BANK OF FINLAND
DISCUSSION PAPERS

25 • 2001

Tapio Korhonen
Economics Department
3.12.2001

Finnish monetary and foreign exchange policy and the changeover to the euro

Suomen Pankin keskustelualoitteita
Finlands Banks diskussionsunderlag

Suomen Pankki
Bank of Finland
P.O.Box 160
FIN-00101 HELSINKI
Finland
☎ + 358 9 1831

http://www.bof.fi

BANK OF FINLAND DISCUSSION PAPERS

25 • 2001

Tapio Korhonen
Economics Department

3.12.2001

Finnish monetary and foreign exchange policy and the changeover to the euro

The views expressed are those of the author and do not necessarily reflect the views of the Bank of Finland.

This paper is Finland's part of a study undertaken under the aegis of the European System on Central Banks on experiences regarding the changeover to the single currency. The study is intended to provide useful information to EU applicant countries.

Suomen Pankin keskustelualoitteita
Finlands Banks diskussionsunderlag

http://www.bof.fi

ISBN 951-686-757-X
ISSN 0785-3572
(print)

ISBN 951-686-758-8
ISSN 1456-6184
(online)

Suomen Pankin monistuskeskus
Helsinki 2001

Finnish monetary and foreign exchange policy and the changeover to the euro

Bank of Finland Discussion Papers 25/2001

Tapio Korhonen
Economics Department

Abstract

This paper presents the salient aspects of Finland's monetary and exchange rate policies during the run-up to monetary union in the 1990s. In the course of slightly more than a decade, Finland's monetary and exchange rate policies were thoroughly revamped. The remnants of heavy regulation were removed and a market-based financial system was put in place. There were serious problems associated with the liberalisation process in the early part of the decade, the most noteworthy being an economic and banking crisis. Finland's financial system nonetheless developed rapidly and became a more integrated part of the global system. As regards exchange rate policy, almost all varieties of exchange rate regime were tried. A fixed rate regime based on a currency index fell apart in the early part of the decade and was replaced by a floating rate system. Later, in 1993, this was combined with an inflation-targeting monetary policy strategy. At the start of 1995 Finland joined the European Union, and in October 1996 the markka was joined to the EU's Exchange Rate Mechanism. The improvement in financial and price stability that followed the economic crisis facilitated the adjustment to the euro area's single currency and single monetary policy at the start of 1999, which was accomplished without serious problems.

Key words: monetary policy, foreign exchange policy, EMU, euro, monetary policy arrangements

Suomen raha- ja valuuttapolitiikka euroon siirryttäessä

Suomen Pankin keskustelualoitteita 25/2001

Tapio Korhonen
Kansantalousosasto

Tiivistelmä

Selvityksessä käydään läpi pääpiirteittäin Suomen raha- ja valuuttapolitiikka 1990-luvulla rahaliittoon valmistauduttaessa. Runsaassa kymmenessä vuodessa Suomen raha- ja valuuttamarkkinat muutuivat merkittävästi. Säännöstelyn jäänteet poistettiin ja Suomeen luotiin markkinapohjainen rahoitusjärjestelmä. Liberalisointiin liittyi vuosikymmenen alussa suuria vaikeuksia, erityisesti vakava talous- ja pankkikriisi. Samalla Suomen rahoitusjärjestelmä kuitenkin kehittyi voimakkaasti ja kansainvälistyi. Valuuttapolitiikassa sovellettiin lähes kaikkia valuuttakurssijärjestelmiä. Valuuttakoriin perustunut markan kiinteä kurssi murtui vuosikymmenen alussa, ja vuonna 1993 kelluvan kurssin oloissa omaksuttiin inflaatiotavoitteeseen perustuva rahapolitiikan strategia. Vuoden 1995 alusta Suomi liittyi Euroopan unioniin, ja lokakuussa 1996 markka kiinnitettiin EU:n valuuttakurssimekanismiin ERMiin. Talouskriisiä seurannut rahoitus- ja hintatasapainon paraneminen myötävaikutti siihen, että sopeutuminen euroalueen yhteiseen rahaan ja rahapolitiikkaan vuoden 1999 alusta sujui ilman merkittäviä ongelmia.

Asiasanat: rahapolitiikka, valuuttapoliiikka, EMU, euro, rahapolitiikan välineet

Tämä keskustelualoite on saatavissa suomenkielisenä Suomen Pankin kansantalousosaston työpapereissa.

Contents

1 Finnish economy already adjusted to integration pre-1990s

When the heads of the various European Community's states agreed on the gradual transition to Economic and Monetary Union (EMU), in Maastricht on 10 December1991 (signed 7 Feb 1992), the project was not immediately seen as something that would directly affect Finland. Finland's membership of the European Union seemed a distant possibility and the realisation of the single currency concept within the proposed timeframe was generally regarded with scepticism both in Finland and elsewhere. According to the Maastricht Treaty, detailed preparations for EMU were to begin with Stage Two, at the start of 1994, with the establishment of the European Monetary Institute (EMI) precursor of the European Central Bank (ECB). Transition to Stage Three – a single currency and a single monetary policy – was to happen by 1 January 1999 at the latest.

Finland had already participated in Western Europe's integration process for decades, both politically and by opening up its markets. With the exception of key agricultural goods, Finland's foreign trade had already been liberalised with the dismantling of controls in the 1950s. Finland was very much involved in Western European economic organisations, despite some constraints imposed by its foreign policy of that period. Finland had already become a member of OECD (1969) and EFTA (1961, with full membership in 1986). In 1972 there had been negotiations with the European Community on a free trade agreement, and at that time, in 1991, cooperation centred on negotiations on the establishment of the European Economic Area (EEA). The EEA agreement was finally signed on 2 May1992 and came into force at the start of 1994, meaning that from this time on most EU regulations also concerned Finland.

The Finnish economy had already become highly integrated with the international economy, although most of the larger companies were still operating primarily in Finland. Finnish industry developed a competitive edge, particularly in the forestry sector and metal and engineering industries, and these, in turn, were able to engage extensively in foreign trade. The concentration of this foreign trade was centred on Western Europe, Sweden, Britain and Germany; albeit business with the Soviet Union also became so significant that it accounted for somewhere around a fifth of all foreign trade.

Finland's economy was typical of the Nordic countries, with the central government playing a relatively large role, even though tax levels were not quite as high as in Denmark and Sweden. State-owned companies were major players in several basic industries, while still operating according to the demands of the market. Productivity rose faster in Finland than in Western Europe on average, virtually closing the economic gap in standards of living that had appeared after the war. Productivity levels were achieved at the cost of very high investment levels (25–30% of GNP) and hence return on investment could be considered fairly low.

In terms of the real economy, Finland's overall preparedness for integration was fairly good. The monetary and inflation requirements posed more serious problems. Inflation and nominal income had risen almost continually faster than in the competitor countries. The significance of the labour unions was crucial. Wage levels were agreed to in the context of extensive nationally binding collective agreements under which public authorities were often bound to take certain measures, which could even include policy decisions on interest rates. Limited pricing regulation was introduced, affecting agricultural products, rents and other politically sensitive areas.

Financial market regulations had been in place in Finland for the entire postwar period, broadly affecting the financing of both businesses and households. However, at about the time of the signing of the Maastricht Treaty, the dismantling of control provisions concerning overseas borrowing and foreign exchange activities was completed. Although a step behind the others, Finland followed the rest of Western Europe, and Sweden in particular, along the path to greater liberalisation.

No quantitative controls had been placed on domestic financing in Finland – despite the fact that the Bank of Finland had issued instructions concerning bank lending – although market interest rates were broadly based on an administrative rate – the base rate. The Bank of Finland – in effect the Bank's Parliamentary Supervisory Council, whose members are chosen by Parliament – set the base rate. Changes in the base rate were followed by changes in banks' deposit and loan rates, including interest rates on outstanding contracts. This interest rate linkage was based more on tax policy than on specific mandates.

The Bank of Finland liberalised the interest rate system, as regards the banks, in 1986, after which banks' lending and deposit rates quickly became more market oriented. The Bank of Finland's arrangements for regulating bank liquidity had been revised often, but by the end of the 1980s a market-oriented approach had been adopted. The Bank's previous arrangement of special loans to assist, inter alia, export firms was dismantled.

The last of the foreign exchange controls were rescinded in 1991, after almost a decade of gradual liberalisation. Perhaps the most significant change came with the granting of permission in 1986–1987 to raise long-term loans from abroad. The biggest fundamental change occurred at the start of 1991, when the old comprehensive restriction was finally repealed; from then on, all foreign exchange dealings not specifically subject to approval by the Bank of Finland were unrestricted. Now foreign exchange restrictions remained only on the raising of loans abroad by private individuals and comparable corporate entities, and these were in turn lifted in October 1991 in accord with the spirit of the EEA Agreement. From the start of 1991 foreign banks were allowed to establish branches in Finland; subsidiaries had been allowed earlier. Previously, particularly restrictive regulations concerning the limitation of foreign ownership of Finnish enterprises were abolished in the early 1990s.

In the postwar years, exchange rate regime was one of fixed exchange rates. The markka had been pegged to the US dollar up until the early 1970s, after which the Bank of Finland began to fix the markka's external value according to a trade-weighted currency index, which was occasionally adjusted. The permitted fluctuation limits were at various times 4.5% or 6%, and in the final phase of the fixed exchange rate regime, in November 1988, the limits fluctuated were wider, ie 3% on both sides of the central rate. In practice, the exchange rate generally remained (or was kept) fairly steady within the band.

Because Finland's inflation rate almost continually exceeded that of its trading partners (albeit modestly, as Finnish inflation was only slightly higher than the average for Europe), the markka had to be devalued at roughly ten-year intervals, by 10–30%. There was talk of a 'devaluation cycle' spanning two business cycles, during which time Finland would loose its price competitiveness.

On 7 June 1991, the Finnish markka was linked to the EC's official accounting and currency unit, the European Currency Unit (ECU). The ECU-link was not sought after; rather Finland found itself forced by market pressures to mimic Norway (18 Oct 1990) and Sweden (17 May 1991). The move aroused intense interest despite its modest economic impact, as ECU countries accounted for over 85% of the trade-weighted index. All of the European currencies were now linked, admittedly via differing mechanisms, and were in practice 'pegged' to the Deutschemark, which served to anchor the system. Almost all of the EU membercounties' currencies were included in the European Monetary System (EMS), of which the Exchange Rate Mechanism (ERM) was the key element.

2 Backdrop for EU membership and monetary union – the deep economic and banking crisis of the 1990s

At the time of the Maastricht Treaty, Finland was faced with a deepening recession, in fact in historical terms this was an exceptionally deep recession for a western nation (Charts 1 and 2). Its roots could be partly found in the domestic economy, mainly in long-standing excessive demand, inflated costs and heavy debt loads borne by many companies at the time. Another causal factor was external: export trade to the Soviet Union plummeted to a fraction of its previous level as the Soviet Union disintegrated. In addition, there was a depression within the international forestry industry and high interest rates brought about by the integration of the East and West Germany. Exports and investment collapsed. Finland's total output dropped by 7% in 1991 and continued to fall the following year. Unemployment rose steeply and the central government slipped into a pronounced cycle of indebtedness. The government fiscal deficit (excl. the surplus of employment pension schemes) rose as high as 6% of GDP in 1991 and 9% the following year, despite severe cuts in many government expenditure items.

Fiscal policy matters aroused intense discussion. The large deficit had a stimulative effect on the economy, but there was a danger that financing could dry up. In February 1992, the Government drafted a medium term plan for 1993–1995, according to which the expenditure increase for the period 1992–1993 would be followed by a return to the 1991 level by the end of the plan period. As interest payments grew, other expenditures had to be reduced. The Government implemented a broad scheme of structural reform, affecting, inter alia, the tax system and competition policy. There was a harmonisation of capital income taxation to the 25% level (a level that was gradually increased later), the tax base for the value added tax (VAT) was broadened and projected pension spending was substantially scaled back.

Immediately before the November 1991 Maastricht meeting, the markka came under speculative pressure – followed by a day of floating – and it became necessary to devalue the markka by slightly more than 12% (effected via a 14% increase in its fluctuation range vs the ECU) (Chart 3). Conditions in the foreign exchange market remained turbulent after the devaluation. There were also serious problems in the financial markets. Despite the recession, Finland's interest rates had to be kept at a high level (over 10%) due to pressures from the foreign exchange market. The one-month Helibor rates touched over 20% in autumn 1991 and again in spring 1992, under the pressure of devaluation speculation, and rose to similar levels yet again at the end of summer 1992 (Charts 6 and 7).

With the economic crisis came a severe banking crisis, as many private companies succumbed to debt burdens and households, having borrowed heavily in an overheated housing market, encountered financial problems. The situation was exacerbated by the devaluationrelated increase in the markka-value of a sizeable foreign currency-denominated debt. With domestic interest rates at a high level, even investments in the domestic economy could be financed with 'cheap' foreign loans – on the assumption that the fixed exchange rate would hold (Charts 8 and 9).

There were many factors behind the banking crisis. While these were primarily associated with above-mentioned problems in the real economy, a lack of preparedness for financial deregulation on the part of market participants exacerbated the situation. This was the case despite the fact that banks and companies had generally been calling for liberalisation. Under the old system of controls, there had been an accumulation of pent-up demand for credit, which was suddenly released with the deregulation of the market. Moreover, borrowers not prepared for the possibility of high market rates. A tax system that favoured borrowers was not reformed before the crisis hit, and the housing market in particular had become seriously overheated.

