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KORUNA EXCHANGE RATE TURBULENCE IN MAY 1997

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1 Introduction

This special working paper includes a careful examination of external relations and the accompanying adverse effects on the Czech economy, as well as an analysis of the root causes of the exchange rate turbulence in May 1997. In addition, this part will take an in-depth look at the attempts to solve the problem of turbulence, from the CNB strategy in the first days, the escalation, up to and including the changes in the exchange rate regime and the rationale behind these changes. The subsections to follow will concentrate on the eventual easing of the turbulence and the CNB's strategy aimed at interest rate landing.

In 1996, the problems of external relations in the Czech economy had reached serious proportions. As a result, the economy was placed in a more vulnerable position. The current account registered a high deficit, and financial flows on the capital account, as the currency band was widened, contributed to the nominal appreciation of the koruna (CZK). The Czech Republic was under the close scrutiny of foreign investors specialised in investments on emerging financial markets, because various comparison studies had shown that the external development of the Czech economy was ranked among the worst in the world.

Interest in the Czech economy from international financial organisations was triggered by the actual positive characteristics of the koruna. In fact, its convertibility has attracted foreign investors since 1995. During the period of transition, Czech financial markets had developed at a relatively fast pace, and a large number of foreign investors entered the koruna market. The share of trading among domestic banks and non-residents in the overall volume of exchange rate operations increased, and the role of forward operations strengthened. These factors, combined with various impulses, caused the exchange rate turbulence in 1997 to develop quickly and on a large scale.

From the end of 1996, resident foreign exchange deposits were rising slowly, and from February 1997, the koruna started to gradually weaken within the set currency band. A fall in the PX 50 index[1] corresponded to the fall in the koruna exchange rate. These were important warning signals that the potential for exchange rate turbulence existed and that the players on the Czech financial markets were beginning to notice very serious problems in the Czech economy. The actual timing of the exchange rate turbulence was driven by a series of impulses:

a) The vulnerability of the economy in the area of external relations had become more visible due to extensive coverage in the Czech media and opinions and viewpoints in various international studies. b) The first government "package" reacting to the problems of the external imbalance was not well received by the financial markets and was viewed as an inadequate assessment of the situation. c) Uneasiness on financial markets was supported by political unrest. d) An exchange rate crisis broke out in Thailand where the currency provided foreign investors with a rate of return strongly correlated to the koruna's return. Indicating possible investment risk for other emerging markets, contagion effects from the crisis began to spread.

On 15 May 1997, a sharp drop in the koruna exchange rate threw the Czech Republic into a cycle of turbulence and uncertainty. In the early morning hours, the exchange rate plunged briefly to 5% below parity. In the first days of the turbulence,

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1 The PX 50 index is the Prague Stock Exchange Index.

the CNB intervened on the foreign exchange and money market in order to preserve the currency band. This strategy provided a real opportunity for easing the tension on the foreign exchange market by promoting the calm exit of foreign investors from the koruna market through extended intervention and by maintaining the credibility of the currency band in hopes of preventing resident panic. At the beginning, it was not clear as to what extent the foreign exchange speculation would come from the side of non-residents, nor whether residents would contribute to the speculative attack.

Interventions on the foreign exchange market accompanied by an attempt to informally limit the liquidity of the Czech off shore market maintained the koruna exchange rate within the currency band. The central bank intervened on the money market with the intention of withdrawing the banking sector's liquidity. This action caused significant hikes in CNB interest rates and in turn led to an overall rise in interest rates and spreads on the market. The effectiveness of open market operations was strengthened by limited access to the Lombard credit.

The driving force behind the turbulence was the behaviour of non-residents who left the koruna market and launched speculative attacks against the koruna. However, it was the change in resident behaviour that actually led to the sharp escalation of the situation. Residents began converting large amounts of koruna into foreign currency and even began over-stocking imported goods. In all probability, residents contributed to the attack on the koruna as well. Interestingly, the media and economic specialists who continually predicted the fall of the koruna, strengthened the probability of profit from speculations, and in this way, contributed to the change in resident behaviour.

Escalation of the turbulence was an impulse for the CNB to rethink its strategy. The use of foreign exchange intervention over a long period of time was limited by the large volume of koruna transferred to foreign currency, i.e. there was a sharp decline in the CNB's foreign exchange reserves. During May 1997, approximately CZK 40 bn was converted into foreign currency. Experience has shown that informally limiting the liquidity of the external market is only a short-term instrument. Moreover, high interest rates and spreads accompanied by limited bank access to the Lombard credit, could have eventually caused the turbulence to leak over into the banking sector. This inherent threat led to an extraordinary meeting of the Bank Board on 25 May 1997 during which the Board had arranged to meet with the government the following day to decide the fate of the koruna exchange rate regime. No agreement, though, on introducing measures to support the existing exchange rate regime had been reached. On the evening of 26 May 1997, following this meeting, the Bank Board and the government announced their decision to adopt a new exchange rate regime. From this day on, the Czech koruna would be managed under a floating exchange rate with the deutschmark as the reference currency.

