLOSSARY





*aggregate demand:* the sum of planned consumption, investment and government purchases of goods and services and the net export of goods and services (the difference between export and import);

*aggregate supply:* the total volume of goods and services intended to be sold by producers at a given price level;

*balance of payments:* the total volume of real and financial transactions of a country vis-à-vis the rest of the world. Its most important components are the current account, the capital account and the financial account;

*banknote tax:* a statutory provision to control the money supply. The financial institution authorised to issue money (the bank of issue) had to pay a tax to the state in proportion to the money supply when the money in circulation exceeded the coverage defined by the regulation plus a certain tax-free amount;

*business cycle:* subsequent periods of economic boom and recession (or slow-down in growth) in the course of which the growth rate fluctuates around its long-term trend;

*capital operations:* transactions affecting the capital account of the balance of payments (foreign direct investment, portfolio and other capital flows);

*central bank independence:* the central bank as the organisation responsible for monetary policy must have adequate freedom and independence from personal, financial and professional aspects in taking monetary policy decisions. In most advanced countries legal independence is established by law or statute;

*central bank instruments:* the range of instruments available to a central bank to achieve its objectives. The central bank can influence the level of interbank rates and the amount of the central bank money circulating in the interbank market directly with its instruments. The most important instruments are the open-market (forint and foreign exchange) operations and the reserve requirement;

*conversion on demand:* in the case of monetary systems based on precious metal, the obligation of the central bank to exchange the money substitutes in circulation into monetary precious metal on demand. Although the precious metal does not participate in circulation or only to a limited extent, the characteristics of a classical gold-based monetary system prevail through payment on demand (see gold standard);

*conversion:* conversion of forint to foreign exchange (or the other way round). Conversion by the central bank includes, in addition to foreign exchange market intervention, the foreign exchange-forint conversion related to the foreign exchange operations of the state (debt service, borrowing, privatisation);

*core inflation:* a special inflation indicator which shows changes in inflation net of the impact of the most volatile factors, which are independent of monetary policy (seasonal foodstuff, fuel, pharmaceutical prices);

*coverage system, banknote coverage, currency-banking debate:* in the era when currencies were convertible into precious metals, the amount of banknotes and coins issued was restricted on the basis of the quantity of precious metals held by the bank of issue. Full coverage could not (in general) be implemented, but a specified share of banknotes and coins in circulation had to have adequate precious metal coverage held by the central bank. The central bank could issue money only when it was already in possession of the precious metal coverage. The coverage of additional cash in money circulation was 'bank-type coverage', generally the discounting of good-quality commercial bonds;

*credibility:* the extent to which market agents trust that economic policy decision-makers will react to various economic events in accordance with their declared principles. For instance, a credible central bank which sets price stability as its goal, should respond with more restrictive monetary policy to signs of growing inflation;

*currency basket*: in a fixed exchange rate regimes the domestic currency is fixed against either a single currency or a composite of currencies. In the latter case, the central bank keeps the weighted average exchange rate of the domestic currency relative to several different currencies at a designated level. The set of these currencies and the corresponding weights make up the currency basket;

*current account, deficit*: the balance of trade in goods and services (exports minus imports), current transfers and income transfers vis-à-vis non-residents;

*current payment operations*: transactions affecting the current account (trade transfers, income transfers vis-à-vis non-residents, transfers);

*denomination*: the currency of financial claims and debts. Settlement is to be effected in the currency of the denomination upon the due date;

*deposit insurance fund*: the fund provides security to deposit holders in the event of the insolvency of a bank. Compensation is available on registered deposits up to the insured amount (according to current Hungarian regulation up to Ft 1 million);

*discount factor*: a conversion ratio at which cash-flow items at different points of time exchange hands;

*discount rate*: the interest rate used in the calculation of the discount factor;

*discount treasury bill*: a debt security. A special form of government paper generally of a maturity of less than one year, which does not pay interest. It is sold at a price below its face value and repays the face value upon maturity. It is issued by the Treasury with maturities of 3, 6 and 12 months;

*disinflation*: reduction or decline of inflation;

*duration*: the average maturity of a cash-flow stream (for instance, interest payments and redemption of a bond) weighted with the present value of the cash-flow items. Its magnitude reflects the sensitivity of the price of the given financial asset to changes in market yields. The higher the

duration of a financial asset, the more sensitive its price to shifts in the yield level;

*exchange rate risk*: the risk on foreign exchange denominated financial assets arising from the fact that the value of the asset expressed in terms of domestic currency changes with a shift in the exchange rate;