On the other hand, the regulatory system had underwritten banks' profitability by ensuring an adequate interest rate margin and de facto 'managing' the bulk of loan losses. This was achieved via regulation of average lending rates that allowed banks to apply zero interest rates to non-performing loans while inflation eroded the debt principal. The changeover to a market-oriented situation removed the advantages that had saved the banks in earlier, albeit milder, crises – mainly at depositors' expense. In the new situation loan losses exploded, reaching 5% of GNP in 1992. As a percentage of total lending, loan losses for some of the local banks rose into the tens.

It is to be noted, however, that domestic households were on the whole not heavily indebted by international standards. Finnish companies that exported a great deal were able to survive their debts thanks largely to the effects of devaluation, while many heavily indebted companies that depended on the domestic markets failed, even though were otherwise healthy. The extraordinary depth of the economic recession was clearly the main reason for the debt crisis. Credit market participants had simply not been able to prepare for the realisation of such huge risks.

The Bank of Finland has been widely blamed for the too rapid deregulation and poor timing prior to economic overheating and the recession that followed. In retrospect, the criticism may be fair, albeit when the decisions were made the course of developments could not be foreseen. In 1986, when deregulation was perhaps in its crucial phase, economic growth and the outlook were fairly weak. Looking back, one can readily argue that deregulation should have been carried out earlier. There has also been heavy criticism of Finland's holding tightly, all the way up to 1991, to a fixed foreign exchange rate that was almost 20% overvalued, in real terms, based on its average over the previous several decades (Chart 4).

The roots of the problems stretched back to the 1980s. There were serious problems in the late 1980s concerning appropriate monetary and foreign exchange policies for restraining a surprisingly strong economic boom. The driving force behind the boom was strong demand for Finnish exports, and other factors included a dramatic improvement in the terms of trade due to a drop in oil prices, but clearly fiscal and monetary policies had been too loose.

The freeing of capital flows began to have a pronounced effect on monetary policy. Attempts at monetary tightening failed as foreign capital streamed into Finland, which also increased exchange rate risks for the private sector. The fact that the monetary policy had lost its effectiveness in the context of a fixed exchange rate was perhaps not fully acknowledged, even at the Bank of Finland, not to mention the question of whether the public would understand the shift of responsibility to fiscal and incomes policies.

The banks' central bank financing system was established at the start of 1986, with the differentiation between call money credit and deposit rates, both set by the Bank of Finland. The system was upgraded several times; for example from the start of 1989 a bank's call money credit rate was doubled if the five-day moving average of the bank's daily position was negative. The aim of the change was to induce a more market driven change in the level of interest rates especially in situations of currency speculation, the reason being that it had often seemed that sudden interest rate decisions by the Bank of Finland and news headlines that followed only to worsened the crisis. The system was reformed – again in the middle of a crisis – to increase its flexibility.

In addition to interest rate policy, the Bank of Finland tried other measures. In March 1989, it effected monetary tightening via a new cash reserve agreement, effective until year-end, under which banks' costs were linked to the attainment of targeted growth for bank lending. In addition, the markka was moderately revalued, by about 4%. This reduced the inflationary impact of foreign trade prices and represented an attempt to increase exchange rate uncertainty so as to reduce capital imports and thus boost domestic interest rates.

Revaluation was followed by a sharp deterioration in the economic outlook in 1990–1991 and expectations of an offsetting devaluation. But capital flows were now completely unrestricted, and the feeling at the Bank of Finland was that a small devaluation would be impossible to control, as it would only add to exchange rate pressures. A switch to a floating exchange rate regime under these conditions was totally excluded if only for political reasons; the Government was not inclined to turn over to the Bank of Finland the policymaking power inherent in a floating exchange rate. Exchange rate policy was also strongly affected by the above-mentioned European fixed rate environment, and Finland was not willing to be the weak link in the system. Exchange rates were clearly overvalued in many other countries and hence those currencies too came under occasional pressure. Finland's own experiences of devaluation benefits quickly slipping away with inflation also weighed strongly.

In the light of experience, these factors took on disproportionate importance; the fixed rate system soon failed in many other countries, and the inflation pick-up remained subdued in Finland and in the other countries. On the other hand, in ex post assessments the timing of the devaluation was overemphasised; it is not likely that devaluation occurring a year earlier or year later would have had a significant effect on the nature of the economic crisis. Market interest rates declined only slightly after the devaluation, after which they resumed their upward trend.

Apparently the Bank of Finland's mistake was in granting the banks the right to central bank financing on the basis of their own (mostly non-collateralised)

CDs. These private instruments were used in monetary policy operations because the Finnish government had not issued short-term debt paper. The central government in fact had little debt at all (at a minimum, slightly over 10% of GNP), and the Bank of Finland held virtually no government paper. The absence of collateral backing on central bank credit was considered natural during the period of tight regulation, but the tightening of collateral requirements came too late vis-à-vis market liberalisation. Even banks that greatly increased their lending were able to obtain central bank credit too easily. Moreover, the Bank of Finland, in an effort to improve the functionality of the markets, treated the bank paper equally, regardless of the riskiness of the issuer. It was only in 1991 that the banks' financing became largely repo based, again using bank CDs.

In order to monitor banks' risks, a broad statistical system was established in the 1980s. However, it proved to be a mistake to focus on individual banks' risks, ie exchange rate, interest rate, liquidity and other risks. The system proved incapable of warning of clearly more significant risks, ie those of debtors' inability to service their debts during a deep recession.

The savings banks, operating without clear ownership interests, became heavily involved in the main areas of bank lending risk, related eg to the stock market and financing of the real estate bubble, and were virtually wiped out . The bulk of banks' loan losses were accounted for by these banks. The group's central financial institution had to be taken over by the Bank of Finland, and it was later turned over to the Government Guarantee Fund for dismantlement. The branches of the failed savings banks were sold to other banks. On the 23 February 1993, Parliament approved a resolution requiring that the Finnish State guarantee Finnish banks' ability to meet their commitments 'under all circumstances'; otherwise the banks would have found themselves in a deep crisis because of foreign liabilities.

It is estimated that the banking crisis cost Finnish taxpayers the equivalent of some 7–8% of the annual GDP of that time. On the other hand, banking operations that had blow out of proportion during the era of tight regulation underwent rapid rationalisation in the years that followed, eg via staff cuts of 50%. The Finnish banking sector, which had even previously been fairly centralised, became one of Europe's most centralised, and most efficient, banking sectors. In terms eg of technology, settlement systems run by Finnish banks already had a long history of high efficiency as measured by international standards.

3 Run-up to EU membership – markka floated (1992–1994)

An entirely new light was cast on Finland's foreign currency and monetary policies in the early part of 1992, as the Government set its sights on becoming a member of the European Union. An essential part of a successful bid for membership was acceptance of the Maastricht Treaty in full and the implied agreement to join the single currency and single monetary policy. At that time, the idea of a single currency was considered a fuzzy goal for the future, which would not have a direct impact on monetary policy, due to the fact that EU accession negotiations were expected to take a long time.

The Bank of Finland's foreign reserve assets (incl. forward exchange transactions) declined to a very low level as a result of speculative bouts in autumn 1991 and spring 1992. In the summer of 1992, the Bank set up a currency swap arrangement with the European central banks. In autumn 1992, pressure on the Finnish markka became unbearable and the Bank of Finland's foreign exchange position, including support loans, became negative. It became necessary to float the markka on 8 September 1992. The markka's external value fell immediately by another 10%.

The markka was the first European currency to fail with this second devaluation since November 1991. Not long after this the ERM itself fell. Italy and England separated for the time being from the system on 16 September 1992 and floated their currencies. Several ERM members were forced to devalue in autumn 1992 and at the start of 1993. Sweden, at that time an applicant (and hence non-EU) country give way and floated its currency in November 1992. Thus the West European exchange rates were starting to fluctuate again. In August 1993, the EU central bank governors and finance ministers decided to widen the fluctuation ranges for ERM currencies, mostly to ±15%. Despite this, the core EU countries were able to maintain fairly stable mutual exchange rates.

The economic and banking crisis had by that time resulted in a considerable lowering of Finland's international credit rating. Banks' foreign funding was limited to short-term borrowing and spring 1993 saw a further reduction of the central government's credit rating, just as its financing needs were particularly pronounced. On the other hand, the position of export companies had strengthened considerably, having so far enjoyed a devaluation of about 30%, and these companies were able to quickly pay off their foreign loans. After a brief but critical period, the central government's foreign financing sources became more readily accessible, and this fostered high levels of borrowing from abroad in the following years. The foreign currency situation was eased, partly due to foreign investors' increased interest in Finnish shares, which were relatively cheap and could now be purchased freely by foreigners.

Although the international export markets were still weak in 1993, Finland's exports posted robust growth. A current account deficit that had persisted for almost continuously for decades finally disappeared. GDP, after declining by more than 10% over a two to three year period, recorded a slight increase in 1993 and a strong pick-up in 1994. Rapid growth of 4–6% pa continued to the end of the decade. However, for many years demand was strongly biased toward exports while domestic investment and private consumption remained sluggish.

All in all, economic balance was fairly well achieved. There was a strong current account surplus and inflation stayed close to the Bank of Finland's target levels. The general government deficit began to decline significantly. The worst problem (which was much worse than in the 1980s) was unemployment, which remained at double-digit levels at the millennium change despite a modest downward trend. A reduction in unemployment was achieved partly because of government employment programmes.

The markka float was initially viewed as a temporary measure, but it was soon realised that the conditions were not ripe for quickly reestablishing a fixed exchange rate. In fact, on 13 November 1992, the Council of State amended the Currency Act, authorising the Bank of Finland to abandon the limits on the markka's fluctuation range for an unspecified period and letting it float for the time being. Floating caused a great deal of confusion and discussion concerning the roles of the different branches of economic policy. The Bank of Finland was in a new, but at least clearly defined, situation. Its power and responsibility in respect of monetary and foreign exchange policy power had increased. Developments had been closely monitored regarding other small-country currencies that were then floating, eg those of Australia and New Zealand.

The markka floated for about half a year without a clearly defined anchor for monetary policy. In February 1993 the Bank of Finland adopted a new policy of inflation tageting. The aim of monetary policy would be to stabilise inflation at 2% by 1995, (more specifically, CPI inflation, excl. the effects of indirect taxes, grants, housing prices, and interest rates on housing loans). Partly due to the recession and moderate wage agreements, inflation was already close to the desired level. Despite that, the policies were met with a great deal of scepticism, as the public was accustomed to very different levels of inflation. The Government gave its support to the inflation objective and the moderating effect of the recession on pricing and wage demands ensured achievement of these objectives without especially tight monetary policy.

The foreign exchange market was marked by a great deal of uncertainty throughout 1993, and the Bank of Finland smoothed out fluctuations in the exchange rate via fairly large interventions in both directions. The easing of monetary policy could only be done gradually. Nonetheless, interest rates declined over the course of the year, until they were virtually on a par with German rates.

Over time, the markka float proved to be much more stable than anticipated considering that Finland's economy is small and – in terms of foreign trade – fairly narrowly based. During 1994 the Bank of Finland was able to reduce its operations in the foreign exchange market, limiting these to moderation of rapid fluctuations but not acting to affect the underlying trend of the exchange rate. The markka continued on the upward trend that had begun in 1993, moving toward its prefloat level, which helped ensure attainment of the inflation objective. The markka's depreciation had clearly been excessive. It had resulted in undervaluation of the markka, in terms of the trade-weighted index, by as almost as much as the markka had been overvalued prior to the 1991 devaluation.

4 Monetary policy arrangements and market institutions in the 1990s

4.1 Monetary policy arrangements

The monetary policy regime had developed in stages and was already highly market oriented. The key elements were (1) a permanent minimum reserve system, based on bank deposits, which strengthened central bank control over banks and bank liquidity, (2) open market operations, which were the prime means of exercising control over bank liquidity, and (3) the liquidity facility, which ensured that a bank could automatically acquire or invest liquidity on a temporary basis.

The long history of the voluntary cash reserves system ended in 1993 when the Bank of Finland withdrew from the agreement then in effect. The direct reason was that, following a decline in market interest rates, the Bank of Finland faced the possibility of being obliged to pay a higher-than-market interest rate on banks' cash reserves. As an offset to banks' interest earnings, the required reserve ratio had been fairly high.

The new statuary minimum reserve system entered into effect in July 1993. Interest was not paid on reserve deposits, which meant much lower reserve requirements than what the banks were accustomed to. The reserve ratio varied between 1% and 2%, depending on the liquidity of the account. Later, in October 1995, the system was changed so that reserve requirement were met on the basis of monthly averages instead of fixed monthly amounts. This marked a fundamental change in the nature of the system. The old arrangement had served primarily as a means of tying up a certain amount of general liquidity whereas, with the new averaging feature, the system was now an integral part of banks' daily liquidity management. The new feature facilitated banks' payments and reduced the impact of market disturbances on overnight interbank interest rates. The Bank of Finland no longer used the system as a means of tying up liquidity; the required reserve ratio was not adjusted.

