

# The Czech experience with capital flows: challenges for monetary policy

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## 1. Introduction

Capital flows are a crucial factor in macroeconomic and monetary development. Especially in a small open economy, they usually have a direct and sizeable impact on the exchange rate and, through it, on inflation, competitiveness and economic growth. Should the overall macroeconomic framework become internally inconsistent, capital flows become a typical channel through which the necessary correction materialises. They thus constitute both the channel through which a given macroeconomic setting could be damaged or undermined and a useful adjustment mechanism of re-establishing the economic order.

In this paper, we discuss the experience of the Czech economy with capital flows since the beginning of its transformation, which started in 1991. We deal with three different periods characterised by substantial volumes of capital flows with significant implications for the way monetary policy was implemented. Three different developments were occurring within different macroeconomic frameworks, thus having different monetary policy implications. Namely, we deal with: (1) the period 1991–95, when the fixed exchange rate and monetary targeting were maintained; (2) 1996–99, when the Czech National Bank (CNB) widened the fluctuation margin for the koruna and when a speculative attack ultimately led the CNB to abandon the fixed exchange rate regime, with negative implications for exchange rate volatility; and (3) 2002–03, when the CNB, against the background of a steady appreciation trend, faced an appreciation bubble and its subsequent burst. We also briefly discuss a potential future challenge for monetary policy consisting in a high share of repatriated profits in the current account deficit. This is followed by some remarks concerning the period from March to summer 2007, when the Czech foreign exchange market was influenced by “carry trades”. Finally, we summarise the Czech experience with capital flows and derive some lessons.

## 2. Capital flows under the fixed exchange rate regime: 1991–95

### 2.1. Macroeconomic and monetary background

#### 2.1.1. *Beginning of economic reform and split of the former Czechoslovakia*

Economic reforms in the Czech Republic started in 1991 after the collapse of the former centrally planned system and the disintegration of the former CMEA trade regime. Initial reform steps involved: (a) the devaluation of the Czechoslovak koruna in several steps and its fixing vis-à-vis a basket of five currencies; (b) the introduction of so-called internal convertibility of the koruna (see below); (c) the liberalisation of prices; and (d) the liberalisation of foreign trade. In the initial phases of the economic transformation, direct

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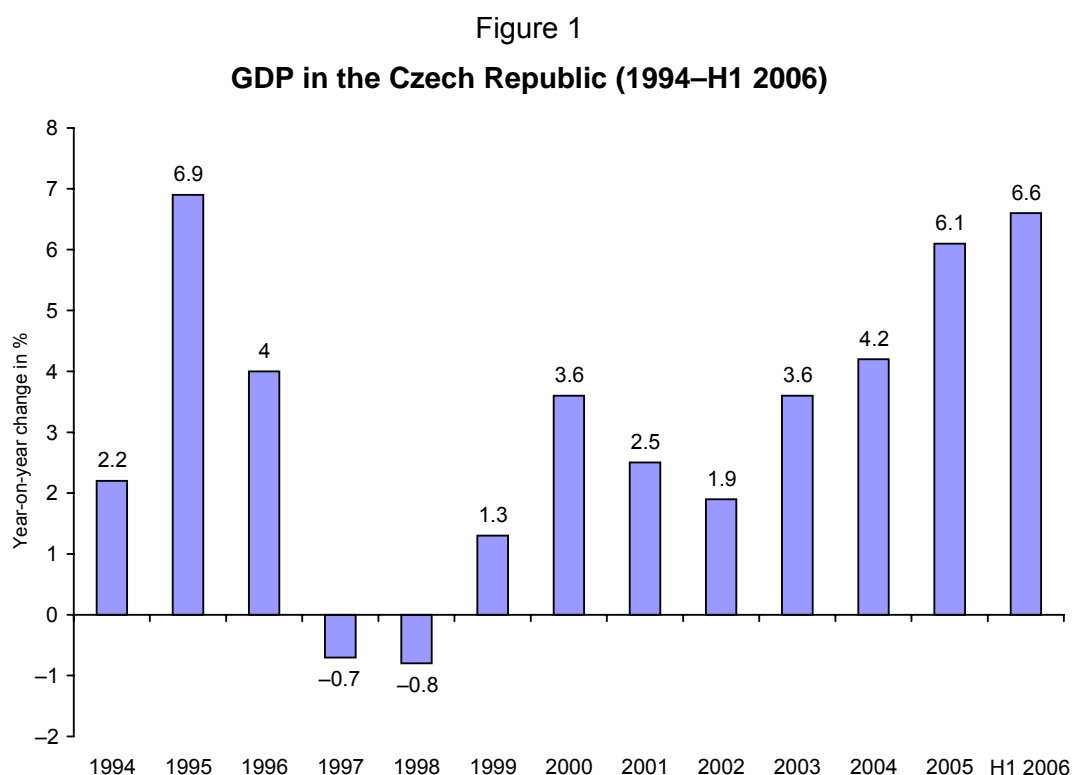
<sup>1</sup> Vít Bárta did final editing and made important contributions to a previous version of the article, which was based on Luděk Niedermayer’s presentation at a workshop of the National Bank of Romania at the end of 2006.

policy tools were frequently applied, but these were phased out and replaced by indirect market-conforming measures.

As in other transformation economies, output dropped substantially during 1991–92, but started to recover afterwards. During this period, the privatisation process started with the aim of generally overhauling property rights in the economy. In 1992, a general tax reform introduced a market-conforming tax structure. After the split of former Czechoslovakia, the Czech Republic came into being in January 1993 and the Czech koruna in February. In subsequent years, the economy recovered and embarked on a path to accelerated growth.