*expansionary monetary policy*: a monetary policy resulting in the expansion of aggregate demand (faster growth in the money supply, lower real interest rates or depreciating exchange rate);

*fixed or floating exchange rate regime*: in a fixed exchange rate regime, the central bank undertakes the obligation to keep the exchange rate of the domestic currency relative to a given currency or currency basket on a predetermined path with the help of foreign exchange market interventions. In the case of a floating exchange rate regime, the central bank has no target with respect to the level of the exchange rate, which thus may freely move depending on the demand and supply conditions of the market. The type of the exchange rate regime fundamentally determines the way monetary policy can be conducted;

*foreign exchange deposit swap*: a central bank instrument, which provides long-term forint financing to commercial banks against the placement of a foreign exchange deposit with the central bank. The NBH terminated its use in March 1998;

*foreign exchange market intervention*: see 'intervention'

*forward interest parity*: a function describing the relationship between spot and forward rates: it expresses that the total yield on subsequent short-term forward investments (to be launched in the future) must equal the yield on a spot long-term investment of corresponding maturity;

*forward rate*: the interest rate on investments starting at a future date. For instance, the 6-month forward rate beginning in one year's time is the expected interest rate on a 6-month investment starting after one year. In other words, the forward rate is the interest rate for a future period of time (in the previous example, for the period of

starting at one year's time and ending in one and half year's of time from now on). The forward interest parity establishes the relationship between spot and forward yields;

*forward transaction*: a transaction where the purchase or sale is carried out at a predetermined price at a specified future date (see prompt transaction);

*founders' resolution*: its scope may extend to the election and recall of the elected members of the Board of Directors, determining the remuneration of the President, the Vice President and the members of the Central Bank Council, the Board of Directors and the Supervisory Board; and to the alienation of a stake in a business organisation to be regarded as non-resident according to foreign exchange regulations. In addition, the General Meeting determines and amends the Articles of Association, determines the equity and reserve capital, the balance sheet, the statement of net assets, the income statement and the distribution of profits. The General Meeting also approves the statutes of the Supervisory Board;

*gearing ratio*: the ratio of the internal and external liabilities of a business;

*gold standard*: a monetary system in which the value of the currency of a country is equal to a fixed quantity of gold determined by law and the domestic currency appears in the form of banknotes which can be converted into gold at a specified rate. This system provides that the exchange rate remains fixed within narrow limits against other gold-based currencies;

*hyperinflation*: extremely high inflation. Generally, the term is used to characterise a rise in the price level in excess of 50% a month. Money does not fulfil or only partially fulfils its traditional functions (legal tender, form of savings);

*implied forward yields*: (implied) forward yields calculated from the spot yield curve according to the forward interest rate parity;

*indexation*: linking the value of financial claims, prices or wages to some domestic price index or exchange rate;

*indicators*: economic and financial variables, which provide preliminary information on the state of the economy and the evolution of fundamental variables;

*inflation expectation*: inflation expected for a future point in time or period;

*inflation targeting*: a monetary policy framework in which the central bank explicitly declares its targets concerning the evolution of inflation in the future and undertakes an obligation to meet those targets;

*inflation*: continuous and sustained rise in the general price level of goods and services;

*interbank market*: a segment of the money market; the market of central bank funds, where banks are the participants. Transactions concluded in the interbank market are usually very short-term; the vast majority of transactions are o/n transactions;

*interest rate corridor*: the corridor marked by the central bank's O/N (overnight, one-day) repo and/or deposit rates; restrains movements of overnight interbank rates. Central banks use it in order to blunt the undesirably large fluctuation of short-term rates;

*interest rate premium*: the part of the yield on domestic currency denominated investments in excess of the foreign yield and the expected devaluation in the exchange rate. Investors demand higher yield when investing into forint assets compared to dollar or euro investments to compensate for the higher risk involved. This difference in demanded nominal yields corresponds to the interest premium;

*interest transmission*: see: 'monetary transmission mechanism';

*intermediate target*: a variable which has a clear-cut influence on the ultimate goal of monetary policy, and at the same time which is under the control of the central bank. Intermediate target may be a monetary aggregate (money or credit), nominal exchange rate or even the central bank's inflation forecast;

*internal rate of return (IRR)*: the rate at which the present value of an investment is equal with its market value (its price);