Liquidity was controlled via open market operations which, in the early phase of the late 1980s and early 1990s, took the form of direct transactions with banks, largely in bank CDs. These operations were not conducted on a fixed time schedule but rather in accord with current conditions; hence there was no need for 'fine tuning' operations. Because banks generally had ample liquidity, the Bank of Finland also absorbed liquidity by issuing its own CDs, a type of operation that was used frequently over the rest of era of national monetary policy. Bank liquidity in Finland was higher as a result of the small amount of banknotes in circulation. After the currency crisis, the banks' abundant net investments in the central bank became a structural trait of the latter's balance sheet. This situation apparently did not hamper the conduct of interest rate policy.

In July 1992 the Bank of Finland adopted an auction (tender) system, albeit parallel direct dealing continued for a period. For the first couple years, the new system was based on variable-rate tenders, so that the applied interest rates were largely market determined. The banks were required to submit bids to buy or sell one-month money market investments. The 'tender rate' was the weighted average of accepted bids, expressed as an annual interest rate. The operations were usually based on a maturity of one month, albeit occasionally three-month or even one-year maturities were applied.

In December 1994 The Bank of Finland switched to fixed rate (ie quantity) tenders, which underlined the role of the tender rate as the key signalling mechanism of monetary policy. The auctions were still not held according to a fixed time schedule and hence interest rate decisions were surprises to the market. The Bank of Finland wanted to preserve this high degree of discretion in the context of highly uncertain markets. After averaging became a feature of the minimum reserve system, open market operations were needed less frequently.

With the introduction of fixed rate tenders, banks' bids quickly grew to many times their liquidity needs, as they attempted to ensure that they would always get enough liquidity. Starting in March 1996, the Bank of Finland accepted the banks' bids in full, which forced them to gauge their bids realistically. When the operations were conducted at one-month maturity, the Bank of Finland in practice applied the one-month Helibor rate. The overnight rate was allowed to fluctuate freely, since it was viewed as having no significant effect on the economy.

In addition to the minimum reserve system and open market operations, the monetary policy instruments included the liquidity facility, which, as from 3 July 1992, replaced the old call money credit and deposit facility. The new facility's liquidity credit rate and call money deposit rate were defined as margins vs the tender rate. The margins for both were initially 1 percentage point, but these were soon increased. During the latter part of 1992, the margin for the liquidity credit rate was 3 percentage points, and in the following year both margins were set at 2 percentage points, where they remained until the end of the era of national monetary policy.

In connection with the revision of the minimum reserve system in summer 1993, the ‘call money deposit’ concept was replaced by ‘excess reserves’. A bank’s (interest-bearing) excess reserves were equal to the amount by which the average balance on its current account at the Bank of Finland exceeded the required amount. Interest was paid on excess reserves.

The maturity of liquidity credit could vary but was generally one week, as compared to call money credit, which was overnight credit. The revision increased the banks’ interest burden on central bank credit, but it could also have a stabilising effect in the face of speculation. Now there was an upper limit on the interbank one-week lending rate. In autumn 1994 the Bank of Finland began to require full collateralisation of liquidity credit.

With the changeover to averaging in the minimum reserve system in October 1995, the banks’ reserve holdings were switched from fixed-term to current accounts. A bank was obliged to take a liquidity credit whenever its end-of-day balance would otherwise be negative or its average balance for a reserve maintenance period would otherwise be less than the required amount. Due to the addition of reserve deposits to the total supply of liquidity in the money market, there was a substantial increase in the average level of liquidity. Already at this stage, the use of liquidity credit was modest and infrequent.

Overall, the monetary policy instruments were relatively effective and were not changed much during the final years of national monetary policy. Although these instruments generally functioned in a clearcut manner, quite a few small, technical problems arose, eg in connection with calendar effects.

4.2 Intervention in the foreign exchange market

At best, the Bank of Finland’s foreign reserve assets were only slightly above the international average, at about 10% of GDP, which amounted to some 3–4 months worth of imports (Chart 11). Due to frequently occurring pressures, the foreign reserves tended to fall substantially below the Bank’s target level. The Bank pursued an active policy of investing its reserves in several major currencies and various instruments. The US dollar was the most important currency, but the European currencies together accounted for the bulk of the investments. Interventions were conducted directly with domestic banks.

Especially as a means of pegging the exchange rate, but also in the early phase of the float, the Bank conducted relatively large interventions. These were for the most part spot transactions, which affected the Bank‘s balance sheet two days later. The balance sheet was published four times a month with a two-day delay. Since undervaluations of the foreign exchange reserves were very small, spot interventions generally became public knowledge in about two weeks' time.

Often in the face of exchange rate pressures, forward interventions were resorted to in order to cover up the situation. Foreign currency (currency position) could be sold without a visible reduction in foreign reserves until the forward agreements expired several months later. Forward exchange agreements also enabled delay of the effects of currency pressures on liquidity in the domestic money market and hence to an extent performed the task of open market operations. The 'secrecy' aspect of forward agreements was also limited to a very short period of time. On average, forward interventions were made public with the same delay as the monthly balance of payments statistics, ie just over a month after the end of the reporting month. This meant that on average forward interventions were made public with a lag of about two months, by which time conditions had often calmed or changed substantially.

Both domestic and foreign companies used forward exchange agreements often, and in large amounts, for speculative purposes, and these were the primary means of capital flight. The volume was perhaps also affected somewhat by the fact that the forward markets were largely deregulated already at the start of the period of liberalisation in 1980 and hence companies were accustomed to operating in them. One leftover from the era of regulation was that, even after liberalisation, the Bank of Finland continued to collect data on, and to monitor, forward transactions perhaps more closely than was done in any other country. The banks actually reported daily on some aspects of these transactions, in connection with their reporting on foreign exchange risks, and from the reports it was possible to determine the sources of speculation. After the changeover to the float, the need for such analyses receded. Toward the end of the era of national currencies, the volume of trade in foreign exchange options also increased, but these were never closely monitored.

Problems in the currency markets and concerning liquidity management sometimes arose as a result of the old practice by which the central government handled its major currency operations via the Bank of Finland. These currency trades were not counted as foreign exchange market interventions. The Bank followed certain rules in buying currency and selling it at the daily rate to the central government. Thus the central government's (often large-scale) foreign currency operations – usually raising or repaying foreign loans – did not affect the exchange rate but did have major impacts on the amount of foreign reserves and bank liquidity. The central government's foreign currency-denominated debt in fact reached a peak in the mid 1990s and remained excessive in the latter half of the decade, amounting to about a third of GDP.

The distribution – between central government and central bank – of gains and losses on foreign exchange trading was also discussed in periods of widely fluctuating exchange rates, especially when the Bank of Finland's own funds were at a very low level. The foreign exchange reserves were held by the Bank and the debt by the government. Considering all of these factors, however, cooperation between the Ministry of Finance and the Bank functioned well. At least in difficult situations, the Bank was able to affect eg the amount and timing of the central government's foreign borrowing.

Defending the markka via interventions was sometimes costly to the Bank of Finland, which often sold foreign currency to speculators at a lower rate than it was obliged to repurchase it after the markka had depreciated. The banking crisis was also very costly in the early stage, before the central government began to pay the costs. Although the Bank's own funds declined to a very low level, it did not have to rely on government support. The government did in 1996 provide compensation for part of the costs related to the banking crisis. Nor was the Bank able to turn over any earnings to the central government for over a decade. One factor in the Bank's poor financial results was the fact that the amount of banknotes in circulation – which, being interest-free, are a prime source of central bank income – has been extremely low by international standards – perhaps the lowest of all comparable countries. This has been largely due to an extensive bank branch network and efficient payment system. The ratio of banknote value to GDP has been only 2% to 3%.

4.3 Changes in the banking system

The Finnish banking system had functioned in a highly stable manner for decades. Up until the 1990s the banking markets were dominated by five banks/banking groups, consisting of two large commercial banks and the slightly smaller state-owned Postipankki, as well as the large groups of local savings and cooperative banks, each group with its own central financial institution. Local banks had all but disappeared in the crisis of the 1930s; only the Swedish-language area of Åland had its own small commercial bank. In Helsinki there were a few small domestic commercial banks and subsidiaries of foreign banks. Postipankki operated largely in the manner of a commercial bank – partly via the post offices – but was in a special position vis-à-vis central government payments. Thus the government did not hold its assets at the Bank of Finland (nor did the Bank hold government debt). While this arrangement facilitated monitoring of the Bank's own liquidity, it also afforded Postipankki a central position in the money market.

Because the banking system was highly concentrated, it was relatively easy to conduct monetary policy in an informal manner. The legislation concerned only the main features of monetary policy, except for fairly detailed regulations on the fixed exchange rate system. Monetary policy arrangements were based on decisions made by the Bank of Finland, some of which were agreed with the banks. In general, the Bank of Finland's power derived from the banks' commitment to observe the Bank's rules in exchange for access, as needed, to central bank financing.

A legacy of the regulation era was the large number of national features of the financial markets. The markets were highly bank-centred. The securities markets were relatively unimportant, and the bond market remained small because of a low level of central government debt and tight regulation of private issuance in connection with tax exemption. A few fairly small special financial institutions had financed their lending via bond issuance, but even these resorted largely to foreign sources. The stock market long remained quite small by international standards.

The interest rate system and taxation of financial assets had particularly national features. As mentioned above, in connection with the crisis the tax system was made more neutral. This was accomplished largely by narrowing the formerly wide scope of tax exemption of interest earned on deposits and significantly reducing the possibilities for deducting interest expenses on borrowing. Long-term fixed-rate assets were of little significance in the Finnish markets; most bank deposits and bonds were variable-rate instruments. Partly due to efforts by the Bank of Finland, a broad system of reference rates was put in place, which included Libor-type Helibor rates and bank-specific prime rates set by individual banks. The 'long-term' (3 and 5-year) reference rates served primarily as reference rates for housing loans.

The banking crisis, broad internationalisation and gradual preparation for EU integration gave rise to a market-induced and policy-based adaptation of the financial system to a new situation. The Finnish banking system was almost completely revamped in the 1990s. The banking sector became even more highly concentrated. At the start of 1995 the two largest commercial banks were merged into an institution with about 40% market shares in many key sectors. The cooperative banks were left as the second largest banking group. A little later, Postipankki completely discontinued its postal activities and lost its legally mandated status as regards government payments. At the end of the decade the largest bank joined the Nordic banks' merger trend. Swedish banks also stepped up their activities in Finland.

5 The EU-era float prior to joining the ERM

5.1 Maastricht criteria

Finland joined the EU at the start of 1995, along with Sweden and Austria. Referenda on joining were held in autumn 1994, in Finland and then in Sweden. Uncertainty about the outcome caused a rise in interest rates and a slight depreciation of the markka in summer 1994. In order to curb the rise in interest rates, the Bank of Finland allowed for a relatively high level of liquidity in the money market, and the markka was supported with small interventions. The positive vote eased the situation, and during the latter part of the year the markka appreciated by nearly 10%, in terms of both the ECU and the foreign trade-weighted index. In the summer it became possible to repurchase foreign currency that had been sold, and the foreign exchange reserves grew substantially again for the whole year 1994. At the onset of the float, the foreign exchange reserves were large, perhaps excessively so (eg relative to the central bank's capital account), at more than 10% of GDP (incl. forward positions). The tender rate fluctuated, most of the year just over 5%, but ended the year slightly above 5.5%.

Before Finland joined the EU, the Bank of Finland signed agreements with other EU central banks on the Exchange Rate Mechanism (ERM), which was a part of the EMS, and a short-term financing arrangement. However, Finland, unlike Austria, did not join the ERM. Pegging of the markka within the ERM was not deemed realistic – from the viewpoint either Finland or the ERM countries – in light of the recent period of uncertainty, which had attracted international attention.

Finland at the time was fairly far from meeting the detailed convergence criteria set out in the Maastricht Treaty as requirements for EMU membership. However, largely due to the crisis of the early 1990s, the Finnish economy was much more closely integrated with Europe than it had been five years earlier.

The main EMU criteria were (1) average CPI inflation for the year before the examination not to exceed by more than 1.5 percentage points that of the three best performing Member States in terms of price stability, (2) ratios of planned or actual government deficit to GDP and government debt to GDP not to exceed 3% and 60% respectively, (3) compliance with the ERM's normal fluctuation margins without severe tensions for at least the last two years before the examination, (4) average nominal long-term interest rate for the year before the examination not to exceed by more than 2 percentage points that of the three best performing Member States in terms of price stability.

At the time, it seemed that Finland was able to easily fulfil only the inflation criterion. The CPI rose at an annual rate of only about 1% in the latter part of 1994, although there was concern about the effects of the wage settlement agreed at the turn of 1994–1995. Finland's general government debt clearly amounted to less than 60% of GDP, but the general government deficit for 1994 had again amounted to more than 5%.

The exchange rate criterion caused the most concern. The markka's exchange rate, which had been extremely volatile, had started on a clear upward trend and by end 1994 had nearly reached the pre-float level. Floating was in fact seen as beneficial as a means of determining a realistic and stable exchange rate. The long-term yield on government bonds had risen, along with international yields, back to around the 10% level – clearly above the interest rate criterion. On the other hand, it seemed fairly certain that the interest rate criterion would be met if the other criteria were met, as evidenced by the fact that national levels of long-term yields converged well before adoption of the single currency, except for minor differences related to liquidity and risks.