Relief from the exchange rate turbulence appeared in several stages. In the first stage, it was essential to stabilise the exchange rate and prevent any dramatic shock effect which, as seen in other countries, e.g. Mexico or Thailand, could develop as a reaction to the cancellation of the currency band. In this stage, the CNB applied a strategy composed of several measures allowing for smooth exchange rate movement without overshooting. During the period of turbulence, the CNB succeeded in maintaining the exchange rate within the currency band which made it possible to abandon the band at an advantageous position, i.e. 2% from the depreciation limit. Therefore, the market's adjustment of the exchange rate after the change in the regime was moderate. The CNB's announcement that in the near future the average koruna exchange rate should float in the range of 17-19.50 CZK/DEM helped stabilise the exchange rate. However, uncertainty on the real character of the new exchange rate regime was the price that was paid for publicising this information. From the end of May, CNB operations on the money market were carried out with the aim of maintaining a lower volume of liquidity than was demanded, for example, in comparison with the position of required reserves. Access to the Lombard credit continued to be closed. Hence, during the first stage of relief, interest rates on the money market remained high and unsteady. Wide spreads also contributed to the continuing uneasiness.

In June, the situation on the foreign exchange market eased up. The amount of foreign currency deposits no longer increased. In mid-June, pressure was put on the appreciation of the koruna, and the CNB absorbed the shock by purchasing foreign currency. As the second stage of relief began, the CNB concentrated on the consolidation of the money market and introduced its strategy of interest rate landing. This strategy of lowering reference rates (repo and Lombard) developed from the daily situation on the foreign exchange market: rates were lowered when there existed enough space for lowering them without any real risk of koruna depreciation. In mid-June, access to the Lombard credit was opened once again. These measures in turn gave rise to a gradual decline in rates on the money market and a reduction of spreads. The situation on the money market was complicated by the need to finance the state budget deficit. From the middle of June, operations by the Czech Ministry of Finance had exhausted a large volume of available liquidity making the CNB's target of gradually lowering interest rates more difficult. The discrepancy in state budget revenues and expenditures caused commercial bank portfolios to be restructured. Commercial banks increased their holdings of T-bills while reducing their holdings of CNB-bills.

The third stage of relief was associated with the completion of the consolidation process on the money market. It had taken another two months for interest rates and spreads to fall to the desired level. In July and August, exchange rate developments indicated a relatively calm situation. Only a few deviations called for CNB intervention on the foreign exchange market - occurring nonetheless in both directions, i.e. purchase and sale. There were some indications that in the new exchange rate regime, the foreign exchange market had been very sensitive to news on inflation and the trade deficit. For example, after publicly announcing favourable information on 22 July, the koruna exchange rate strengthened. This was additionally supported by the conversion of a large foreign loan into koruna on the domestic foreign exchange market. The exchange rate gradually strengthened, reaching the level of 18.65 CZK/DEM. The CNB used this time to repurchase foreign currency. Due to uneasiness from the expected unfavourable trade deficit results, the exchange rate gradually weakened in the second half of August. After more moderate deficit results were announced on Friday 22 August, the exchange rate strengthened for a short period of time. Nevertheless, in the last week of August, a slow weakening tendency had appeared once again.

A stable exchange rate allowed the CNB to continue in its strategy of lowering rates. The gradual lowering of the repo rate caused a slight drop in rates on the money market as well as the narrowing of spreads. Poor timing and structural management of the liquidity in the banking system and heightened uneasiness on the foreign exchange market before publicly announcing economic information caused occasional fluctuations in rates. In view of the fact that foreign currency intervention purchases and the cancellation of the import deposit increased the level of free liquidity in the banking sector, the volume of CNB sterilised operations grew.

The limit rate remained unchanged, and the volume of CNB-bills held by banks in repo rose. Moreover, the restructuring of bank portfolios continued. The banks transferred the bills from direct holdings to repo. During August, there were no CNB-bill auctions on the primary market.

At the end of August 1997, real interest rates converged to the pre-turbulence levels. CNB monetary policy was no longer limited by interest rate landing, and it was possible once again for monetary instruments to respond to the internal roblems of the Czech economy, especially inflation expectations.

2 The Root Causes

2.1 External Relations

In 1993-1996, the Czech Republic's trade balance and current account had succumb to the pressures of a growing disequilibrium. While in 1993 trade and payment relations were in balance, by 1996, the ratio indicators of the trade deficit and the current account deficit to GDP had reached extreme values by international standards (Chart 1). The share of capital inflow in GDP was also high (Chart 2), especially in 1995. The expanding current account imbalance had been visible since 1995 when the rate of the trade balance deficit significantly accelerated.