### 2.1.2. Overheating and the emergence of external imbalance

At first sight, the Czech economy was reasonably healthy<sup>2</sup> in the mid-1990s. Economic growth reached almost 7% in 1995 (Figure 1), unemployment was around 4% and inflation was around 9% and stable.



Source: Czech Statistical Office.

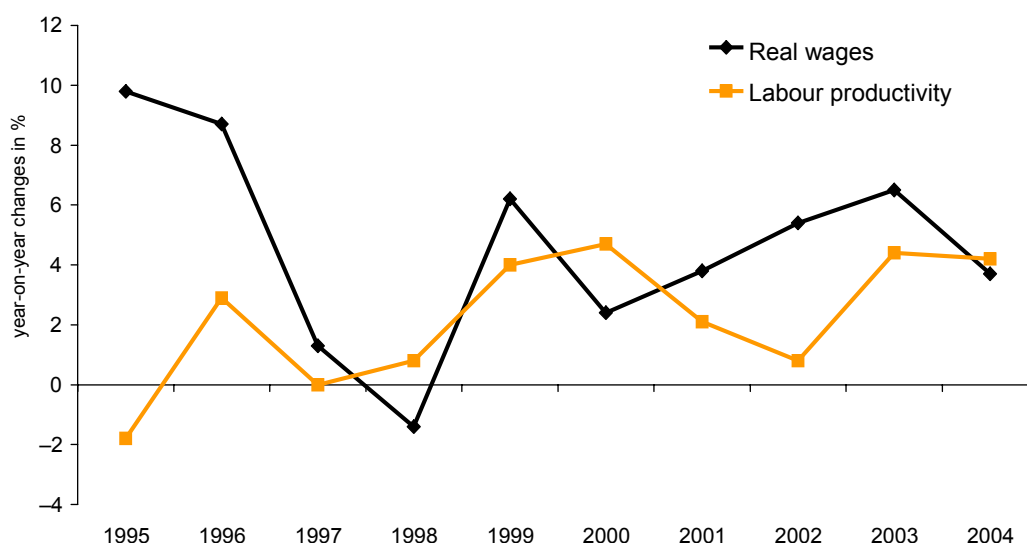
As mentioned above, the exchange rate was fixed with the currency peg delivering much needed stability to the economy. The overall prospects were considered quite promising.

However, a closer look showed worrying signs of demand overheating. Growth in real wages was exceeding productivity growth, and the gap between both variables reached almost 12 percentage points in 1995 and was still substantial in 1996 (Figure 2).

<sup>2</sup> The problems of the Czech economy during the 1990s related to the inadequacy of its institutional framework, the weakness of its law enforcement mechanisms and the consequences of delayed privatisation of the banking sector are not discussed in this paper. However, there is no doubt that they negatively influenced the performance of the economy during the second half of the 1990s.

Figure 2

**Real wages and labour productivity in the Czech Republic (1995–2004)**



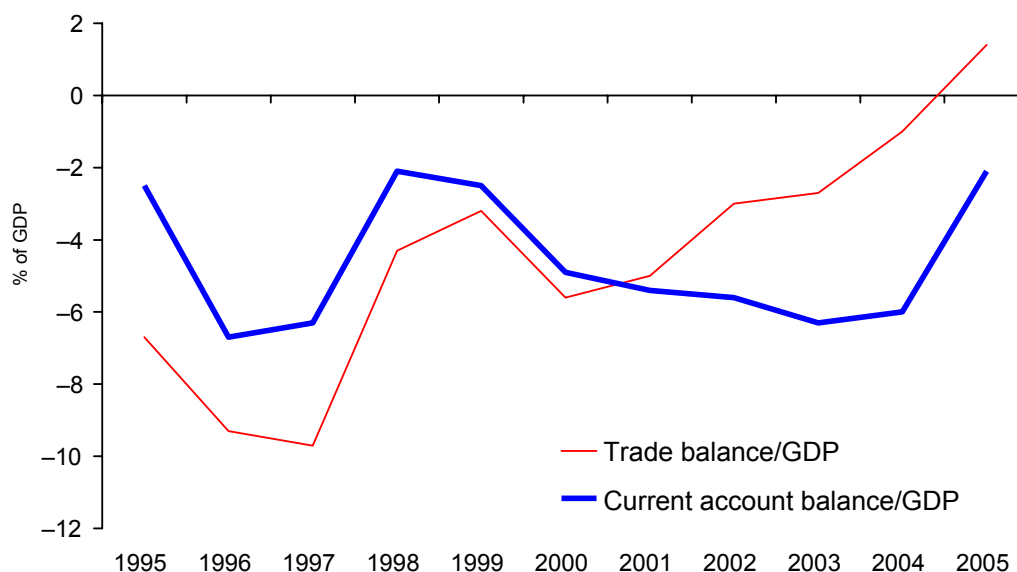
Source: Czech National Bank.

An unfavourable relationship also existed between domestic demand and supply. Stimulated by the fast growth of wages, household demand started to boom and loans to the newly fledged private sector expanded robustly. This was partly a consequence of what has been called “banking socialism”: government expenditures were directed towards large infrastructure projects (many of them in the area of environmental protection) with typically low returns. Also, private investments recovered after the decline during the transformation recession. The investment boom which took place during 1995–96 implied an exceptionally high ratio of gross fixed capital formation to GDP.

The resulting mismatch between domestic demand and supply led to the emergence of an external imbalance: the current account deficit reached 6.6% of GDP in 1996 and 6.2% in 1997 (Figure 3), thus exceeding the level generally considered critical (5% of GDP).