*intervention*: central bank intervention on the foreign exchange market. The central bank influences the exchange rate of the domestic currency by buying or selling foreign exchange on the market. As a result of the intervention, the amount of central bank money in the economy changes (declining with the sale of foreign exchange and growing with its purchase); the effect of that can be offset by sterilised intervention (see 'sterilised intervention');

*issue*: issuance of money (banknotes and coins);

*lender of last resort*: the central bank. To safeguard the stability of the financial sector (in particular the banking sector), the central bank undertakes an implicit obligation to protect bank clients and provides banks in difficulties with sufficient liquidity (central bank money) in order to avoid the bank's collapse. When this obligation is obvious, a moral hazard situation may arise;

*limping gold standard*: in the case of the Hungarian *aranykorona* (gold crown) introduced in 1892 some of the specific features of the classical gold standard were missing, therefore, it was referred to as the limping gold standard. Monometallism was not enforced, which means that, apart from gold, the silver coins minted earlier were also accepted as legal tender and the stock of silver was also included in the coverage. Payment on demand, that is, the mandatory conversion of banknotes into gold, was also not implemented and government papers lacking coverage also remained in circulation;

*liquid asset*: an asset which can be converted into cash quickly and at low cost (including exchange rate loss);

*liquidity constraint*: the maximum amount of domestic and external liabilities that may be used by an economic agent. For instance, we speak about a household under liquidity constraint when, in the absence of the possibility of borrowing, its consumption or investment decisions are

determined by its current income position and not its income flow expected over a longer time horizon;

*liquidity management*: in a broader sense, the activity of financial and non-financial enterprises in the course of which they ensure the liquid assets required for administering their business at the least possible cost. In a stricter sense, the activity of the commercial banks in the course of which they provide the liquid assets required for the transactions of their clients and the reserve requirement regulated by the central bank at the least possible cost;

*liquidity situation, liquidity management of the central bank*: the relationship between the actual and desirable level of bank reserves. There is a liquidity shortage when the desired level is higher than the actual and the banks have to turn to the central bank for credit. Liquidity management is the money market activity of the central bank; it shapes the demand for or supply of central bank money so as to align them with the central bank's operating target, be that a quantitative or an interest rate target;

*monetary authority*: the institution having a monopoly in issuing money (banknotes and coins), characteristically the bank of issue or the central bank;

*monetary base (M0)*: the narrowest monetary aggregate, which contains cash and the commercial banks' balance of the forint accounts at the central bank. The central bank has a direct influence on the volume of the monetary base. The monetary base is also referred to as central bank money, base money or high-powered money;

*monetary conditions*: variables describing the stance (expansionary, restrictive) of monetary policy; generally the real interest rate and the real exchange rate;

*monetary transmission mechanism*: the chain of effects in the course of which changes in central bank instruments (policy rate) influence the consumption and investment decisions of the private sector, and thereby ultimately the central bank's main goal (inflation);

*money illusion*: this term is used to describe the phenomenon when economic agents are unable to distinguish nominal and real changes. Owing to the money illusion, an increase in the money supply can, for a transitory period, increase aggregate demand; in the longer term, however, money illusion fades out and growth in the money supply results in inflation;

*money multiplier, money multiplication*: the money multiplier is the quotient of a monetary aggregate (M1 or M3) and the monetary base (otherwise central bank money). Money multiplication is the process in the course of which a unit expansion in the monetary base increases the broader monetary aggregate by a multiple—precisely the value of the money multiplier—as a result of the lending and money creating activities of commercial banks;

*moral hazard*: arises when certain agents of the economy can fully retain the profits of their activities, and at the same time are able to shift their potential losses onto others at least in part. Such situations generally lead to excessive risk-taking. In relation to the banking sector, it arises when banks can be certain that the government or the central bank would bail them out in an eventual crisis, therefore motivated by potentially large profits, pursue a lending practice which involves risks higher than the prudential level;

*moral suasion*: using its authority, the central bank may persuade banks to alter their behaviour informally (through bilateral discussions, written warnings, etc.);

*net financing capacity*: the final balance of transactions in a given period linked to the claims and debts of a given sector. For instance, the net financing capacity of a household is that part of its income which is not spent on consumption and investment, and thus is available to finance other sectors of the economy;

*net present value*: the difference between the present value and the current market price. An investment is worth implementing when its net present value is positive, that is, if it can be bought or imple-

mented at a market price lower than its present value;