Worsening of the external disequilibrium in the area of the balance of trade was caused by a build-up of several factors from the import/export side: a. a high propensity to import during a period of economic growth, b. wages outpacing labour productivity growth, c. slowed economic growth on the main consumer markets, d. increased competition in Eastern Europe and Asia, e. real strengthening of the

koruna vis-a-vis most Western European currencies due to nominal strengthening of the dollar and slowed growth in international importer prices, and f. asymmetric access to foreign markets for Czech importers and exporters.

The capital account was characterised by surpluses that had cumulated in 1995. Moreover, the structure of capital flow significantly changed. From total capital flow, the share of debt capital gradually increased while non-debt capital (shares, share certificates, etc.) declined proportionately. The factors that led to the overall surplus in the capital account can be divided into the following periods:

1. Up to 1995, the influence of privatisation along with the massive entry of foreign entities into the Czech economy, relatively high demand in the banking and business sector for long-term resources (appearing at a time when there was a fixed exchange rate offering definite price advantages); 2. Up to March 1996, the existence of an interest rate differential leading to the inflow of short-term resources (after extension of the currency band, this factor temporarily lost any significance); 3. The end of 1995, after extended convertibility, the koruna took on a more attractive character, 4. Development of a domestic financial and capital market (the introduction of new financial products, development of a futures market) and Czech market integration into operations on international financial and capital markets, increasing, e.g. the volume of eurokoruna bond issue.

Changes in the capital inflow structure led to a worse debt status for the Czech Republic. As of 31 March 1997, total foreign debt in relation to GDP exceeded 42%. Increased indebtedness impaired the structure of financing for the current account deficit and caused greater economic vulnerability in securing foreign exchange liquidity.

2.2 The Koruna Becomes an Attractive Currency

In 1997, Czech banks (including subsidiaries and foreign branches), foreign banks outside the Czech Republic, and non-bank clients (both resident and non-resident) were the main operators on the foreign exchange market. The share of clients in trade was relatively low and in the case of derivatives, was just above 10%.

The share of clients in spot trades was even lower, and in volume, represented approx. 9.3%.

Thanks to macroeconomic and political stability and the gradual liberalisation of the current account and a large part of the capital account, the Czech koruna gradually became a more attractive, convertible currency. Market liquidity increased, and in April 1997, the average daily volume of trade was roughly 3.4 times higher than April of last year for spot trades and 8.4 times higher for forward and swap trades (Charts 3 and 4). There was a noticeable currency preference for transactions on the spot and forward market. CZK/USD transactions were the most common, followed by CZK/DEM and USD/DEM. The growing share of forward operations indicated that the koruna market had very quickly caught up with developed markets in using derivatives.

Although during the turbulence period the koruna market was relatively narrow compared to the main international currencies, it was significantly more advanced than the markets of other countries in the region (see Tables 1 and 2). The koruna was also attractive for financial investors due to an extremely liberal foreign exchange regime. Moreover, economic entities had not experienced this much turbulence on the foreign exchange market since the beginning of reform[2], so the expected exchange rate and interest rate risk was low. By 1997, the koruna market had sufficient liquidity and was capable of trading in all the main instruments, including derivatives. Since 1995, a large portion of the market has gradually shifted abroad. Charts 5 and 6 show the increasing share of transactions with foreign bank participation. London had become the most significant foreign financial centre trading in Czech koruna.

After introducing the currency band for the koruna in February 1996, the koruna steadily strengthened (Chart 7), due in part to an interest rate differential from approx. mid-June 1996 to mid-February 1997 (Charts 8 and 9). This differential allowed investment banks to easily sell korunabonds to small investors, because bonds were issued by quality issuers[3] (with good agency ratings) and with double

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2 With the exception of a short period of turbulence after the extension of the currency band in February 1996.

3 The issuers were from the Czech Republic which has been an OECD member country since 21 December 1995.

digit interest rates. When comparing the volume of issued eurobonds (Chart 10) to the exchange rate of the koruna, clearly the koruna was the strongest during the period of the highest increase in koruna eurobond issue. This time coincidence supports the hypothesis that international financial markets significantly influence the koruna.