Figure 3

**Trade and current account balance/GDP (1995–2005)**



Source: Czech National Bank, own computations.

Unfortunately, the macroeconomic policies at the time did not respond to mounting external imbalances. The overheating was partly (and mistakenly) considered as the correction of previous economic decline. In addition, policymakers believed that the performance in the mid-1990s reflected the strengths of the newly formed market economy. Overall, there was insufficient understanding of the risks related to a continuing fixed exchange rate regime. The consequences of this neglect became obvious when capital flows started to play a more important role.

## **2.2. Capital account liberalisation: an invitation to capital inflow**

### **2.2.1. From internal to external convertibility in five years**

The internal convertibility of the koruna introduced at the beginning of 1991 was based on the following elements:<sup>3</sup>

- free access of domestic firms to convertible currencies used for trade transactions
- obligatory sales of foreign currencies obtained as export revenue
- limited access of households to foreign currencies used for individual tourism

These measures were adopted to cope with the very low level of foreign exchange reserves with which the Czechoslovak (Czech) economy was starting its economic transformation. In other words, in the light of this low endowment with reserves, internal convertibility was the only way to maintain the currency peg.

While the approach to current account transactions was relatively liberal, capital account transactions were more strictly regulated, especially on the outflows side. Although repatriation of investment gains (profits, dividends and interest payments) was guaranteed, free outflow of short-term portfolio investment by residents was restricted. Some other capital account transactions (both outflows and inflows) were either explicitly forbidden or subject to a licence system (see Dědek (2000) for more details). A general reason for different outflow restrictions was to stimulate inflows of FDI (to support the restructuring and privatisation of the government-owned sector) and portfolio investment (to support the development of the capital market). The inflow of bank credit was also welcomed due to the fear that domestic banks were unable to meet the requirements of the under-invested and growing economy.

Although the Foreign Exchange Act remained unchanged for several years, the overall legal environment and everyday practices were developing towards much higher capital mobility. An important interference with the desired framework stemmed from bilateral agreements on the protection of foreign investments. These international agreements were superior to domestic legal norms and thus undermined the discriminatory approach towards outflows of short-term capital as intended by the Foreign Exchange Act. Another channel of erosion of capital mobility restrictions was rooted in the banking sector. With the expansion of foreign banks (and their branches) and the increasing weight of their transactions (between both residents and non-residents), the initial scheme (or “straitjacket”) tailored for taming the capital flows was weakening.

In October 1995, a new Foreign Exchange Act was adopted<sup>4</sup> which confirmed de jure the situation which existed de facto in many areas. In other areas it represented significant

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<sup>3</sup> See Dědek (2000) for more details.

<sup>4</sup> Further liberalisation of capital flows was stimulated by the Czech Republic’s politically driven entry into the OECD (in October 1995).

progress towards the liberalisation of capital flows even in the capital account.<sup>5</sup> With just a bit of simplification, we can conclude that the overall shift from the internal convertibility of the koruna to its external convertibility was finished in about five years.

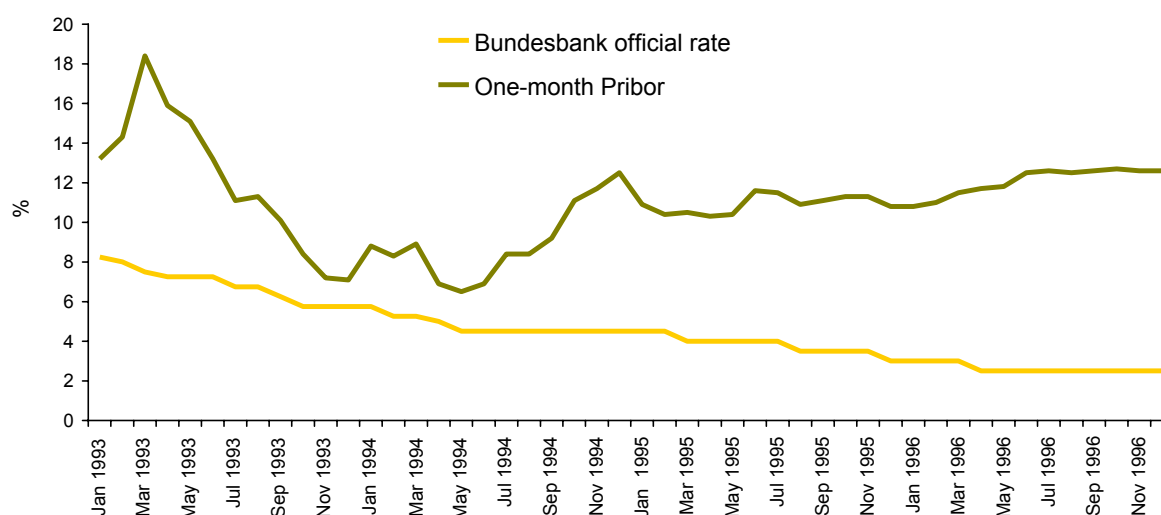
### 2.2.2. Emergence of the “impossible trinity”

The completion of capital account liberalisation and the maintenance of the fixed exchange rate led to the emergence of the impossible trinity (or the open economy trilemma), the extremely problematic parallel existence of: (a) free capital flows, (b) a fixed exchange rate and (c) an independent monetary policy.

The mechanics of the impossible trinity worked ruthlessly in the Czech case, especially when the currency obtained the “investment approved” status for more investors:<sup>6</sup> a high interest rate differential (see Figure 4) (due to a high inflation differential) in combination with the stable exchange rate invited sizeable capital inflows (Figure 5).