An additional requirement set out in the Maastricht Treaty was that the central bank be guaranteed independence as regards monetary policy. Although the Bank of Finland, by international standards, had been relatively independent of the Government, it was clearly subordinate to Parliament. For example, the base rate was decided by the nine-member Parliamentary Supervisory Council. The Government in the final analysis determined the exchange rate, albeit requests for changes in the rate had to come from the Bank. The fact that the Bank was not independent of the Government, in the treaty sense, became quite clear in spring 1992 when the Bank's governor was forced to resign as a result of a dispute with the Prime Minister. The Bank's loss of credibility in this connection again led to unstable market conditions.

5.2 Monetary conditions were favourable at first but unsettled in 1996

EU membership did not immediately affect Finnish monetary policy in any essential way. Integration and the related perspectives, however, did mean that developments related to the monetary policy regime and financial institutions in general were guided to a greater extent by events in other EU countries, albeit these were not highly unified. The Bank of Finland, based on EU membership, participated in preparatory work within the EMI, eg in the development of Eurosystem monetary policy instruments. One significant outcome of these efforts was the above-mentioned averaging feature of the minimum reserve system, effected in October 1995.

The markka was floating. Largely because of Mexico's problems, the international currency markets were turbulent in 1995. Of the ERM currencies, those of Spain and Portugal had to be devalued. The Finnish markets, by contrast, generally remained calm, and the markka continued to appreciate slowly up to year-end.

The tender rate continued to gain stature as the key interest rate of monetary policy. In connection with a rise in international interest rates, the Bank had raised the rate via a fixed rate tender in December 1994. In February the rate was raised to 5.75%, and in June to 6%. The differential in three-month rates vs Germany increased to nearly 1 percentage point, whereas Finnish long-term rates (over 10%) were nearly 3 percentage points higher than corresponding German rates. However, in the course of the year the differential narrowed substantially. In the second half of the year Finnish interest rates began to follow the international downward trend. By December 1995 the tender rate had fallen to 4.25%. The traditional – but no longer highly significant – base rate was lowered at that time to 4.75%, which was exactly half of its peak level of 9.5% reached in 1992.

The decline in interest rate was enabled by a decline in inflation and inflation expectations to less than 2%, in fact nearly to zero. Thus the inflation target for 1995 – set in 1993 – was achieved, albeit this was partly due to a one-off drop in food prices in connection with EU membership.

Toward the end of 1995 the markka began to depreciate, continuing the trend until the early months of 1996. The weakening of the currency was a result of speculation in connection with the ERM link-up, as well as temporary sluggishness of the Finnish economy. The ERM link-up was – according a strict interpretation – one of the requirements of the Maastricht Treaty in connection with the two-year period, since the decision on which countries would join Stage Three of EMU (slated to begin at the start of 1999) was to be made at latest in the spring of 1998. The press, and especially the domestic markets, expressed the view that that the markka's exchange rate was then too high for the ERM link-up.

The Deutschemark rose in value from FIM 2.97 in December 1995 to a peak of FIM 3.16 in May 1996, ie a rise of some 6%. The trade-weighted index (a rise in which indicated markka depreciation) rose by about 7%, which meant that the markka had depreciated even more vs other currencies on average than vs the Deutschemark. More than 10% of total foreign exchange reserves were sold (spot), but this only moderately eased market pressures.

In May the market pressures were reversed, albeit the foreign exchange reserves continued to decline for a time because of repayments on central government debt. The markka was strengthened by an inflow of capital from abroad, probably due in part to parliamentary approval of a change in the Currency Act that enabled more flexible decision-making in connection with the ERM link-up. Foreign investors began to have confidence in the markka and its readiness for the ERM. In the summer the markka again appreciated vs the Deutschemark, to a FIM: DEM rate of 3, and in the autumn the markka strengthened even further.

It was again possible to lower the level of Finnish interest rates. In July the tender rate was already down to 3.5%, and in October it was lowered to 3%, ie the same as the Bundesbank's repo rate. The differential vs Germany for the yield on ten-year government bonds narrowed to about one-half percentage point. Thus, in terms of interest rate level, Finland had reached the average for ERM countries, on a par with Denmark and Ireland. Within the ERM, France experienced some minor problems, but for the most part conditions in the foreign exchange markets remained calm.

6 Membership of the EU's Exchange Rate Mechanism (ERM)

6.1 ERM linkup in October 1996

In the environment of the European Union (EU), the Bank of Finland and the Government together had explored the prospects for linking the markka to the ERM. Over the previous couple years, the exchange rate and the financial markets had stabilised in accord with objectives, nor did ERM countries any longer express doubts as to Finland's eligibility for the ERM. Government's outspoken goal was for Finland to be part of the first wave of countries to enter Stage Three of EMU and therewith adopt a single monetary policy and a single currency – the euro; the name of the single currency had been changed from ECU to euro in December 1995. Postponement of Finland's membership until the autumn had raised doubts about Finland's fulfilment of the two-year-criterion concerning exchange rate behaviour and ERM membership. The Italian lira was joined to the ERM even later, toward the end of November 1996.

The key issue to be decided – not only for Finland but for the other EU countries as well – was the rate at which the markka should be linked to the ERM, against the background that the rate chosen was to be consistent with the final conversion rate for changeover to a single currency. Although the decision formally concerned the markka's ECU rate, it was in fact taken on the basis of the exchange rate vs the Deutschemark. The FIM:DEM rate had been highly volatile during the 1990s. Before the markka devaluation in 1991, the FIM:DEM rate was about FIM 2.30–2.40. The markka hit its weakest level in 1993 when the FIM:DEM rate was 3.60. The fact that the markka was floating facilitated the choice of an appropriate exchange rate. In 1995–1996 the markka had fluctuated between FIM 3.16 and FIM 2.95, gradually stabilising at about FIM 3 (Chart 5).

Extensive studies of the equilibrium exchange rate were also conducted at the Bank of Finland, but the results varied greatly. A number of factors argued in favour of a rate below FIM 3.0. It was feared that too weak an exchange rate would generate inflationary pressures in an economy that was growing at a healthy rate, especially considering that the interest rates were to be fixed at a low level. On the other hand, a relatively weak ECU central rate could be justified by eg the continued heavy external indebtedness of the Finnish economy (about 50% of GDP), and repayment of the debt required a sustained large current account surplus. Furthermore, at the time, the Deutschemark, like the ECU, was very strong vis-à-vis the dollar.

On 12 October 1996 the Government finally decided to join the Finnish markka to the ERM. It was generally held that the performance of the Finnish economy and consistent economic policy had provided a foundation for stabilising the external value of the markka. The markka's central rate was agreed within the Monetary Committee, under the ECOFIN Council, in a fairly broad consensus. The markka's ECU central rate was set at FIM 5.80661, the bilateral Deutschemark central rate being FIM 3.0400. The agreed central rate was thus close to the average level that had prevailed for the markka vis-à-vis major ERM currencies over the past couple years. In the opinion of the Bank of Finland, the central rate was consistent with both forecasts and the requirements that had been placed on economic performance and competitiveness for the years ahead, however, provided that both the consolidation of central government finances and the moderate cost trend would continue.

The ERM and its basket currency comprised a highly complex whole. The complexity was related to the aim of the scheme, to afford equal treatment to all the currencies. Accordingly, in connection with the ERM linkup, bilateral exchange rates and fluctuation limits were set for the markka in relation to all the ERM currencies. With the ERM's fluctuation margins of (approximately) 15%, the Deutschemark intervention limits became FIM 3.53 and FIM 2.62. Within the ERM, no intervention limits were defined against the ECU. In fact the Deutschemark was always the anchor currency.

In keeping with the Maastricht Treaty, new currencies, such as the Finnish markka, were no longer included in the ECU basket. In other words, the value of the ECU was not made dependent on the markka's exchange rate but continued to be based on the same 12 EU currencies. The non-ERM currencies of the United Kingdom, Italy and Greece remained in the ECU basket while the ERM currencies of Austria and Finland, as well as the non-ERM Swedish currency, were excluded. The complexity of the regime was further reflected in the adjustment of ECU central rates almost always after a change in the situation, as eg after the joining of the Italian lira a good month after the markka was joined. The ECU basket existed alongside a market or commercial ECU, which resembled a genuine currency – save for the obvious fact that it lacked a cash embodiment – and for which the exchange rates and interest rates, for various reasons, deviated somewhat from those of the calculated basket value.

Finland's membership of the ERM became effective on 14 October 1996. The linkup went smoothly. Although the exact date of the decision came as a surprise, the decision itself had been taken for granted. The selected exchange rate level was a couple per cent weaker than the market rate and thus not far out of line with expectations. Consequently, the immediate impact on interest rates and exchange rates was modest. At the time of the linkup, the markka exchange rate vs the Deutschemark remained in the region of FIM 2.99. In the autumn the markka depreciated to close to its central rate, only to appreciate again toward the end of the year. In relation to its ECU central rate, the Finnish markka was one of the strongest currencies within the ERM.

In connection with the ERM linkup, the Bank of Finland announced that it would continue to pursue the price stability objective but also underlined the importance of exchange rate stability. Thus, despite the regime switch, the Bank of Finland was determined to continue to pursue a domestic monetary policy, and the rationale for the minor changes in interest rates in the following years was typically tied to the outlook for prices. The Bank's objective was to keep the markka quite stable within the ERM, albeit allowing fluctuations in the region of 1–2%. Maintenance of a stable exchange rate regime was not difficult at first. The Bank of Finland intervened in the exchange market only to a minor extent, and in both directions, toward the end of 1996. There were no operations in the forward exchange markets at any time during the year. By year-end the Bank's international reserve assets (incl. the forward position) had declined to roughly half the level as at the end of 1994.

The chosen exchange rate level remained permanent and was consistent with the final conversion rate for changeover to the euro. In light of subsequent developments, the selected rate turned out to be very low. With the clear depreciation of the ECU – and hence the markka – and subsequently the euro vs the dollar and other currencies over the following years, and with the domestic costs remaining fairly well contained, Finland's international price competitiveness remained exceptionally good over a long period of time. This was mirrored eg in very large current account surpluses (6–7% of GDP) around the millennium change.

6.2 The general government sector also met the EMU convergence criteria

The performance of the Finnish economy was favourable as Stage Three of EMU drew closer. Robust economic growth continued and unemployment declined though it remained among the highest in the EU countries. In 1997 inflation picked up slowly but still remained within the 2% target. Corporate profitability remained good and share prices rose partly due to strong demand by nonresidents. Nonresidents' holdings accounted for nearly 50% of the total value of listed shares. The market value of shares, which had been quite modest, now started to approach annual nominal GDP. The banking crisis was over, but the declining trend in the stock of bank lending that had persisted for several years was reversed only in 1997.

Central government tax revenue increased rapidly again in 1997, partly in response to marked growth in corporate tax revenue. The very large central government deficit declined rapidly. The Government took a decision to keep annual total budget expenditure roughly unchanged over the period 1998–2001.

The EU's ECOFIN Council in May 1997 removed Finland from the list of countries with excessive general government deficits. The decision was based on the fact that the deficit had declined quickly (becoming a surplus by 1999, according to the revised 1996 convergence programme). The ratio of general government debt to GDP had stayed below 60%. In 1996 the general government deficit still exceeded 3% of GDP but in 1997 it had fallen clearly below the reference value, actually close to 1% of GDP. Finland thus met the general government deficit criterion set out in the Maastricht Treaty.

Fulfilment of the EMU convergence criteria for the general government sector involved some significant definitional problems. In particular, the accounting treatment of the Finnish statutory earnings-related pension scheme had to be reconsidered. The design of the Finnish statutory earnings-related pension scheme introduced back in the 1960s is exceptional in that the main provisions on benefit structure and eligibility criteria are laid down by the government, although the scheme is in fact operated by private insurance providers. These insurance providers are also responsible for investing the accumulating funds, albeit subject to restrictions imposed by the government. In the National Accounts, the pension scheme had been included in the private sector. However, with the EU's approval, the scheme was now transferred to the general government sector. The surplus generated by the scheme contributed towards the fulfilment of the general government deficit criterion. Its impact was visible still in 1997, but not in subsequent years.

6.3 Decisions in the field of incomes policy

Membership of a single currency area of low inflation imposed a clear and powerful restriction on incomes policy. The loss of the devaluation option was recognised by labour market organisations on both sides. The trade unions said they appreciated the importance of wage moderation, whereas the employers announced that they would in principle refrain from demanding wage cuts.

However, in the face of expected cyclical problems in the EMU context as well, the government together with the labour market organisations took measures to build up ‘cyclical buffer funds’. The severe recession in the early years of the decade had prompted a substantial increase eg in unemployment insurance contributions, which had aggravated the situation in this regard. Now the aim was to keep contribution rates stable over the years ahead.

In November 1997 the central labour market organisations made an agreement to build up two separate buffer funds, designed to smooth out fluctuations in labour costs. It was decided that an amount representing nearly 0.5% of GDP be set aside in an Unemployment Insurance Fund by the period 2002–2004, to finance the unemployment insurance scheme. The fund, which is also entitled to borrow, serves to ensure that the rate of unemployment insurance contribution payable by wage earners and employers can be kept unchanged for some years in periods of economic slack. Another, slightly larger buffer fund was built up within the statutory earnings-related pension scheme, for collection of pension contributions from both employees and employers. Total assets in the two funds were estimated at 2–3% of total wages.