*nominal anchor*: nominal macroeconomic variables (e.g. exchange rate, wages, money supply) directly targeted by an economic policy, which aims at stabilisation, the planned development of which serves as guidance or reference for setting other nominal prices. Through this it helps in ‘anchoring’ inflation and inflation expectations. The nominal anchor generally coincides with the intermediate target variable of monetary policy;

*nominal variables*: variables, which reflect changes in both prices (inflation) and volume;

*one-tier banking system*: the central bank responsible for monetary policy has a direct lending relationship with companies and a wide range of the public;

*open foreign exchange position*: a foreign exchange position is open when the sum of the foreign exchange assets and forward foreign exchange claims of a credit institution in a currency does not correspond to the sum of its foreign exchange liabilities and forward foreign exchange debts. The total open position of a credit institution is the sum total of its (long and short) positions outstanding in the various foreign currencies expressed in domestic currency terms. The open position according to the balance sheet is the sum of the net open positions calculated on the basis of the foreign exchange assets and liabilities presented in the balance sheet of a credit institution;

*open-market operations*: the activity of the central bank in the course of which it sells or buys securities (primarily government bonds) in order to influence the amount of central bank money or the interest rate level;

*operating target*: a variable on which the central bank is able to exert an effect directly and immediately and whose change influences the intermediate target of monetary policy. Most frequently it is some kind of short-term money market yield;

*outright operation*: a transaction of purchase and sale where the asset constitut-

ing the subject of the purchase and sale (security, foreign exchange) changes hands for good (see repo);

*overnight (O N rate)*: the rate on (characteristically interbank) placements or credits maturing in one day, that is, starting today and maturing tomorrow;

*payment and clearing system*: the set of instruments, agreements, organisations and institutions engaged in the intermediation and settlement of payments; it enables the administration of payments and the exchange of the various assets in the financial markets (securities and foreign exchange transactions);

*policy instrument*: the instrument applied by the central bank to set the interest rate deemed to be optimal for the state of the economy. Using it, the central bank intends to exert a direct and effective impact on the money market yields and subsequently on the interest rates charged by banks to their customers;

*policy rate*: the interest rate which best reflects the stance of monetary policy. This is usually the interest rate set on the central bank's main policy instrument;

*premium (lending risk, liquidity premium)*: the surplus yield on a given asset relative to the yield on a risk-free asset, which investors expect to compensate them for the various (political, counterparty, liquidity, etc.) risks of the given asset. The expected (*ex ante*) and actually realised (*ex post*) yield may differ;

*present value*: the value of future cash-flows today;

*price stability*: an economic environment characterised by a stable price level or very low (0-2 per cent) inflation, so that inflation is not a factor in the consumption and investment decisions of economic agents;

*primary market*: the market for issuing securities for the first time;

*prompt transaction*: a foreign exchange or security transaction where settlement is simultaneous with the conclusion of the contract (see also 'forward transaction');

*prudential regulation*: regulation by the supervisory authority which curtails the

assumption of excessive risk by credit institutions (for instance, the limits on capital adequacy and large credits). By complying with prudential rules, the credit institution must maintain its immediate and continuous creditworthiness (that is, its liquidity and solvency);

*real exchange rate*: the quotient of the exchange rate and the ratio of the domestic price level to the foreign price level. This is an indicator of the competitiveness of an economy as it presents the value of foreign goods expressed in terms of domestic goods. An appreciation of the real exchange rate implies monetary conditions becoming more stringent, a deterioration in competitiveness and a reduction in aggregate demand and inflation, while devaluation means easing of monetary conditions, which generally has the effect of improving competitiveness but also of raising the price level. Monetary policy is able to influence the development of the real exchange rate only in the short term;

*real interest rate*: the part of nominal rates in excess of expected inflation. The level of the real interest rate has an impact on consumption, savings and investment decisions and thereby on aggregate demand and inflation. By influencing the level of the real interest rate in the economy the monetary policy aims to influence its intermediate targets.