Figure 4

#### One-month Pribor and Deutsche Bundesbank official rate during 1993–96



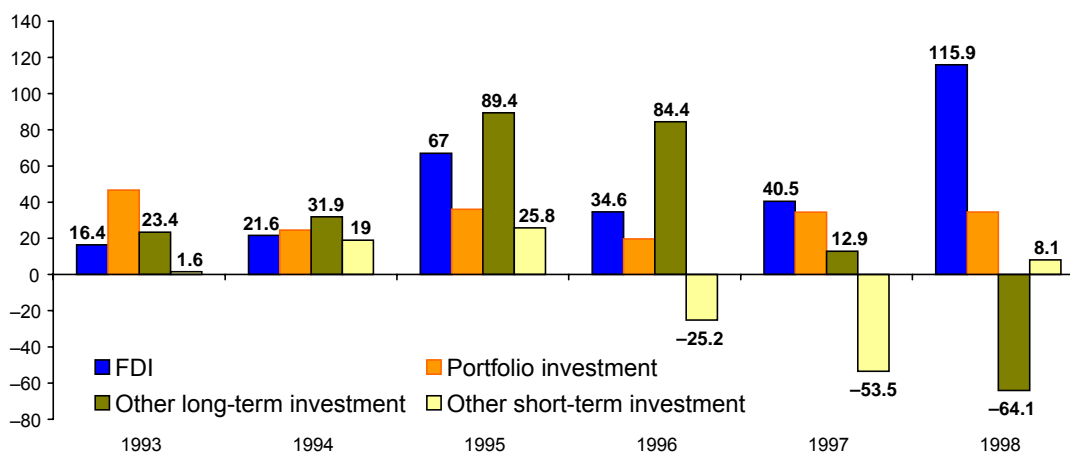
Sources: Eurostat, Czech National Bank.

Figure 4 shows that the interest rate differential narrowed somewhat during between the second half of 1993 and 1994 but widened again at the end of 1994, remaining quite substantial during 1995–96. Unsurprisingly, the inflow of capital (Figure 5) was very strong during this period, thus contributing to an overheating of the economy.

<sup>5</sup> Two major remaining restrictions were those on the purchase of real estate by non-residents and the opening of banking accounts by residents abroad.

<sup>6</sup> In 1993, the Czech Republic was designated as investment grade. The credibility of the economy (and currency) was boosted later on by several factors, such as a stronger reserve position, the above-mentioned capital account liberalisation and OECD membership.

Figure 5  
**Capital flows during 1993–98 (in billions of koruna)**

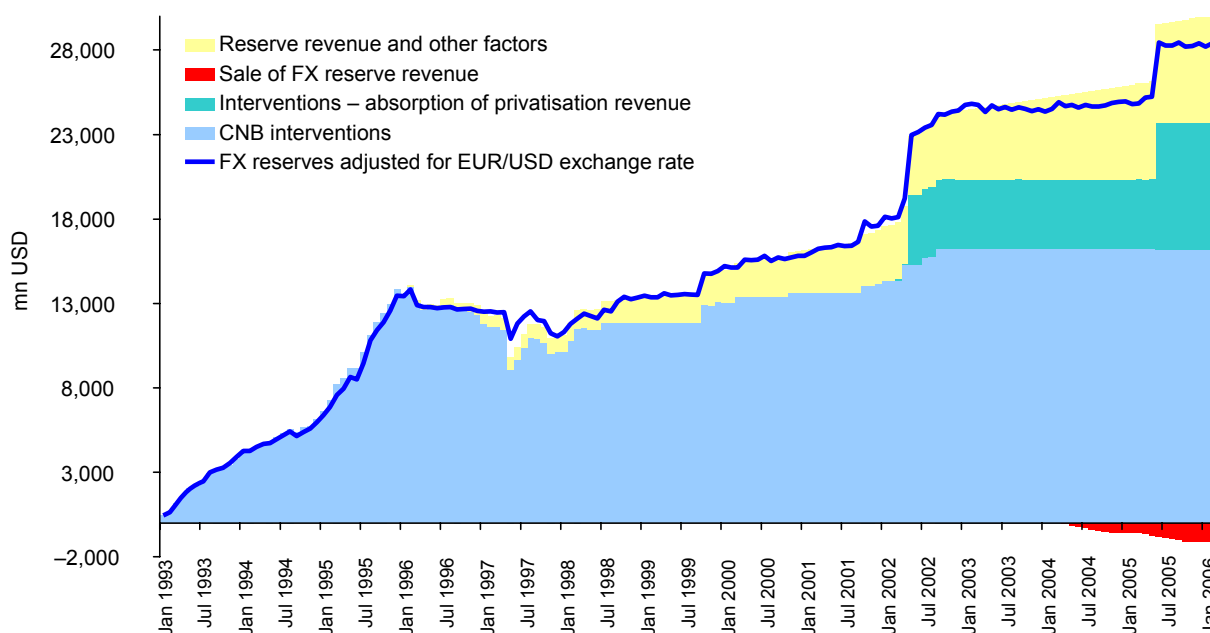


In terms of GDP, net FDI inflows reached 6% in 1998.

Source: Czech National Bank.

Maintaining the currency peg required interventions in the forex market (purchase of foreign currency for koruna), which led to an increase in the monetary base and monetary aggregates. The resulting sterilisation by the central bank led to a steady accumulation of foreign exchange reserves (Figure 6) and pushed the interest rates further upwards.