Table 1
Trade volume on exchange rate markets - emerging market currencies
By instrument - April 1996 (USD bn)

Currency	Total	Spot	Forward & swaps
Asia			
Indian rupee	2.0	1.1	0.9
Indonesian rupiah	7.8	4.3	3.5
Korean won	5.0	4.1	0.9
New Taiwan dollar	4.5	3.1	1.3
Thai baht	4.9	2.2	2.7
Latin America			
Argentine peso	2.2	2.1	0
Brazilian real	5.5	5.3	0.2
Chilean peso	1.0	0.8	0.2
Colombian peso	0.2	0.2	0
New Mexican peso	2.2	1.9	0.3
Europe			
Czech koruna	3.9	3.4	0.4
Polish zloty	1.6	1.5	0.2
Russian rouble	4.1	3.5	0.6
Slovak koruna	0.2	0.2	0
Other			
South African rand	6.3	2.9	3.3
Saudi Arabian riyal	2.4	1.1	1.3

Source: central banks, BIS

Table 2
Foreign exchange trade volume - emerging market currencies
(USD bn)

Currency	Domestic trades[1]		Global trades		
	April 1995[2]	April 1996[2]	March 1996[2]	April 1997[2]	beginning 1996[3]
Asia	>13.6	>17.5	>16.3	>39.4	36.6
Indian rupee	1.6[4]	1.2	1	n.a.	1.1
Indonesian rupiah	4.6[4]	7.8[4]	3.5	10	8.5
Korean won	3.1	3.2	1.9	2.4	2.4
Malaysian ringgit	n.a.	n.a.	5	10	9.5
New Taiwan dollar	1.5	1.6	n.a.	3	1.1
Thai baht	2.6[4]	4.0[4]	5	14	14
Latin America	9.1	10.9	>5.8	n.a.	
Argentine peso	1.7	2	n.a.	1.5	
Brazilian real	4.3[5]	5.5[5]	4.5	n.a.	
Chilean peso	0.8	0.9	n.a.	1.5	
Colombian peso	0.4[4]	0.1[4]	0.1	n.a.	
New Mexican peso	2.1	2.2	1.2	n.a.	
New Peruvian sol	0.1	0.2	n.a.	n.a.	
Europe	1.8	>5.9	>1.6	8.1	
Czech koruna	0.6[4]	2.5[4]	0.5	5.5	
Hungarian forint	0.3	0.6	0.3	0.4	
Polish zloty	0.3[4]	n.a.	0.3	0.4	
Russian rouble	0.6	2.6	0.5	1.4	
Slovak koruna	0.02	0.2	n.a.	0.4	
Other	5.4	6.7	>7.4	>7.0	
New Israeli shekel	0.3	0.5	n.a.	n.a.	
Saudi Arabian riyal	1.4	1.5	0.3	n.a.	
South African rand	3.7	4.7	6	6	
Turkish lira	0.01[4]	0.02[4]	1.1	1	
Total[6]	>29.9	>41.3	>31.1	>56.1	

Source: central banks, BIS

[1] Central bank estimates

[2] Citibank estimate

[3] Estimate: *Singapore Foreign Exchange Market Committee Annual Report 1996.*

[4] Gross volume

[5] Including other currencies

[6] The publication *Central Bank Survey of Foreign Exchange and Derivatives Market Activity 1995* a gives total volume of USD 1,136.9 bn.

3. The Immediate Causes of the Exchange Rate Turbulence

Increasing economic vulnerability in the area of external relations was triggered by the gradual weakening of the koruna which started in the second half of February 1997 (Chart 7) and an increase in foreign currency deposits by residents, especially physical entities (Charts 11 and 12). Both of these factors indicated that expectations of a weakening koruna were growing and that foreign investors and residents had already begun to take the problems in the Czech economy seriously. In spite of this, the koruna market operated until 14 May 1997 without any significant turbulence, and the money market experienced smooth interest rates and a narrow, stable spread (the spread between the PRIBOR and PRIBID rates). The foreign exchange market also operated without any intervention from the CNB.

The actual timing of the turbulence was directly linked to several events. The foreign exchange crisis in Asia increased foreign investor sensitivity to potential risk and was, in fact, the motivating force that led investors to exit other emerging markets. In addition, bad news, especially stemming from unstable political developments in the Czech Republic, convinced the players on the market that the economy was vulnerable and that the probability of profit from exchange rate speculation against the koruna was high. Speculators expected panicky residents to join in on the attack on the currency and in turn bring down the koruna exchange rate with their purchases. With the help of the media and some economic specialists who continually predicted the fall of the koruna and also recommended devaluation as an appropriate solution to the economic problems, the involved financial institutions deliberately strengthened the probability of their exchange rate profit.

A wide range of negative information had been publicised on the high current account deficit, its growth rate, as well as decelerating economic growth and a worsened state budget deficit. In addition, insufficient capital market regulation on the side of foreign investors was repeatedly a subject of criticism. Discussions were in progress between the government and the central bank on the level of monetary policy restriction. These discussions helped in making the external imbalance visible and therefore, increased uneasiness on the market. During this period of political tension, the government had approved the first "package" of economic measures for correcting economic policy, with stress on the external sector. The adopted measures, though, were not well received in the Czech Republic nor abroad.