This was not an entirely new approach in that contribution rates had also in the past been adjusted in response to cyclical conditions. The funds will remain relatively small and, although fund assets grew more than expected during the following years of strong economic performance, their practical importance is far less than that of the devaluations of the past. It must also be borne in mind that the statutory earnings-related pension scheme, being part of the general government sector, could be constrained by the 3% limit for the whole general government sector. It has also been suspected that timely usage of the funds may be difficult. In any case, the funds are clearly of some importance.

6.4 The last currency speculation and calmer markets

According to the Maastricht Treaty, Stage Three of EMU could have started already before 1999 but there were clear indications that the changeover would take place on the latest date allowed by the Treaty. Some serious proposals for an even later start were advanced, but they tended to foster uncertainty in money and foreign exchange markets.

With the changeover date gradually becoming an established fact and the situation stabilising within the ERM, market confidence in the transition to a single currency and single monetary policy also strengthened. Consequently, the prospective EMU currencies started to converge more definitively in terms of exchange rates and interest rates. Considering also that the Bank of Finland deemed it essential that the markka remain stable within the ERM, the scope for an independent monetary policy started to diminish. The Bank's management nonetheless stressed that the responsibility for monetary policy would remain with the Bank up until the very onset of Stage Three.

In January 1997 the Finnish markka was surprisingly subjected to heavy speculation. This time the markka was subjected to upward pressure, as foreign investors, especially, started to purchase markkaa in large amounts. Underlying this behaviour was probably the view of global investment banks and other players that the markka's conversion rate would be too low in light of the strong performance of the economy. As so often before, the shift in international investment flows started elsewhere in the Nordic countries. This time, the Norwegian krone had been earlier on subjected to upward pressure.

The Bank of Finland responded by purchasing foreign currency in such large amounts that the foreign exchange reserves (incl. the forward position) doubled in January. Representing more than 5% of GDP, the interventions were very large even by international standards. Forward market interventions were conducted to neutralise a third of the immediate accumulation of the reserves and liquidity effects. Nonetheless, the Bank eventually had to allow the markka to float at about 5% stronger than its Deutschemark central rate. The Bank also announced that henceforth the central government might tap the markets directly for foreign exchange to meet its foreign payments. Official interest rates were however kept unchanged. Subsequently calm was suddenly restored and the markka fell back to its pre-appreciation level within a few days.

In the following months calm continued to prevail both in the Finnish foreign exchange market and within the ERM. The Irish punt alone was continuously subject to heavy revaluation expectations, remaining clearly stronger than its central rate. The Deutschemark, however, depreciated against the dollar, which apparently boosted demand for the Finnish markka again in the spring, and the markka began to appreciate. The Bank of Finland again purchased foreign currency, now in much smaller amounts. The remainder of the year was calm. The volatility of the dollar occasionally generated moderate – primarily downward – pressure on exchange rates and interest rates of other countries, mainly in southern Europe. These countries were surrounded by uncertainties concerning either their participation in the first wave of countries to join Stage Three or the use of their central rate as the final conversion rate. Similarly in 1998, various currencies continued to come under pressure, strengthening pressure in the case of the Finnish markka. However, only the central rate of the Irish punt was slightly adjusted.

Moderate upward pressure on prices – stemming partly from markka depreciation, as reflected by a decline in the trade-weighted currency index – prompted the Bank of Finland to raise its tender rate 25 basis points to 3.25% in September 1997. Interest rates were also raised slightly in Germany and many other ERM countries, with the German interest rate hike, as usual, being immediately followed by rate increases in neighbouring countries. The Bank of Finland did not find it appropriate to track German interest rate measures this closely, despite the limited scope for pursuing an independent interest rate policy. The conduct of an independent interest rate policy was in principle possible until the very onset of Stage Three but not in practice, partly because of the general awareness of the temporary nature of interest rate hikes. Fortunately the balanced performance of the Finnish economy continued and inflation seemed to be settling below the 2% level.

As confidence in the use of the central rate as the final conversion rate strengthened, convergence of interest rates and exchange rates continued. The markka forward exchange rate was actually known on 1 January 1999, and hence covered interest rate parity began to hold between exchange rates and interest rates. Insofar as a country's interest rate was higher than the German rate, its currency had to be stronger too, to ensure that the depreciation was consistent with the interest rate differential. In practice, interest rate parity did not fully hold, even for the Finnish markka, which apparently continued to face a moderate risk of revaluation for the remainder of the time before the start of Stage Three.

6.5 Changeover to the single currency and single monetary policy

Markets were very calm in the year before the changeover and the final decisions could be taken without major problems. Monetary policy continued to be relatively easy. However, the rate of inflation was already higher in Finland than the average rate for the prospective euro area countries, which prompted a moderate increase in the tender rate, by 15 basis points to 3.4% still in spring 1998.

Long-term yield differentials vs Germany had narrowed to less than 50 basis points already in the course of 1997 in all prospective EMU countries. They narrowed further in 1998, except for late summer, at the time of the Russian financial crisis, which had major repercussions for global currency and financial markets. The impact on ERM currencies, including the Finnish markka, nonetheless remained subdued. At the time of the changeover to the euro, the interest rate on the Finnish government 10-year bond was as low as 4.0%.

At the EU summit held on 2–3 May 1998, the heads of state and government decided on the eleven countries that would be in the first wave to join monetary union. Countries of importance to Finland, ie Sweden, Denmark and the United Kingdom, did not join in the first wave, which was a disappointment to Finland, considering Finland's volume of trade with these countries, which was roughly the same as that with the first wave countries. Finland's trade with non-euro area countries thus came to be the largest in the euro area, representing about two-thirds of Finland's total trade.

In connection with the summit, a pre-announcement was issued on the bilateral conversion rates for the prospective euro area currencies to be fixed on 1 January 1999 and an assurance that they would no longer be changed. The decision on the participating countries and the pre-announcement of the fixing of the bilateral conversion rates had a stabilising effect on the money and foreign exchange markets of the prospective euro area countries.

Following the decisions taken at the summit, the members of the Executive Board of the ECB were confirmed and the European Central Bank commenced operations on 1 June 1998. The ECB was largely based on the EMI, which had been mainly responsible for the preparations. The ECB elaborated the monetary policy strategy, defined its price stability objective (below 2% in the medium term) and designed the two-pillar system based on a reference value for money supply growth, price indicators and other indicator variables. At its meeting in early December, the Governing Council of the ECB set a reference value of 4.5% for the growth rate of the broad monetary aggregate.

The ECB's monetary policy strategy differed from the inflation targeting strategy applied by the Bank of Finland during the floating rate regime. In Finland, money supply had never been employed as a monetary policy target, although developments in banks' total lending and deposits and related upward pressures on prices had of course always been monitored. However, the monetary policy instruments of the ECB closely resembled the arsenal that had been in use by the Bank of Finland for a number of years already.

At the same December meeting of the ECB Council it was agreed that the national central banks in the final phase adopt a harmonised steering rate of 3%, which then became the initial rate for the single monetary policy. Some central banks, mainly in the southern EU countries, were forced to lower their rates significantly toward the end of the year but in Finland interest rates had to be reduced only slightly. The Bank of Finland took its last interest rate decisions on 3 December 1998 when it lowered the tender rate from 3.4% to 3.0%. At the same time, the base rate was set at 3.5% with effect from 15 December (in line with the new rate now to be defined by the Ministry of Finance). The rate cut was not well suited to the strong performance of the economy, and hence in the early stages of the euro there was concern that the relaxed financial conditions would generate inflationary pressures. This concern was further heightened by the reversal in early 1999 of the upward trend in the euro exchange rate witnessed toward the end of 1998. Domestic costs could however be surprisingly well contained.

At the EU's summit in May the final conversion rates against the euro could not yet be fixed because the Maastricht Treaty did not allow changes in the value of the euro in connection with the changeover. The problem was due to the fact that the currencies in the ECU basket were not identical with the prospective

EMU currencies. In particular the volatile pound sterling caused the ECU to fluctuate. It was only in the evening of the last day of 1998 and on the basis of the exchange rates then prevailing that the EU Council fixed the conversion rates against the euro for each currency, with an accuracy of six significant digits. The markka's rate was to be 5.94573 per euro.

6.6 System changes and legislative reforms in the final years

The final major changes in the monetary policy framework of the Bank of Finland were made in November 1997 in connection with the preparations for a single monetary policy. At that time, the Bank began to apply two-week, instead of one-month, maturities in its tenders and one-day, instead of seven-day, maturities in its liquidity credits and shortened the lag for tender operations from two business days to one after the trade date. Moreover, the quantitative limits on credit were abolished, but the collateral requirement remained. This reform meant that the liquidity system now provided a symmetrical interest rate corridor for the interbank overnight rate. In June 1998, the Bank switched from the former 365-day rule to the actual/360 day rule for calculating interest on credits within the Eurosystem.

It was necessary in the final years before the euro to engage in thorough discussions on adapting the domestic financial markets to EMU requirements. Measures were taken in cooperation with the banking sector to integrate the Bank of Finland's RTGS system (BoF RTGS) with the TARGET payment system of the EU central banks. With the changeover to a single currency, the process of change in the securities markets already brought on by tightening competition and technological advances accelerated further. Securities registration and securities clearing and settlement became more effective when the Finnish Central Securities Depository Ltd (APK) opened for business at the start of 1997. It brought together the previously decentralised institutions and systems of the money and securities markets.

The alignment of domestic interest rate regimes in the context of a single currency and a large money and securities market area also warranted thorough discussion. Responsibility for calculating the base rate was shifted to the Ministry of Finance. After its long history as a policy rate, the base rate had now practically lost its position in the financial markets. It remained in use as a reference rate for many financial arrangements related to fiscal policy. The base rate was henceforth fixed directly on the basis of the twelve-month market rates, with validity for the following six months.

As regards market reference rates, the Bank of Finland announced in December 1997 that it would stop quoting reference rates in the following year. In the event, the Bank continued to quote them until the end of 1998. In spring 1998, the Finnish Bankers' Association started to calculate Helibor rates according to the principles formerly applied by the Bank, and the banking sector switched over to using these rates. However, immediately at the start of Stage Three, the Finnish markets also in effect changed over to euro area-wide Euribor rates. Euribor rates were also substituted for Helibor rates in existing contracts, as decided by the Ministry of Finance on the basis of a special law. The change of reference rates posed no problem to contracting parties, given the close alignment of Helibor and Euribor rates. Finnish banks, having fully recovered from the banking crisis, were no longer subjected to major risk premia.

The EMU criteria also entailed harmonisation of national legislation, especially central bank legislation, with the treaties governing monetary union. A major overhaul of legislation was necessary in Finland too. The new Act on the Bank of Finland was drafted in 1997 and took effect at the start of 1998. It includes revised provisions on the division of responsibilities between the Bank's Board of Governors and the Parliamentary Supervisory Council appointed by Parliament. Council members were no longer to participate in tasks of monetary policy or operational matters but were to focus primarily on supervisory and administrative functions.

Some of the legislative amendments were left for 1998 when the changes necessitated by the integration of the Bank of Finland into the European System of Central Banks (ESCB) were implemented. The Bank's tasks were aligned with those of the European Central Bank. The major part of the changes concerning the Bank of Finland took effect on 1 January 1999 when Finland became part of the euro area. The legal provisions on the independence of the Bank of Finland and the independence and competence of the Bank's Governor, when acting as a member of the ECB Governing Council, were enforced already from the start of May 1998. Some of the laws relating to banks' business operations were also revised. The resolution on a parliamentary guarantee for the Finnish banking sector was repealed at the end of 1998.

The elaboration of the various tasks of the ESCB was an extensive project to which the Bank's departments contributed within committees and working groups. Work concentrated on areas such as monetary policy systems, payment systems, the ECB's foreign reserves, harmonisation of accounting practices and distribution of monetary income, production of euro banknotes and coins and harmonisation of statistical systems and IT systems. In many respects, Finland's former national framework had been simple in comparison with the somewhat more detailed and bureaucratic operating tradition that now had to be accommodated.

The institutional changes and ECB decisions highlighted the need for a major reform of statistical systems. The continuity of many statistics and statistical series was broken. The main national responsibility for the collection of banking statistics had to be shifted from Statistics Finland to the Bank of Finland, which already provided a vast amount of financial statistics. During the first few years, the production of traditional national statistics continued alongside the ECB's statistical system.

With the changeover to a single currency, the monitoring of the domestic foreign exchange market was discontinued and foreign exchange market statistics were no longer compiled in 1999. Harmonised practices for the quotation of foreign exchange rates were adopted for the euro area. The Bank of Finland was responsible for practical measures concerning the quotation of the foreign exchange rates of some of its neighbouring countries. The conceptual ambiguity surrounding the history of the euro was problematic in a statistical sense. Depending on the purpose, histories of the Finnish markka, the Deutschemark or the ECU basket were generally used instead. The Bank of Finland continued to calculate the former national trade-weighted currency index, but in addition some indices were calculated as agreed within the ECB. The indices were calculated both exclusive and inclusive of the euro area countries. Within the ECB it was agreed that these national indices would no longer be called exchange rate indices or effective exchange rates but would henceforth be termed national competitiveness indicators. The effective euro exchange rate is calculated using only euro area-wide trade weights.