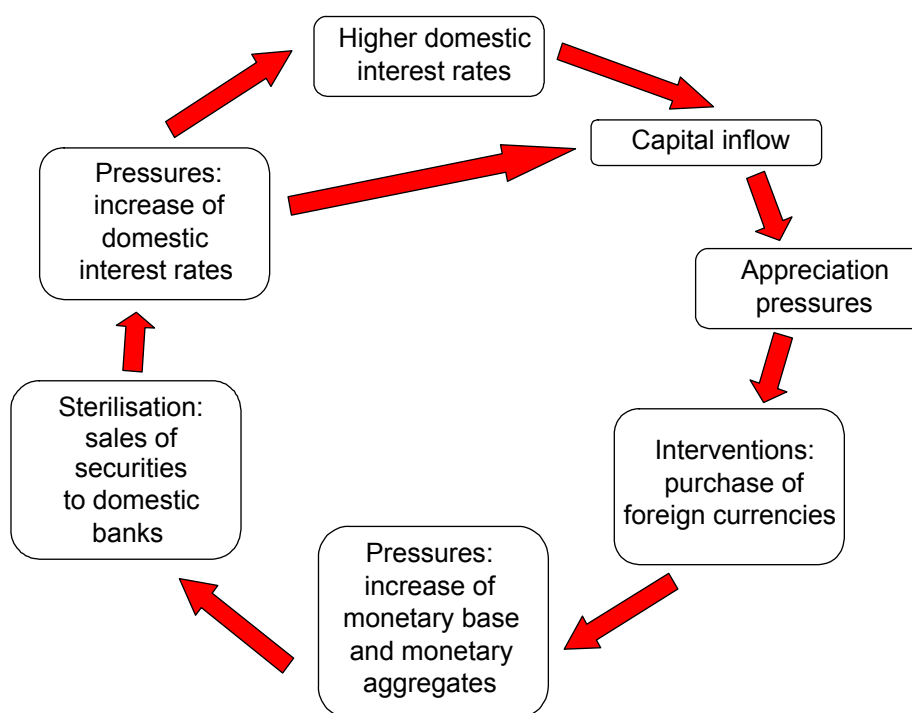
Figure 6  
**“Sources” of foreign exchange reserves of the Czech National Bank (in US dollars)**



Source: Czech National Bank.

Figure 6 shows a very steep increase in foreign exchange reserves (in USD terms) until the end of 1995 (the blue shaded area denotes the amount of reserves acquired through interventions; later on, specifically in 2002 and 2005, the amount of reserves also increased due to absorption of privatisation of revenue). Higher interest rate differentials provided further stimuli for capital inflow and completed the vicious circle (Figure 7).

Figure 7  
**Vicious circle of monetary policy during 1993–96**



### 2.3. Implications of capital flows during 1991–95

The amount of capital flows was insignificant at the very beginning of transformation when the economy was declining and far from being stable. This was irrespective of the fact that policymakers adopted some measures to attract foreign capital. The situation started to change after 1993, when growth resumed and the uncertainties related to the split of former Czechoslovakia vanished. While FDI and portfolio capital were attracted by newly emerging profit opportunities in the real sector, interest-sensitive forms of capital were stimulated by the parallel existence of: (a) a high interest rate differential (due to higher domestic inflation than abroad); (b) the increasing cross-border mobility of capital (due to a partly spontaneous and partly intended process of current and capital account liberalisation); (c) the fixed exchange rate of the koruna; and (d) a relatively liquid foreign exchange market. Although the monetary framework was transforming the capital inflows into foreign exchange reserves, it was not efficient enough to prevent further stimulation of domestic demand. Macroeconomic tightening and a change of the framework to address the issue of the impossible trinity were greatly needed.

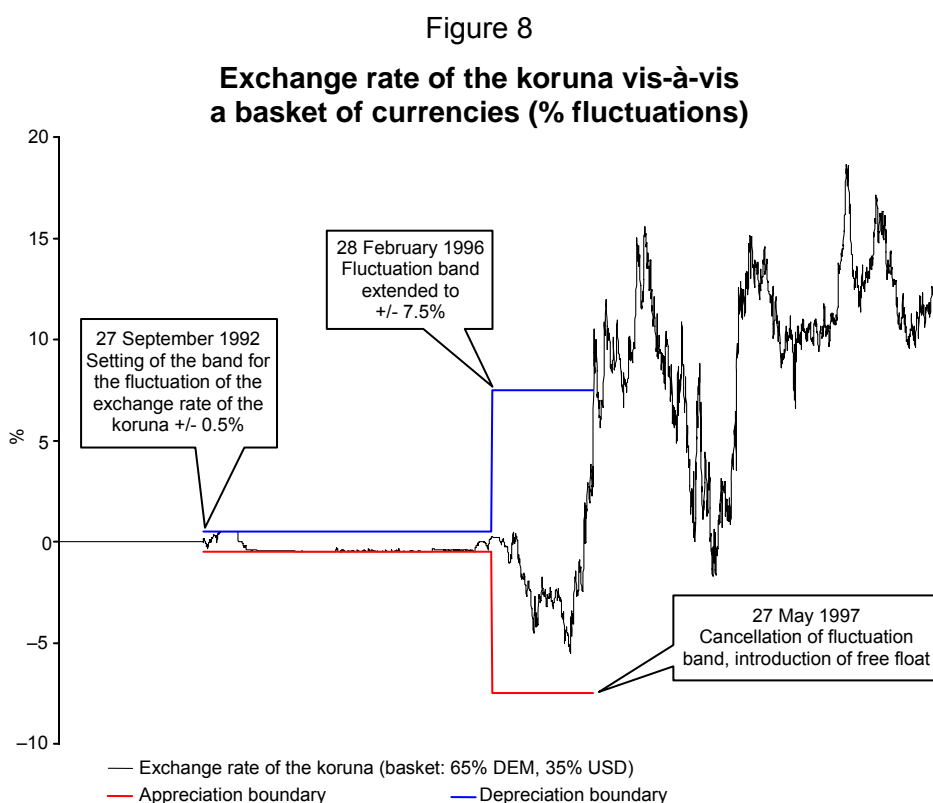
### 3. From the widening of the fluctuation band towards the speculative attack: 1996–97