The first warning signals of the serious weakening of the koruna appeared around 13 May 1997 in connection with the foreign exchange crisis in Thailand. In the already tense situation, the Thai exchange rate crisis was the foreign investors' cue to reassess their investments in the Czech economy and to launch speculative attacks on the depreciation of the Czech koruna[4].

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[4] Both the Czech Republic and Thailand belong to the group of "emerging markets". In addition, as reported in a study conducted by J.P. Morgan, investors had decided to exit the market on the basis of a strong correlation between the rate of return for the Thai baht and the koruna (in contrast to other currencies in the group of emerging markets).

4 The May 1997 Turbulence

4.1 The Onset

A sharp drop in the koruna rate from 3.8% to 4.8% below parity during one hour accompanied by conjecture on short-selling[5] from American hedging funds forced the CNB to employ extensive foreign exchange intervention on 15 May 1997. In half an hour, the CNB had managed to pull the koruna back up to 3% below parity, and the exchange rate was stabilised between 3 - 3.8% below parity.

[5] Koruna are borrowed and converted into foreign currency (putting pressure on koruna weakening). After the koruna weakens, exchange rate profits are achieved through repurchasing.

4.2 CNB Measures During Turbulence

In the first days of turbulence, the CNB intervened on the foreign exchange and money market in order to preserve the currency band. This strategy provided a real opportunity for easing the tension on the foreign exchange market by promoting the calm exit of foreign investors from the koruna market through extended intervention and by maintaining the credibility of the currency band in hopes of preventing resident panic. At the beginning, it was not clear as to what extent the foreign exchange speculation would come from the side of non-esidents, nor whether residents would contribute to the speculative attack. Intervention on the foreign exchange market accompanied by an attempt to informally limit the liquidity of the external market (i.e. off-shore) maintained the koruna within the currency band. In order to guard against short-selling, the central bank employed tactics of non-sterilised foreign exchange intervention based on foreign exchange intervention and withdrawing repo tenders aimed at retracting as much liquidity as possible. Reducing the volume of koruna liquidity limited the probability of attack against the koruna during turbulence.

From the very first day of turbulence, the CNB substantially raised its reference rates (Lombard and repo rates). As a result, there was an extreme hike in the rates of all maturities (see Table 3). Uneasiness on the market also led to a dramatic widening of spreads (Chart 13). In accordance with a Bank Board decision, repo operations were supported by the limited opportunities for using the Lombard credit. The limit repo rate was gradually raised to as high as 75%, and access to the Lombard credit was completely closed. The CNB took an additional measure asking commercial banks to informally limit non-resident access to the koruna. Experience with limiting external market liquidity in this way has indicated that the effectiveness of informal requests as these is short-term.

Chart 13

In the days to follow, the money market became very volatile and lacked liquidity. Some of the reference banks stopped quoting, and market participants widened the spreads as a result of uncertainty on the future development of interest rates and the foreign exchange market. Market liquidity for the koruna was affected by the settlement of foreign currency purchases by commercial banks on the foreign exchange market, the end of the reserve requirement cycle and high bank demand for short-term funds. CNB efforts to minimise the supply of free liquidity in the banking sector could be seen in the gradual decline of cumulative free reserves.

4.3 The Escalation

During the period of turbulence, the configuration of players and the type of operations on the foreign exchange market were gradually changing. During escalation, several types of operations had accumulated from the side of residents and non-residents. These operations had a direct effect on the depreciation of the exchange rate. The change in the foreign exchange position of the banking sector was not significant in the first days of turbulence, and for this reason, it can be assumed that the banking sector did not have any immediate effect in initiating the turbulence. In all probability, it involved short-selling and the sale of koruna assets by non-residents. This has been documented by the developments of non-resident koruna credits and deposits (Chart 14) indicating the koruna short-term assets and liabilities of non-residents. Available data do not clearly indicate the pivotal role of residents in the first day of exchange rate turbulence. It is even possible that residents had later joined in on short-selling. The unstable development of resident credits and deposits is also comparable to non-resident trends (Charts 14 and 15), but with residents, there was a lag of several days. In any case, residents reacted to the news with massive purchases of foreign currency. The dramatic rise in foreign currency deposits has been documented in Charts 11 and 12. Escalation of the turbulence caused increased pressure on the trade balance deficit, because residents started stocking up on imported goods. Interestingly enough, the volatility of the foreign exchange market could have been temporary increased by the non-standard balance of foreign exchange trading caused by a holiday on the US market (Monday, 26 May). The standard term for settlement is the second working day. In this particular case, the market players knew in advance that they would be able to trade on the market at the same rate for two consecutive days[6].