The euro being a major floating currency, it was to be expected that foreign exchange market interventions would rarely occur. The euro area countries, including Finland, were left with fairly substantial foreign exchange reserves, in the new situation. A minor part of these reserves were transferred to the ECB. The Bank of Finland, like nearly all the other national central banks, nonetheless kept its foreign exchange reserves practically unchanged during the transition process.

The exchange of banknotes was left for 2002. Considering that the amount of banknotes in circulation in Finland is small by international standards, the changeover to euro banknotes will proceed more smoothly in this country than in many other euro area countries. The distribution of monetary income within the Eurosystem after the transition process will favour countries like Finland that have effective payment systems (small amounts of banknotes in circulation). Hence, the Bank of Finland will benefit financially from the new environment – via higher seigniorage – provided that the payment systems of the other countries do not become even more efficient.

7 Concluding remarks

The Governor of the Bank of Finland, Ms Sirkka Hämäläinen, was elected to the first six-member Executive Board of the ECB, for a five-year period. She was succeeded as Governor by Mr Matti Vanhala, who had also served the Bank for several decades, in various positions related to foreign exchange and monetary policy. They both also became members of the major decision-making body, the 17-member (18 after Greece joined the EMU) Governing Council. They were clearly among the most experienced members of the Council in the field of monetary and foreign exchange policy, given the developments witnessed in Finnish monetary and foreign exchange policy.

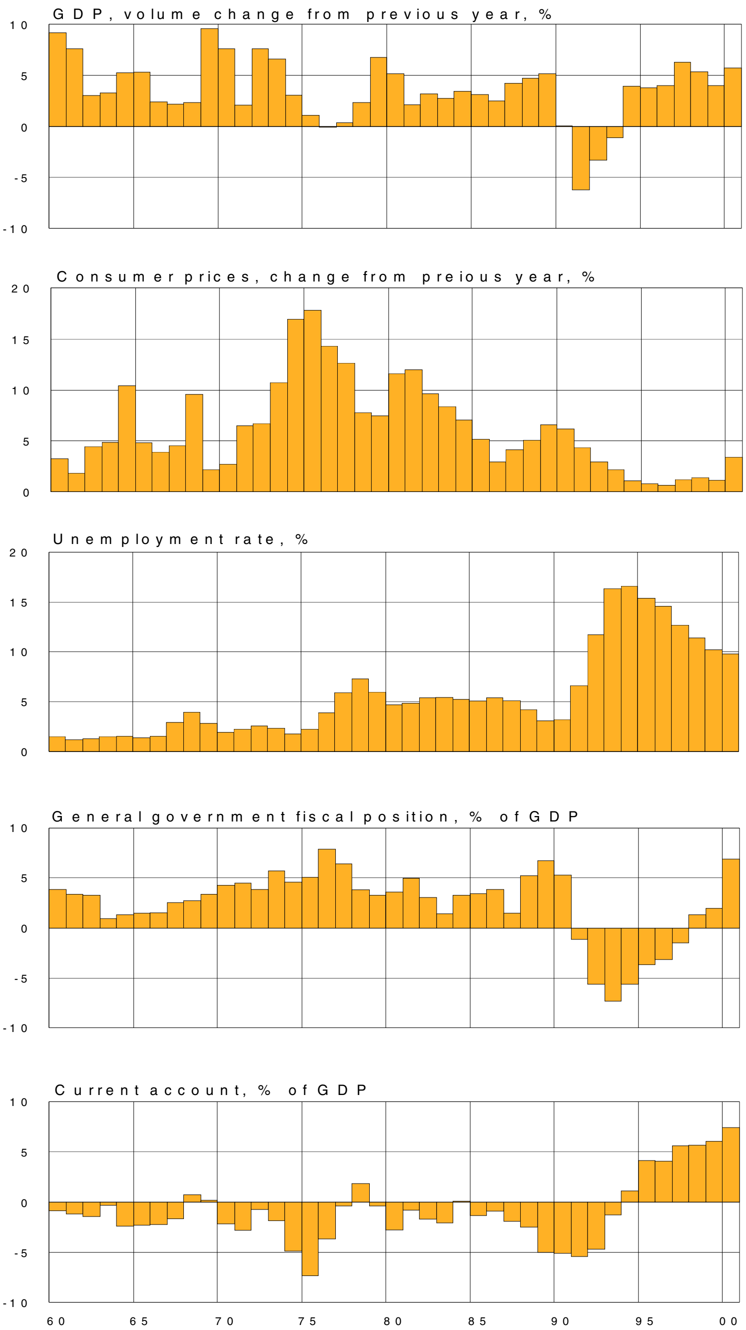
Over the course of a little more than ten years, the Finnish money and foreign exchange markets had undergone a profound transition. Financial market restrictions, of a regulatory nature, had been lifted and market-based monetary policy instruments had been substituted for the former, fairly highly regulated central bank financing system. The liberalisation had brought a great many surprises and difficulties, the severe banking crisis being the most serious of these. The crisis came unexpectedly and especially in the early stages, the Bank of Finland had to develop new means of crisis management. However, at the same time the financial system developed favourably and became increasingly globalised.

Finnish foreign exchange policy has actually been carried out within all the foreign exchange regimes, starting with financial market regulation and a fixed exchange rate regime, which prevailed until the 1980s. At that time, monetary policy and foreign exchange policy could be operated as separate areas of policy. The liberalisation of capital flows in the late 1980s resulted in the de facto loss of monetary policy independence in the context of a fixed exchange rate regime, and attempts at pursuing an independent monetary policy contributed to the collapse of the peg in 1992. The severe currency crisis gradually abated and a monetary policy strategy based on the price stability objective was introduced in 1993. This strategy proved very effective in the following years. Membership of the ERM in 1996 brought a new fixed exchange rate objective and severely limited the leeway for monetary policy. Commitment to monetary union and a strict transition process entailing some of the features of a currency board arrangement paved the way for the changeover from a national currency and national monetary policy to the single currency and single monetary policy of the EU at the start of 1999.

In Finland the adjustment to a single currency has proceeded surprisingly well in the final years before adoption of the euro. This was clearly a consequence of the economic crisis of the early 1990s, which – though in itself very severe and expensive – had brought balance to areas of the economy which had traditionally and almost continually given rise to problems. Problem areas included inflation in particular and cost developments in general, as well as the continuous tendency of the economy toward overindebtedness. The realism following in the wake of the crisis provided a strong foundation for participation in a single monetary union that sets very strict criteria for economic performance.

Charts 1–11.

Chart 1. **Finland: Key economic indicators**

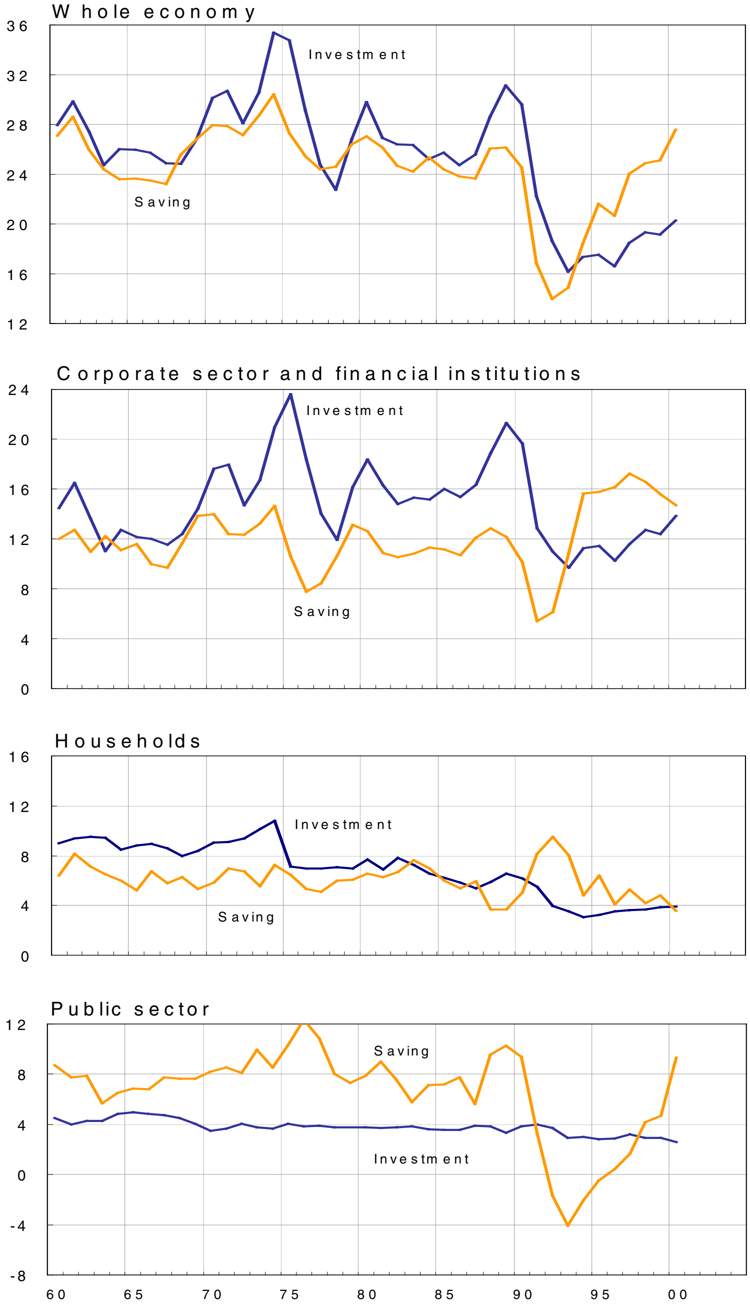


Source: Statistics Finland and Bank of Finland

Chart 2. **Saving and investment by sector**

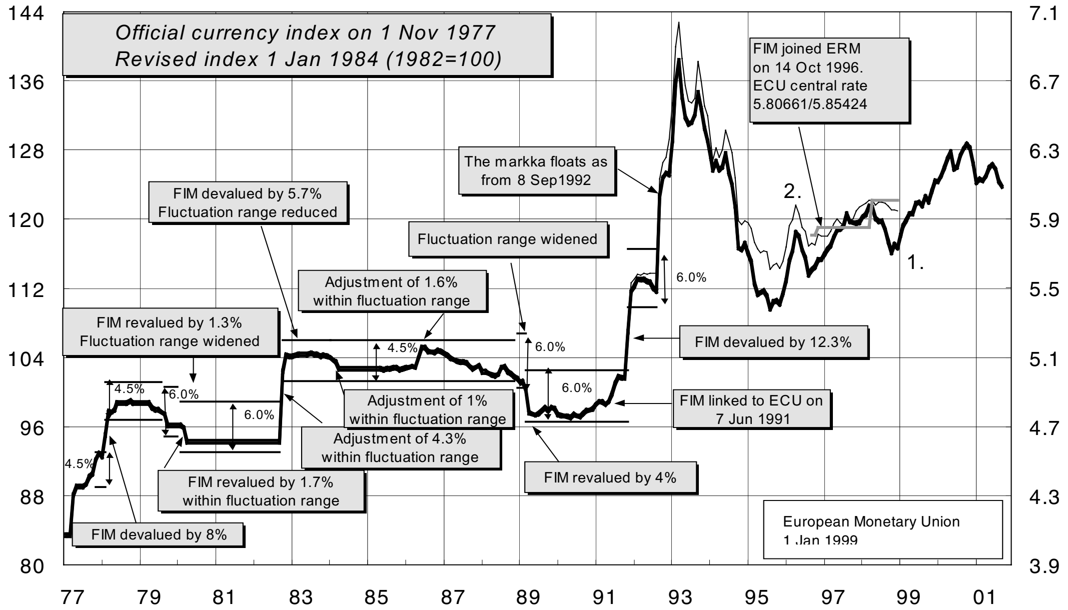
Gross saving and investment as percentage of GDP

Investment – Saving = Financial deficit



Source: Statistic Finland

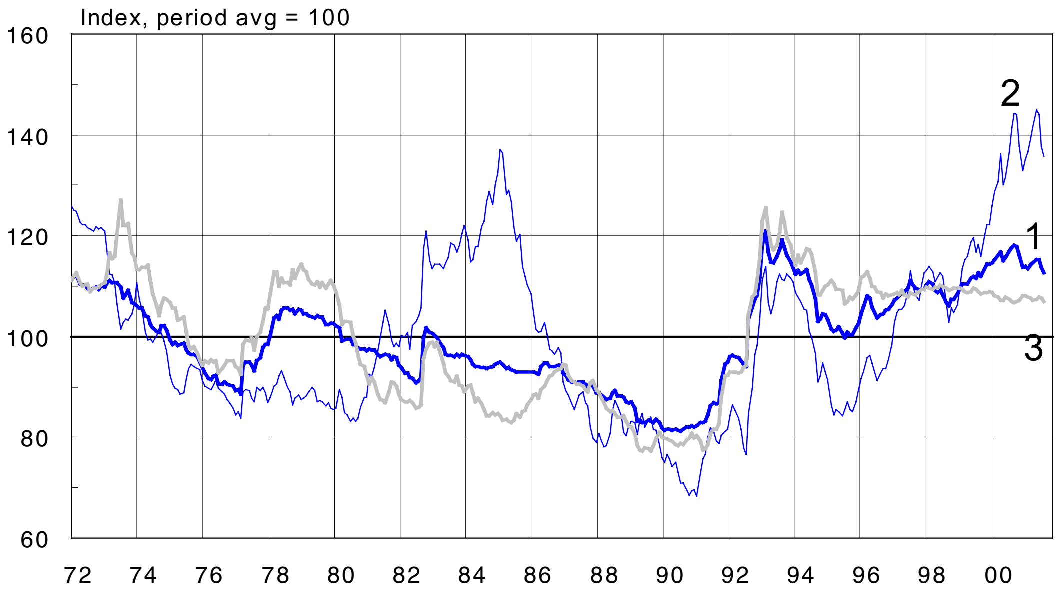
Chart 3. **External value of the markka**



1. Bank of Finland currency index (left scale), rising curve indicates markka depreciation.
2. Markka value of the ECU from 7 Jun 1991 (right scale)

1 Jan 1999

Chart 4. **Markka's real exchange rates**
Rising curve indicates markka depreciation



Source: Bank of Finland.