At the end of 1995, the macroeconomic and monetary situation was on the verge of unsustainability. The economy was overheating, the current account was in deficit and rapidly deteriorating, and the costs of maintaining the currency peg were growing substantially. Stabilisation of the economy (possibly coordinated) became inevitable.

#### 3.1. Isolated attempts of the CNB to deal with imbalances

As the government at the time did not consider the macroeconomic imbalances to be a matter for concern, the CNB implemented restrictive policies without any support from government policies. As a consequence, the policy response was one-sided and insufficient. Although the CNB increased interest rates several times during 1996, overall monetary tightening was limited. At the end of February 1996, the CNB widened the fluctuation band of the koruna to  $\pm 7.5\%$  (from  $\pm 0.5\%$ ) to impede the inflow of speculative capital. Although widening the band introduced more uncertainty to foreign investors and halted the accumulation of reserves, the overall stabilisation impact was only partial and the fiscal-monetary mix remained too loose (or not restrictive enough).

Figure 8 shows that after the widening of the band, the koruna started to appreciate (vis-à-vis the basket of US dollars and Deutsche marks valid until May 1997).<sup>7</sup>



Source: Czech National Bank.

<sup>7</sup> After the abolishment of the fluctuation band (in line with an overall orientation of the Czech Republic towards the EU), the CNB declared the Deutsche mark (and later the euro) to be the reference currency.



The monetary development clearly had negative side effects on the real economy. The appreciation of the currency started to undermine the country's competitiveness, thus leading to the highest trade deficit (in terms of GDP) during the whole transformation period (see Figure 3 above). Although the appreciation helped to decrease inflation temporarily, the situation was fragile and the economy's vulnerability increased.

### **3.2. Currency crisis: fast capital outflows and subsequent stabilisation policies**

In early spring 1997, the sentiment on foreign exchange markets started to reverse. In February, the koruna reached its appreciation peak, and policymakers' inability to adopt the necessary corrective measures pushed it towards depreciation. The economic prospects were deteriorated by sudden worsening of public finances in April. Although the government adopted a certain stabilisation package, its credibility and adequacy was questioned by the market.

The koruna came under pressure on the foreign exchange markets during May and was exposed to an attack triggered by the problems in Asian foreign exchange markets. The foreign exchange regime was not sustained, despite sizeable foreign exchange and money market interventions. On 27 May, the CNB abandoned the currency peg and switched to a managed float. During June, the koruna depreciated by about 12% against the former central parity.

To stabilise the domestic currency, the CNB increased interest rates dramatically for a short period. Although this helped to keep the koruna from further depreciating, it dented economic performance by sharpening existing problems in the banking sector (bad loans) and the enterprise sector (inter-enterprise arrears) in subsequent months.

In June, the government adopted the second stabilisation package. It addressed two areas: in the macroeconomic area it implemented a fiscal tightening, a wage freeze in the public sector and the adoption of an import surcharge to restrict imports. In addition to this short-term stabilisation, the package addressed the legal, institutional and microeconomic bottlenecks of the economy with the aim of boosting supply side performance over the long run.

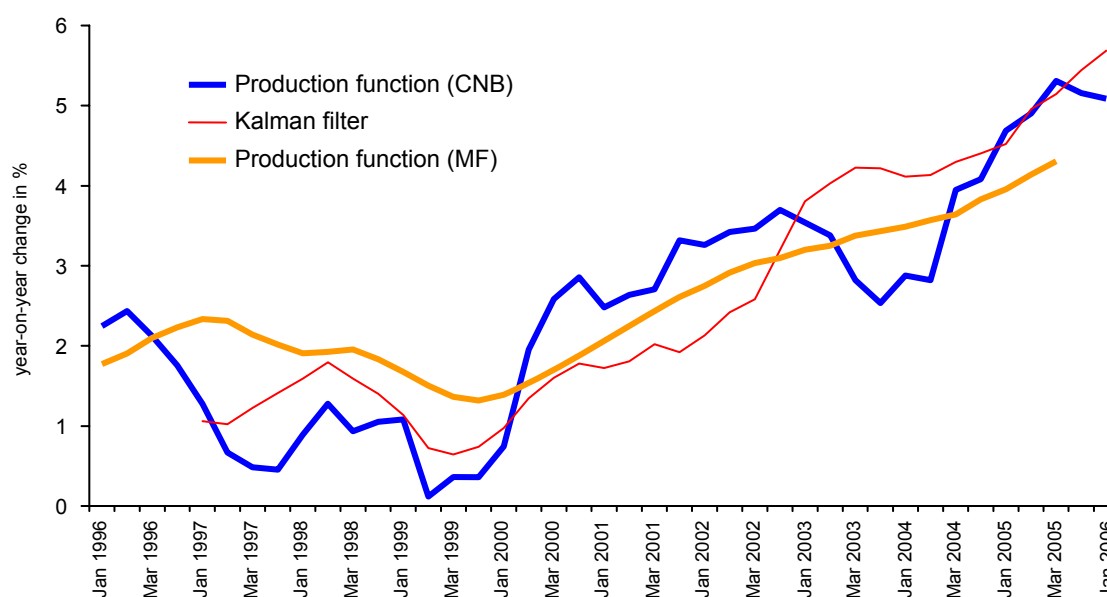
The macroeconomic restriction (both fiscal and monetary) combined with the restructuring of the banking sector<sup>8</sup> was rather robust, and the economy slipped inevitably into recession in 1997 and 1998 (see Figure 1 above). The subsequent period brought a mixture of bad and good news. On the positive side, the external imbalance started to shrink during 1998 and 1999, reaching substantially lower levels than before 1997. Supply side performance (due to intensified competition and progress in the institutional and legal spheres) was improving over time, which was reflected in an acceleration of potential output growth after 2000 (Figure 9).