4.4 The Change in the CNB's Strategy

Escalation of the exchange rate turbulence led to re-evaluation of the CNB strategy. While the immediate cause of the turbulence was the behaviour of non-residents who exited the koruna market and speculated against the koruna, it was residents who actually escalated the situation by converting large amounts of koruna

[6] This knowledge could, to a certain extent, facilitate attacks on the koruna, because for short-term (i.e. two-day) speculation, borrowing domestic currency was not needed, and there was no exposure to high koruna rates.

into foreign currency and by stocking up on imported goods. In all probability, residents also joined in on the speculative attack against the koruna.

In May 1997, entities had converted approximately CZK 40 bn into foreign currency. Resident legal entities converted roughly CZK 23 bn, and their foreign exchange deposits had risen from CZK 32 bn to CZK 55 bn. The foreign exchange deposits of non-resident legal entities remained at the original level, approx. CZK 6 bn. The foreign exchange deposits of resident physical entities rose by 15 bn from CZK 48 bn to 63 bn. Non-resident physical entity deposits slightly increased from CZK 8 bn to CZK 9 bn. In addition, client foreign exchange credits granted by banks showed insignificant growth from CZK 13 bn to around CZK 14 bn. The repatriation of investment by some foreign investors amounted to approx. CZK 13 bn. Foreign exchange assets increased at an adequate pace to CZK 53 bn due to a foreign exchange transfer from the central bank by way of foreign exchange intervention.

After a week, it was clear that a reversal in exchange rate expectations was not possible. On the contrary, the uneasiness caused by non-residents on the foreign exchange and capital market spread to residents and even to the goods market. Although gradual implementation of monetary policy instruments had always succeeded in reversing the fall of the koruna, this strategy could never be a long-term solution. The market, in fact, was well aware of the time limitations for these measures.

The use of long-term foreign exchange intervention was limited by the impact of non-sterilised interventions on the money market and by the large volume of koruna converted to foreign currency which significantly reduced the level of CNB foreign exchange reserves. Experience with informally limiting the liquidity of the external market indicated that it involves an instrument with short-term effectiveness. Moreover, high rates and limited bank access to the Lombard credit, if implemented over a long period of time, could trigger a banking crisis. The threat of this development led to the extraordinary meeting of the Bank Board on 25 May 1997. During the meeting, the board agreed to meet with the government the following day to discuss the fate of the koruna exchange rate regime. On the evening of 26 May 1997, the Bank Board and the government announced their decision to change the exchange rate regime.

5 The Post-turbulence Period

5.1 The End of May 1997: Stabilisation of the Exchange Rate

On 27 May, the first day after abandoning the currency band, the CNB's strategy on the foreign exchange market consisted of moderate interventions for setting the CZK/DEM rate for trading. The exchange rate settled at 19.50 CZK/DEM. As part of the announcement on the change in the exchange rate regime, the CNB also stated that the average koruna exchange rate should float between 17-19.50 CZK/DEM. This announcement had a definite effect on the stabilisation of the exchange rate. Although this announcement, along with declaring the DEM as the reference currency, provided a rather ambiguous conception of the real character of the new exchange rate regime, it had more than likely prevented exchange rate overshooting in the first days.

By the end of May, CNB money market operations were implemented with the aim of maintaining a lower level of liquidity in the system than would be needed for meeting reserve requirements. The discount rate was raised to 13% (see Table 4), and access to the Lombard credit remained closed. This measure along with the adjustment of foreign currency purchases by commercial banks during CNB intervention, caused a significant reduction in liquidity.

In order to ensure a well-functioning payment system and to maintain the required level of reserves in the system, the CNB introduced O/N repo tenders for supplying liquidity at the end of the month. On 28 May, average repo rates rose to as high as 164.9% and to the end of May, there were no substantial drops in this level. Short-term interest rates were very unstable, though, sustaining their upward trend. In the last ten days of May, spreads between the PRIBOR and PRIBID rates widened even more due to uncertainty and a lack of liquidity on the money market. As of 30 May, 1W and 2W rates were 44%, 1M 31%, 3M 16% and at the longer end of the yield curve around 8-10%. Due to efforts on the part of banks to maintain at least short-term liquidity (i.e. an aversion to borrowing funds), the O/N rate spread had experienced the highest increase, rising to as high as 56%.

5.2 June 1997: Interest Rate Landing

At the beginning of June, the situation on the foreign exchange market eased up. The level of deposits for physical entities in foreign currency had stabilised by 6 June, while legal entity deposits followed on 16 June (see Charts 11 and 12). On the basis of a Bank Board decision, the repo rate was gradually lowered starting on 6 June (see Table 4). The strategy of rate lowering developed from the daily situation on the foreign exchange market: rates were lowered when there existed enough space for lowering them without any real risk of koruna depreciation.