1 Finland's real exchange rate (narrow plus euro area competitiveness indicator)
2 Real FIM/USD-rate (CPI-adjusted)
3 Real FIM/DEM-rate (CPI-adjusted)

Chart 5. **FIM/DEM exchange rate**

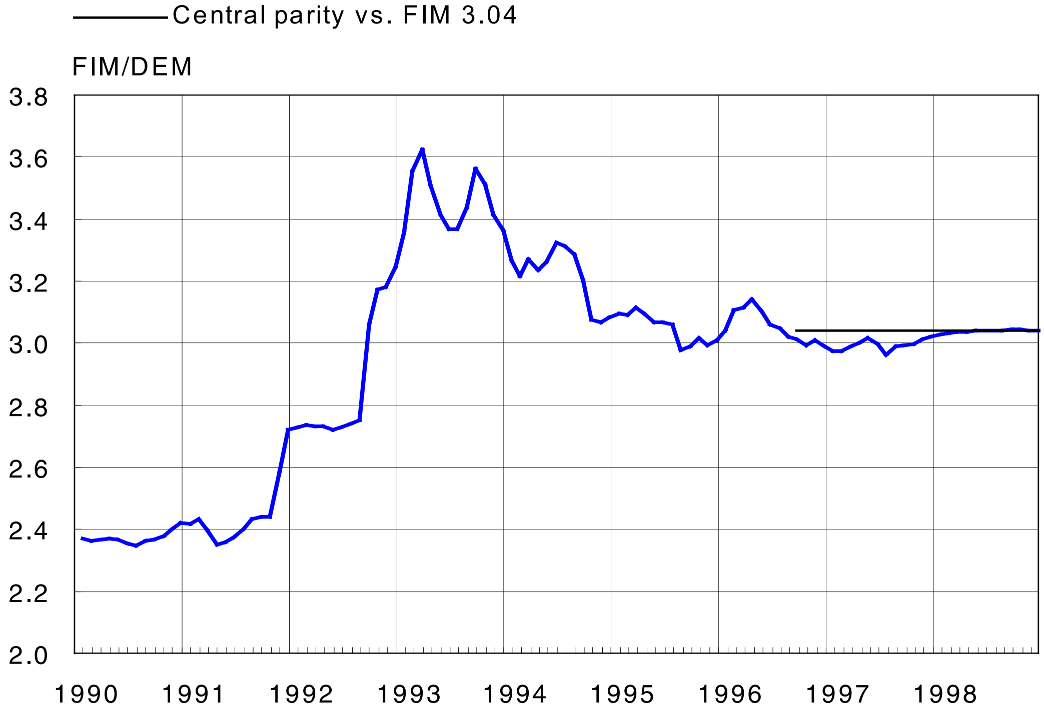
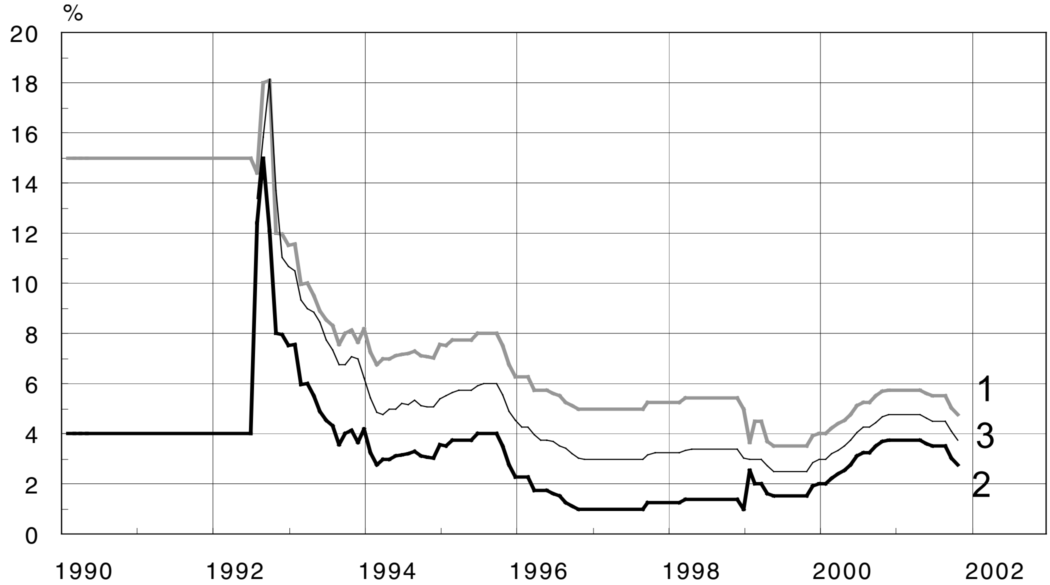


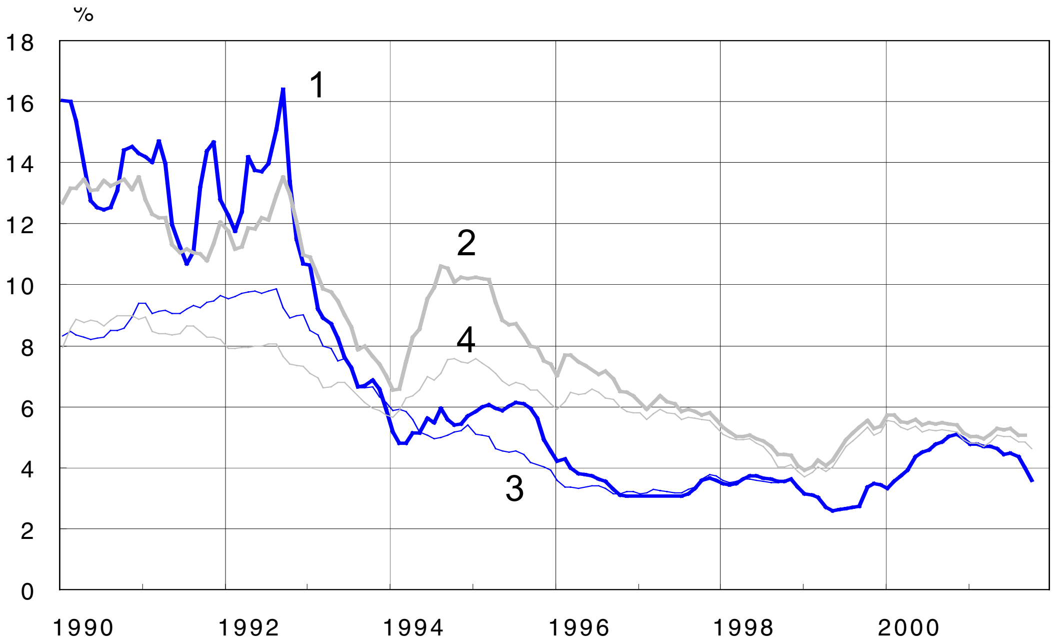
Chart 6. **Monetary policy interst rates**



Sources: European Central Bank and Bank of Finland.
Note: Bank of Finland interest rates until end 1998. Since 1999 ECB interest rates.

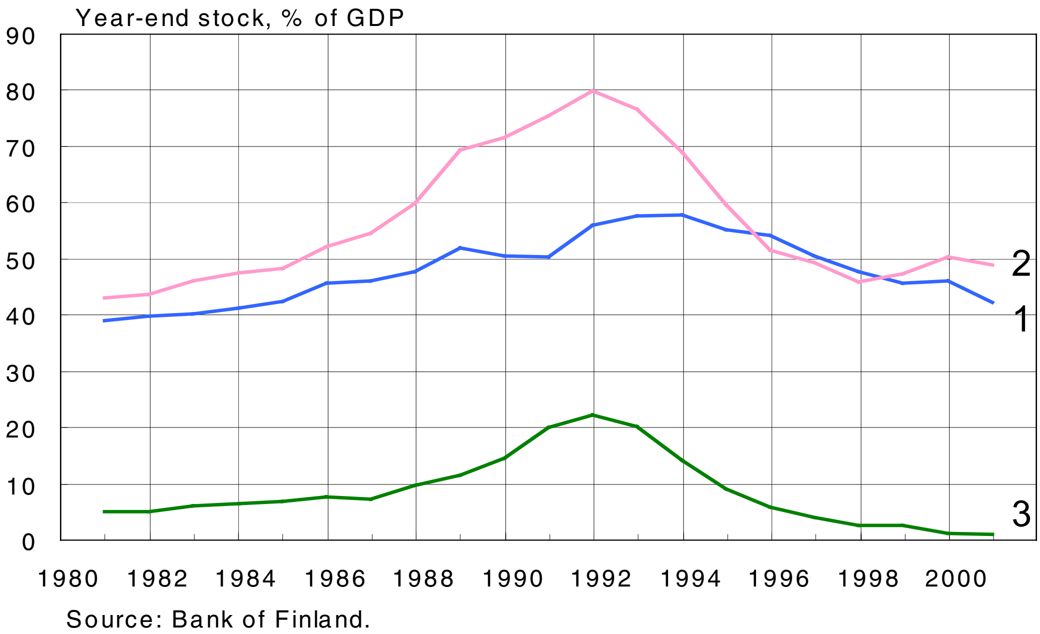
1 Marginal lending rate (liquidity credit rate until end 1998)
2 Deposit rate (excess reserve rate until end 1998)
3 Main refinancing rate / minimum bid rate (tender rate until end 1998)

Chart 7. **Interest rates in Finland and Germany**



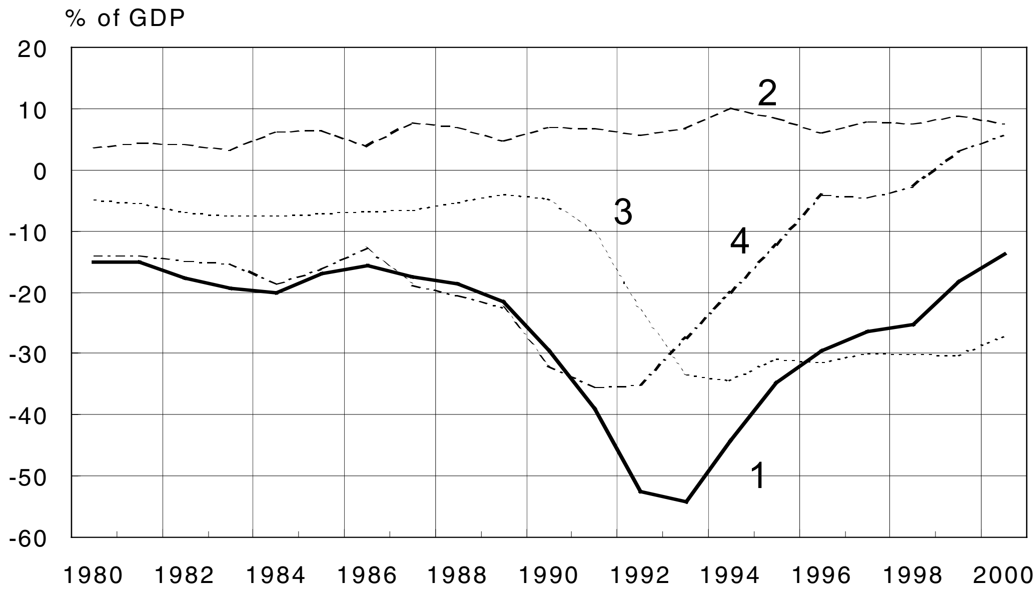
1 Finland, 3-month
2 Finland 10-year
3 Germany, 3-month
4 Germany, 10-year

Chart 8. **Bank lending and deposits**



1 Bank deposits
2 Bank lending
3 of which: lending in foreign currency

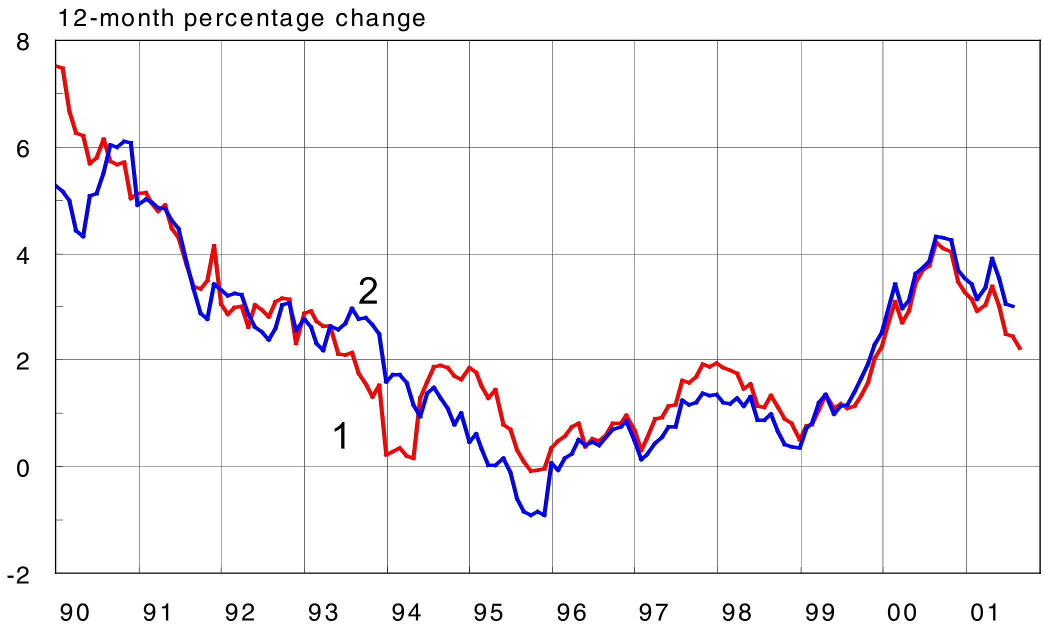
Chart 9. **Finland's net international investment position**



Sources: Bank of Finland and Statistics Finland.