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<sup>8</sup> The largest partly state-owned banks were privatised during 1998–2001. New owners started the restructuring soon after, but it took some years before the competition in the market increased.

Figure 9

**Growth of potential output according to different methodologies (1996–2005)**



Source: Czech National Bank.

In the monetary policy area, a new monetary regime had to be found soon after the abolishment of the currency peg. After some discussion, the CNB decided to adopt inflation targeting from the beginning of 1998. The rather untidy monetary discretion which prevailed in the aftermath of a speculative attack was thus replaced by a consolidated monetary framework with transparent and well defined decision-making. In other words, the earlier currency anchor was replaced by the inflation anchor which corresponded much better to the almost fully liberalised economy. Inflation targeting also improved the transparency of the CNB and gradually contributed to the credibility of the currency.

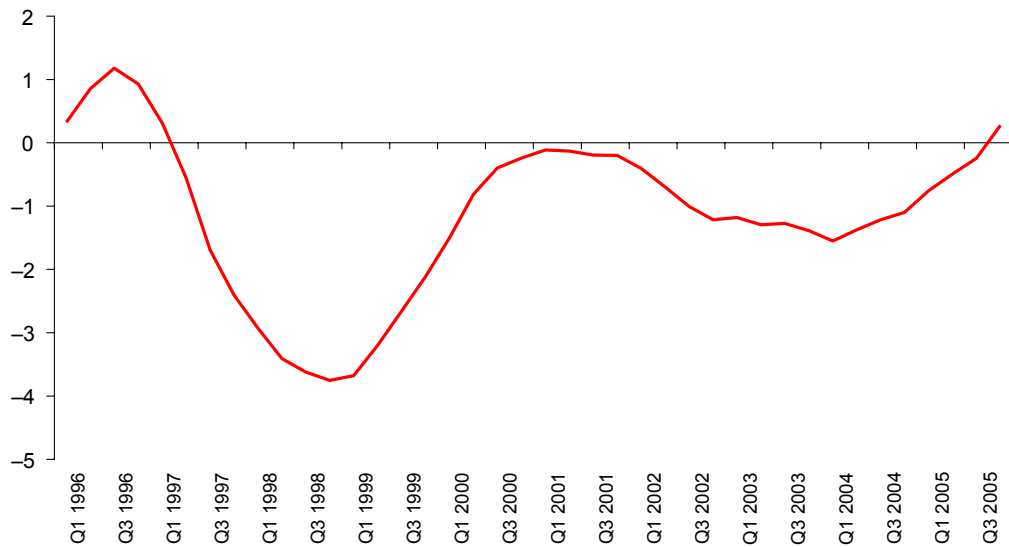
The post-crisis uncertainty and the negative output gap<sup>9</sup> were the key challenges for the conduct of monetary policy. Figure 10 shows the output gap, which reached about 4% of GDP in 1999.

The size of the output gap indicates that the adjustment of the (preceding) disequilibria was rather costly. The recessionary pattern of the Czech economy was even more striking because no similar development had occurred in the neighbouring transformation economies.<sup>10</sup> Also, unemployment started to increase, reaching around 8%. Although it was not very favourable for those who became unemployed, the macroeconomic development benefited from the fact that the higher level of unemployment helped keep wages in check for many following years.

<sup>9</sup> Obviously, given the way in which the output gap is constructed, this comment reflects an ex post analysis.

<sup>10</sup> For example, Hungary (whose economy slowed in 1995 due to the adoption of an austerity package by Prime Minister Bokros) was growing by 2.9% in 1997 and even by 5.7% in 1998.