Several factors were involved in stabilising the money market: the gradual lowering of the CNB limit repo rate, negative developments in the current state budget performance, and renewed access to the Lombard credit on 12 June. The partial reverse effects of these factors were reflected in the day-to-day development

of interest rates on the interbank deposit market and short-term bond market. The situation on the money market was mainly complicated by the need to finance the state budget deficit. (in compliance with the legal deficit limit of CZK 16 bn). In spite of the large volume of operations announced by the CNB and financed by the Ministry of Finance, there was a freeze on expenditures, and they could only be freed up to the amount of available revenue.

On 16 June, the Minister of Finance ended the freeze on state budget expenditures and the deficit was covered by the sale of T-bills above the legally permitted limit. This decision caused an irregular rise in the volume of T-bills for covering current performance. Operations by the Czech Ministry of Finance had exhausted a large volume of available liquidity making the CNB's target of gradually lowering interest rates more difficult. In several cases, it was necessary to neutralise operations for the Ministry of Finance by injecting liquidity into the system. The higher coverage of the discrepancy in state budget revenues and expenditures caused restructuring of commercial bank portfolios. As a result, commercial banks substantially increased their holdings of T-bills while reducing their holdings of CNB-bills and repos.

Due to the reverse effects of the factors mentioned above, PRIBOR rates in June were relatively unstable. From an overall standpoint, though, these rates were declining. The most significant changes in the level of interest rates were connected to the lowering of the CNB limit repo rate at the beginning of June (1-13 June) This rate was lowered from 75% to 45% and later to 39%, 31%, and 29%. Interest rate drops on the money market were the steepest for shorter maturities, virtually mimicking repo rate development: -55% for 1W, -49% for 2W and -30% for 1M. The decrease for 3M rates and above was less in relation to the overall lower rate level: -11% for 3M, and for 3M to 12M, the decrease was in the range -5.4% to -2.8%.

The PRIBOR's declining trend was temporarily offset on 17 June by the Ministry of Finance's decision to end the state budget expenditure freeze. All maturities recorded steady increases (1W +3.35% and 2W +1.78%, increases for 1M to 12M remained below 1.5%). Commercial banks counted on high demand for money from the Ministry of Finance and maintained rates relatively high. 1W and 2W rates remained nearly 4% above the repo rate, and during the week, other maturities stagnated or slightly rose. After several days, this situation stabilised, and in the period of 20-25 June, a drop in the level of interest rates occurred once again. In spite of this, there was uneasiness on the market due to heightened non-resident activity, causing practically all the rates to rise again on 26 June. This growth tendency lasted until the end of the month for all maturities.

In addition to the slow interest rate decline during June, the PRIBID/PRIBOR spread also narrowed. After the first days, there was a drastic change in the shorter maturities in connection with their quick decline. Following the initial high rates (approx. 20% up to 3M), the spread fluctuated in mid-June between 5-8% for all maturities. However, by the end of the month, it kept within the interval of 2.3-2.73%.

In the second half of June, pressure was put on the appreciation of the koruna. This pressure was then eased by central bank foreign currency purchases. The information available indicated that one reason for this could have been the drop in legal entity foreign exchange deposits allegedly caused by the complete inaccessibility to or high prices for koruna resources. For non-residents, a reduction in short-term koruna liabilities vis-a-vis the banking sector had occurred up to approx. 15 June, as well as in their koruna liabilities up to 23 June.

5.3 July and August 1997: Consolidation

In July and August, exchange rate developments indicated a relatively calm situation. Only a few deviations called for CNB intervention on the foreign exchange market - occurring nonetheless in both directions, i.e. purchase and sale. In the early evening hours of 9 July, the exchange rate of the koruna started to weaken due to foreign currency purchases by foreign banks. The following morning (10 July), the koruna experienced a swift turn from 18.50 to 18.64 CZK/DEM. This weakening trend continued and by the end of the week reached the level of 19.00 CZK/DEM. After announcing the initial estimate of material damage caused by the floods in Moravia, the exchange rate dramatically weakened on 11-12 July. On Monday 14 July, the exchange rate started again to sharply weaken, and as a result, intervention sales in DEM took place stabilising the koruna at 19.05 CZK/DEM. The koruna again weakened on 17 July, pushing the exchange rate down to 19.16 CZK/DEM. Intervention sales were repeated, and the koruna stabilised within the range 19.12-

19.14 CZK/DEM. No changes had occurred the following day. Renewed weakening on 21 July was caused by expectations of publicising the trade balance results, bringing the exchange rate down to 19.20 CZK/DEM.