*real variables*: variables net of price changes reflecting the volume effect only;

*real-time gross settlement system*: a gross payment system (which performs clearing and settlement at the same time) in which the processing of payment orders and their final settlement take place continuously with the immediate notification of the concerned participants in contrast to the net system (where the moment of settlement and of clearing are separated in time) or the gross systems with delayed settlement (such is, for instance, the interbank clearing system earlier referred to as the giro);

*redemption yield*: see 'internal rate of return';

*refinancing credit*: forint credit extended by the central bank to commercial banks in order that they onlend them to business organisations (under specified programmes);

*repo transaction*: security repurchase agreement. A combination of two purchase and sale transactions of opposite directions, where an asset (generally a government paper) exchanges hands in the present and at the same time a reverse future transaction is also concluded for a pre-specified date and price. Its purpose is to extend a short-term credit or to place a short-term deposit;

*repo*: security repurchase agreement where one party (e.g. the central bank) buys securities (generally government papers) and sells them forward to the other party (a bank) from whom it had bought them at a date and price specified upon conclusion of the transaction. The repo may be interpreted as lending against collateral of securities (see also reverse repo; repo transaction);

*reserve requirement (ratio)*: commercial banks must hold a portion of their deposits and other liabilities as reserves at the central bank, the portion is determined by the reserve ratio. Raising the reserve ratio decreases, reducing it increases the money supply in the economy;

*restrictive monetary policy*: a monetary policy which results in a decline in aggregate demand (slower increase in the money supply, higher real interest rates or more appreciated exchange rate);

*reverse repo*: a security repurchase agreement, where one party (e.g. the central bank) sells securities (generally government papers) and repurchases them at a future date and price specified upon concluding the transaction. A reverse repo conducted by the central bank can be interpreted as an acceptance of a deposit, in the course of which the central bank withdraws liquidity from the banking sector (see also repo);

*secondary market*: the market for the purchase and sale of securities issued earlier;

*shock*: an external effect reaching the economy, which displaces macroeconomic variables from the equilibrium courses;

*short- or long-term*: relative terms. In financial terminology, short-term is shorter than one year, long-term is longer than one year. In economics, short-term refers to a time interval within which the supply side of the economy is able to respond to demand effects only partially, because a part of the factors of production are given, while in the long term, all production factors may adjust;

*small, open economy*: economic theory regards a country small when it is in a price taker position in its export and import markets. The measure of openness is the extent of the country's economic relations with non-residents, i.e. its foreign trade; characteristically, it is defined by the share of the sum of export and import in GDP;

*spot transaction*: see 'prompt transaction'

*sterilisation*: all the central bank operations, the purpose of which is to offset the effect of foreign exchange market intervention on the domestic money supply. For instance, by increasing the central bank stock of deposits or bonds to an extent identical with that of the foreign exchange market intervention;

*sterilised intervention*: a harmonised series of central bank operations, in the course of which the central bank intervenes in the foreign exchange market to maintain the exchange rate target and at the same time offsets the liquidity impact of intervention with open-market or other operations;

*supervision by the central bank*: supervision of compliance with reporting obligations and provisions of certain legal regulations (for instance, central bank ordinances);

*sustainable inflation reduction*: a term used by the NBH to describe its objective function. The ultimate goal of reducing inflation is constrained by the need to maintain external equilibrium;

*swap transaction*: a purchase and sale agreement, pursuant to which the contracting parties swap future cash-flows under

conditions specified in advance. In a foreign exchange swap transaction, the contracting parties contract to exchange cash-flows specified in different currencies. Swap transactions (beside futures and options) are the fundamental instruments of risk management;

*time inconsistency*: a term used to describe all or certain parts of economic policy. Time inconsistency is mentioned when an economic policy, which is optimal at present, is expected to be sub-optimal in the future and thereby the government feels tempted to deviate from its declared policies. The most characteristic example is when following wage negotiations the government, which aims at curbing inflation, makes measures that lead to higher than expected inflation with a goal to achieve higher growth or better external equilibrium;

*tradable goods*: goods and services actually or potentially participating in foreign trade;

*transmission lag*: the time necessary for a monetary policy measure to reach its full impact;

*transparency*: transparency of the operation of the central bank as perceived by

the agents of the economy. Transparent operation contributes to the establishment and maintenance of a credible monetary policy;

*two-tier banking system*: the bank of issue responsible for monetary policy is in direct relationship only with banks and other financial firms (eligible counter-parties). These counter-parties mediate the monetary policy measures to the companies and a wide range of the public;

*yield curve*: yields (interest rates) plotted against maturity; yields represented as a function of maturity. Central banks most frequently calculate the yield curve from government securities market data;

*zero-coupon yield*: the yield (discount rate) at which a zero-coupon security can be issued under the given market conditions. Zero-coupon assets repay their face value in a single amount at maturity. Zero-coupon yields can also be calculated from financial assets, which pay interest and principal separately. When the cash-flow stream from a financial asset is discounted with the corresponding zero-coupon yield, the sum of the present value of the cash-flow items (that is the present value of the asset) will be equal to the market price of the asset.



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