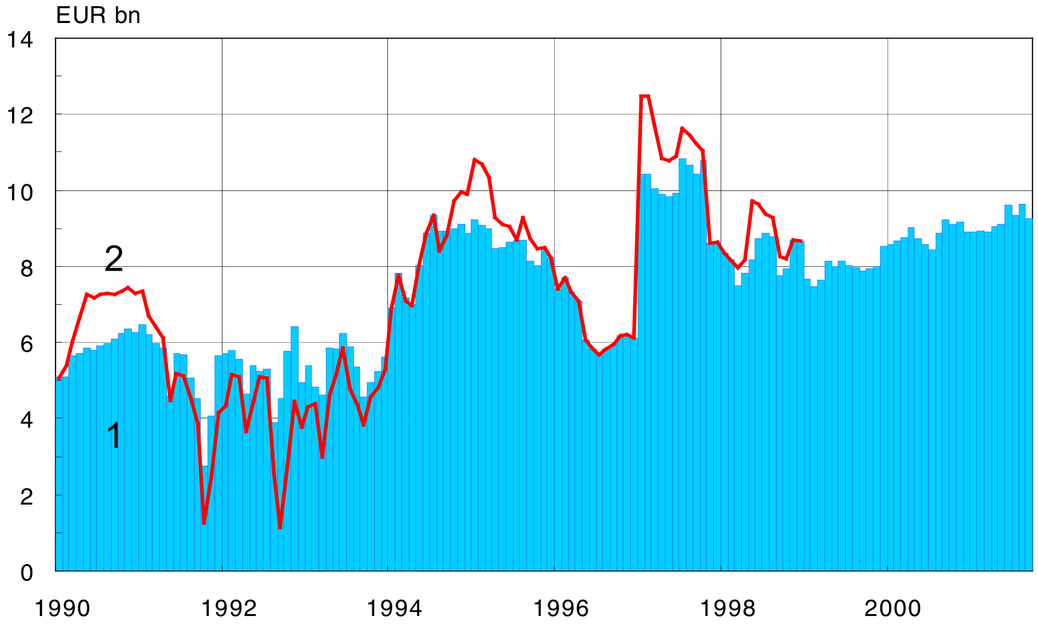
1 Total, excl. shares and other equity items
2 Bank of Finland
3 Central Government
4 Other sectors, excl. shares and other equity items

Chart 10. **CPI**



1 Consumer price index
2 Indicator of underlying inflation

Chart 11. **The Bank of Finland's foreign exchange reserves**



1 Foreign exchange reserves
2 Foreign exchange reserves plus forward position

References

The main sources are the Bank’s annual reports, the Bulletin and Markka ja talous.

The Finnish economic and banking crises are discussed in various English-language articles, for example:

Bordes, C. – Currie, D. – Söderström, H.T. (1993) **Three Assessments of Finland’s Economic Crisis and Economic Policy.** Bank of Finland, Publication, D:9.

Nyberg, P. – Vihriälä, V. (1994) **The Finnish banking crisis and its handling.** Bank of Finland Discussion Paper, 7/94.

Finnish Economic Papers (1996) **Special Issue on the Crisis of the Finnish Economy.** Vol. 9, No.1.

Vihriälä, V. (1997) **Banks and the Finnish Credit Cycle 1986–1995.** Bank of Finland Studies, E:7.

Vihriälä, V. (1997) **Causes of the credit bubble.** Bank of Finland Bulletin, March.

Honkapohja, S. – Koskela, E. (1999) **The economic crisis of the 1990s in Finland.** ETLA (The research institute of the Finnish economy) discussion papers, No. 683.

The Bank’s monetary and exchange rate policy and developments in the domestic financial markets in the 1990s are discussed in various English-language articles in the Bulletin:

Pikkarainen, P. – Tyrväinen, T. (1993) **The Bank of Finland´s Inflation Target and the Outlook for Inflation over the Next Few Years.** Bank of Finland Bulletin, June–July.

Åkerholm, J. (1994) **Finlands Experience with a Floating Exchange Rate.** Bank of Finland Bulletin March.

Lahdenperä, H. (1995) **The Finnish money market from the mid-1980s to the present day.** Bank of Finland Bulletin, February.

Saarenheimo, T. (1996) **A framewok for assessing the equilibrium exchange rate for the Finnish markka.** Bank of Finland Bulletin, February.

Ahonen, J. – Pyyhtiä, I. (1996) **Integrating Finland’s economy into the EU.** Bank of Finland Bulletin, May.

Koskenkylä, H. – Vesala, J. (1996) **The Finnish banking sector: performance ond future prospects.** Bank of Finland Bulletin, June–July 1996.

Pikkarainen, P. (1996) **Some perspectives on the principles of monetary policy with a floating markka.** Bank of Finland Bulletin, August.

Hämäläinen, H.T. – Vehmas, M. (1996) **Amendments to the Currency Act.** Bank of Finland Bulletin, August.

Finland joins the EU exchange rate mechanism. Bank of Finland Bulletin, October 1996.

Hämäläinen, S. (1996) **Finland and the EMU: some perspectives.** Bank of Finland Bulletin, November.

Lehtonen, M. (1996) **Fiscal policy and public finances.** Bank of Finland Bulletin, November.

Kuosmanen, H. (1996) **Experiences with reserves averaging.** Bank of Finland Bulletin, December.

Pikkarainen, P. – Suvanto, A. – Hukkinen, J. – Pyyhtiä, I. (1997) **Monetary policy in Finland, experiences since 1992.** BIS Policy papers No. 2, Monetary policy in the Nordic countries since 1992.

Lindgren, A. – Vehmas, M. (1997) **Revision of the Act on the Bank of Finland.** Bank of Finland Bulletin, September.

Vanhala, M. (1997) **Monetary policy in 1998.** Bank of Finland Bulletin, December.

Ollila, E. (1998) **EMU and the Finnish financial markets.** Bank of Finland Bulletin, March.

Peisa, P. – Vehmas, M. (1998) **Act on the Bank of Finland made compatible with Stage Three of EMU.** Bank of Finland Bulletin, June-July 1998.

Kontulainen, J. – Vehmas, M. (1998) **Changes in the reference rate system with the changeover to monetary union.** Bank of Finland Bulletin, December.

BANK OF FINLAND DISCUSSION PAPERS

ISSN 0785-3572, print; ISSN 1456-6184, online

1/2001 Risto Herrala **An assessment of alternative lender of last resort schemes.** 2001. 28 p. ISBN 951-686-701-4, print; ISBN 951-686-702-2, online. (TU)

2/2001 Esa Jokivuolle – Karlo Kauko **The new basel accord: some potential implications of the new standards for credit risk.** 2001. 23 p. ISBN 951-686-703-0, print; ISBN 951-686-704-9, online. (RM)

3/2001 Mika Kortelainen **Actual and perceived monetary policy rules in a dynamic general equilibrium model of the euro area.** 2001. 76 p. ISBN 951-686-705-7, print; ISBN 951-686-706-5, online. (TU)

4/2001 Martin Ellison **Stabilisation bias in monetary policy under endogenous price stickiness.** 2001. 20 p. ISBN 951-686-707-3, print; ISBN 951-686-708-1, online. (TU)

5/2001 Erkki Koskela – Rune Stenbacka **Equilibrium unemployment with credit and labour market imperfections.** 2001. 35 p. ISBN 951-686-709-X, print; ISBN 951-686-710-3, online. (TU)

6/2001 Jarmo Pesola **The role of macroeconomic shocks in banking crises.** 2001. 61 p. ISBN 951-686.713-8, print; ISBN 951-686-714-6, online. (TU)

7/2001 Anssi Rantala **Does monetary union reduce employment?** 2001. 36 p. ISBN 951-686-715-4, print; ISBN 951-686-716-2, online. (TU)

8/2001 Tuomas Välimäki **Fixed rate tenders and the overnight money market equilibrium.** 2001. 72 p. ISBN 951-686-717-0, print; ISBN 951-686-718-9, online. (TU)

9/2001 Morten L. Bech – Kimmo Soramäki **Gridlock resolution in interbank payment systems.** 2001. 34 p. ISBN 951-686-719-7, print; ISBN 951-686-720-0, online. (RM)

10/2001 Antti Ripatti – Jouko Vilmunen **Declining labour share – Evidence of a change in the underlying production technology?** 2001. 43 p. ISBN 951-686-721-9, print; ISBN 951-686-722-7, online. (TU)

11/2001 Michael Ehrmann – Martin Ellison – Natacha Valla **Regime-dependent impulse response functions in a Markov-switching vector autoregression model.** 2001. 24 p. ISBN 951-686-723-5, print; ISBN 951-686-724-3, online. (TU)

12/2001 Jenni Koskinen **Yksityisasiakkaiden maksuliikepalvelujen hinnoittelu Suomessa.** 2001. 46 p. ISBN 951-686-725-1, print; ISBN 951-686-726-X, online. (RM)

13/2001 Nico Valckx **Factors affecting asset price expectations: fundamentals and policy variables.** 2001. 42 p. ISBN 951-686-727-8, print; ISBN 951-686-728-6, online. (TU)

14/2001 Jan Annaert – Marc J.K. DeCeuster – Nico Valckx **Financial market volatility: informative in predicting recessions.** 2001. 21 p. ISBN 951-686-729-4, print; ISBN 951-686-730-8, online. (TU)

15/2001 Esa Jokivuolle – Samu Peura **A value-at-risk approach to banks' capital buffers: An application to the new Basel Accord.** 2001. 22 p. ISBN 951-686-731-6, print; ISBN 951-686-732-4, online. (TU)

16/2001 Juha-Pekka Niinimäki **Should new or rapidly growing banks have more equity?** 2001. 36 p. ISBN 951-686-733-2, print; ISBN 951-686-734-0, online. (TU)

17/2001 David Mayes – Matti Virén **Financial conditions indexes.** 2001. 31 p. ISBN 951-686-735-9, print; ISBN 951-686-736-7, online. (TU)

18/2001 Angela Huang – Dimitri Margaritis – David Mayes **Monetary policy rules in practice: Evidence from New Zealand.** 2001. 34 p. ISBN 951-686-737-5, print; ISBN 951-686-738-3, online. (TU)

19/2001 Erkki Koskela **Labour taxation and employment in trade union models: A partial survey.** 2001. 28 p. ISBN 951-686-739-1, print; ISBN 951-686-740-5, online. (TU)

20/2001 Maria Antoinette Dimitz **Output gaps and technological progress in European Monetary Union.** 2001. 29 p. ISBN 951-686-741-3, print; ISBN 951-686-742-1, online. (TU)

21/2001 Heiko Schmiedel **Technological development and concentration of stock exchanges in Europe.** 2001. 37 p. ISBN 951-686-749-9, print; ISBN 951-686-750-2, online. (TU)

22/2001 Oz Shy – Juha Tarkka **Stock exchange alliances, access fees and competition.** 2001. 37 p. ISBN 951-686-751-0; print, ISBN 951-686-752-9, online. (TU)

23/2001 Saarenheimo Tuomas **Should unemployment benefits decrease as the unemployment spell lengthens?** 2001. 27 p. ISBN 951-686-753-7, print; ISBN 951-686-754-5, online. (KT)

24/2001 Korhonen Kari **Securities market ATSs. Concepts, their roles and related policy issues.** 2001. 69 p. ISBN 951-686-755-3, print; ISBN 951-686-756-1, online. (RM)

25/2001 Tapio Korhonen **Finnish monetary and foreign exchange policy and the changeover to the euro.** 2001. 46 p. ISBN 951-686-757-X, print; ISBN 951-686-758-8, online. (KT)