After publicly announcing favourable trade results on 22 July, the koruna exchange rate strengthened, reaching the level of 18.65 CZK/DEM on 25 July. The CNB used this time to repurchase foreign currency. At the end of July, the foreign exchange market was characterised by a lack of activity and trade at a minimum. In the first half of August, the koruna slightly strengthened. The foreign exchange market's liquidity was low, and long positions were liquidated. The CNB once again used this opportunity to purchase foreign currency. Due to uneasiness from the expected unfavourable trade deficit results, the exchange rate gradually weakened in the second half of August. After more moderate deficit results were announced on Friday 22 August, the exchange rate strengthened for a short period of time. Nevertheless, in the last week of August, a slow weakening tendency had appeared once again.

Money market developments in July can be divided into three phases. First, in the period of 1-9 July, the settlement of foreign currency purchases along with a high volume of paid repos allowed the CNB to cut repo rates to as high as 16.20% for withdrawing operations. The gradual reduction of repo rates (for withdrawing and injecting liquidity) was reflected in the drop and the eventual stabilisation of PRIBOR rates for all maturities. As interest rates fell, the spreads between the PRIBOR and PRIBID also narrowed. Occasional interest rate fluctuation in this phase was caused mainly by inadequate time and structural management of liquidity in the banking system.

In the second period, 10-21 July, DEM intervention sales occurred several times because of the swift weakening of the exchange rate. At the same time, larger purchases of CZK by non-residents occurred on the koruna market. This had caused the level of interest rates to increase and spreads to widen once again. This rise was relatively dramatic, particularly on Friday 11 July: more than 5.5% for 1M, approx. 4% up to 3M, rates on the longer end of the yield curve rising the least, approx. 1.6% for 12 M. On 11 July, the situation on the koruna market eased up after the CNB Governor announced that the central bank would not prevent any changes in the exchange rate by raising interest rates. The market's acceptance of this situation led to slower drops in interest rates for the remainder of the period. A fall in rates was supported by another cut in the repo rate for withdrawing CNB operations by 0.20% to 16%.

In the third period, 22-31 July, strengthening of the koruna and a high surplus of liquidity created space once again for lowering the repo rate to 14.90%. In addition to the repo rate, the PRIBOR rates for all maturities also dropped, and the PRIBID/PRIBOR spreads narrowed again as well. The month-on-month changes in selected rates were: 1W -3.67%, 2W -3.73%, 1M -3.86%, 3M -3.41%, 6M -2.43%, and 12M -1.73%.

As in June, the situation on the money market in August was characterised by reductions in the repo rate (4 August to 14.50%) and positive developments on the foreign exchange market. Also, the PRIBOR rate dropped for all maturities. Intervention purchases of foreign currency raised the level of free liquidity in the banking sector, and the volume of CNB sterilised operations rose. In an effort to more evenly distribute the volume of repo operation payments, at least within two weeks, as of 12 August, the CNB started to announce only the 2W repo tenders. This was aimed at limiting the accumulation of payments on specific days only. The limit rate remained unchanged. The drop in rates was temporarily interrupted in the middle of August by uneasiness on the market stemming from publicising information on the trade balance. After the results were announced, the financial market stabilised and rates started to gradually fall once again. This trend was supported by keeping the repo rate's level intact.

On 15 August, there was a relatively sharp rise in rates, especially for 1M to 6M rates, and therefore this trend was interrupted. Uneasiness prevailed on the koruna and foreign exchange market. In the shadow of the expected unfavourable information on the July trade balance, non-residents picked away at the koruna market. As a result, on 18 August a sharp rise in rates had occurred, particularly for maturities of 6M and above, and on the short end of the yield curve, there was a two-day decline. On Thursday 21 August, during the announcement of the balance of payment results in the early evening, the PRIBOR rate for all maturities had risen by 0.19% - 0.57%. Panic on the market though did not escalate due to the fact that the CNB did not change the repo rate when announcing the withdrawal of the tender.

On 22 August, a drop occurred once again and was especially visible in shorter maturities. This was more than likely connected to the lower than expected deficit for July (13.77 bn in contrast to the predicted 16 - 20 bn). The spread for 1W - 12M achieved in average terms 0.28%. In contrast to July, this represents a drop of 1.42%. Nevertheless, the yield curve possessed a negative decline, and the PRIBID/PRIBOR spread continued to narrow during August. In average terms, all maturities floated between 0.5 - 0.56% (only for O/N, 6.5%), and 12M had recorded the highest rate. In contrast to July, the PRIBID/PRIBOR spread narrowed by 1.4% in average terms.

In the environment of relatively calm developments on the foreign exchange market, consolidation of the money market had taken roughly two months to complete. After the process of lowering interest rates and spreads had come to an end in August 1997, CNB monetary policy was no longer limited by rate landing, and it was again possible to start responding to the internal problems in the Czech economy, especially inflation expectations.