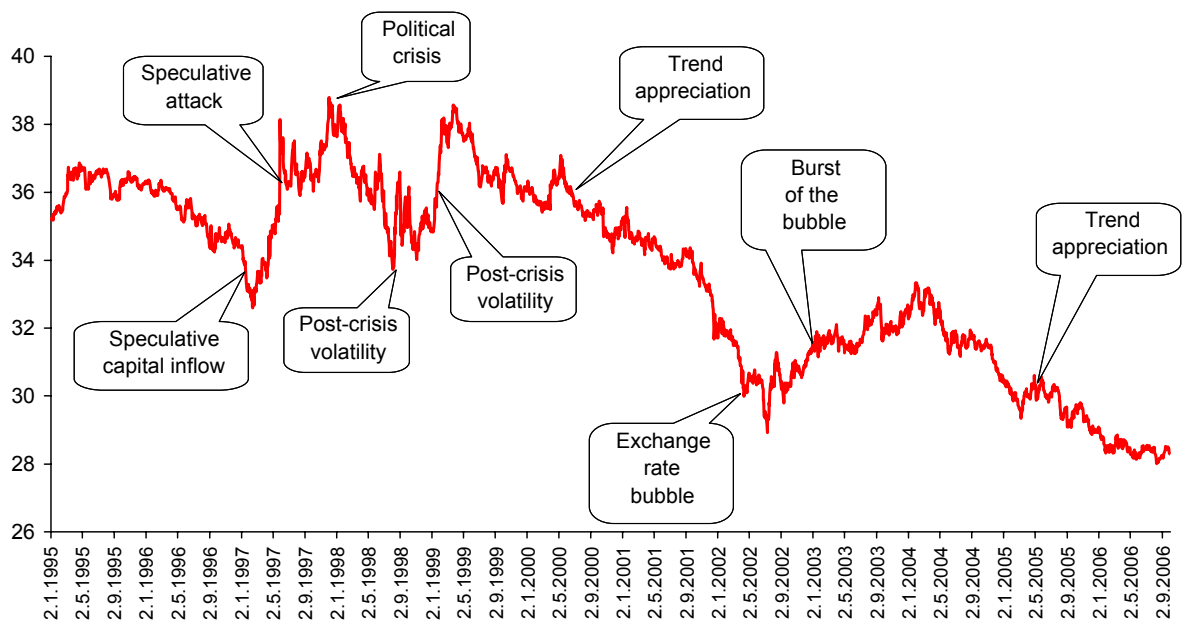
Figure 10  
**Output gap (as a percentage of GDP)**



Source: Czech National Bank.

The abolition of the FX rate peg and post-crisis macroeconomic stabilisation led to an increase in exchange rate volatility. As can be seen in Figure 11, after depreciating throughout 1997 the koruna appreciated quite strongly, supported by the high interest rate differential during 1998, but depreciated again in early spring 1999. The relatively fast and robust pass-through was thus transformed into more volatile inflation, complicating the formation of inflation expectations and the implementation of stabilisation policy based on inflation targeting.

Figure 11  
**Exchange rate of the koruna vis-à-vis the euro  
 (pre-1999 data obtained from the conversion rate  
 between DEM and EUR)**



Source: Eurostat.

### 3.3. Implications of capital flows during 1996–99

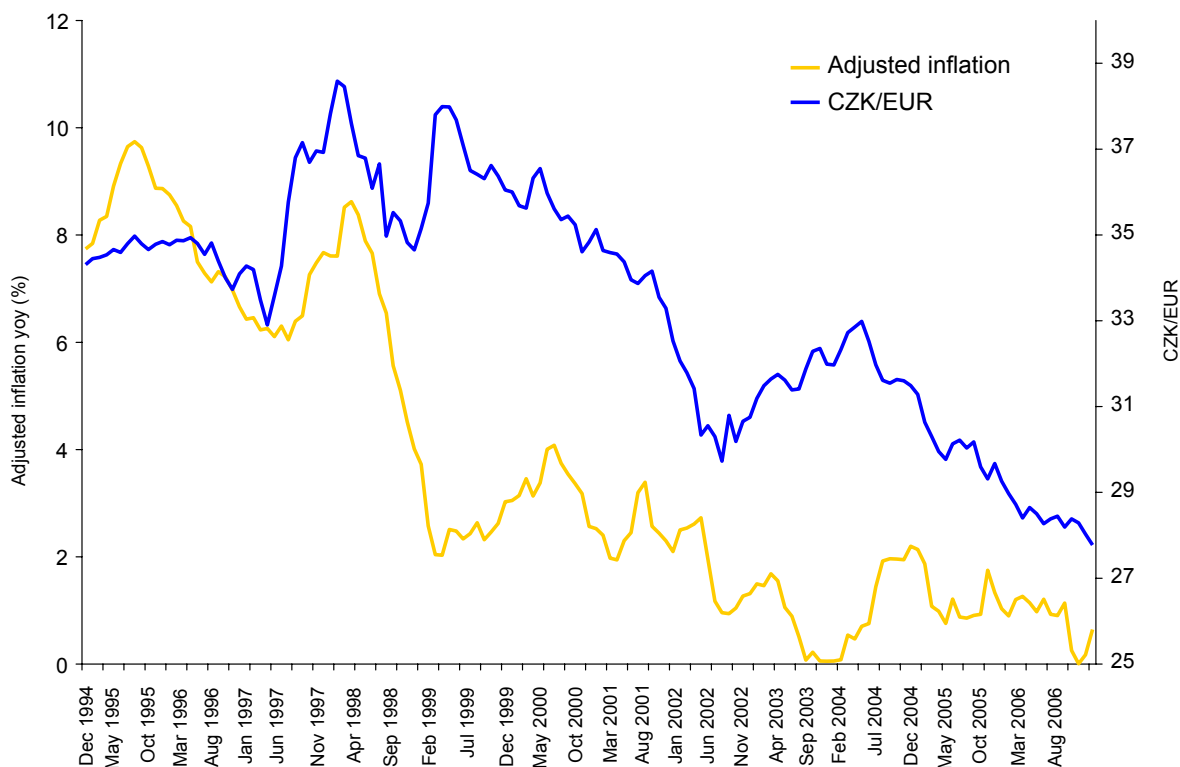
As Figure 11 clearly shows, capital inflows and outflows played a substantial role in the exchange rate volatility during 1996–99. The widening of the fluctuation band in February 1996 was followed by an appreciation which persisted until February 1997. As mentioned above, the worsening of market sentiment (driven by macroeconomic disequilibria) turned into capital outflows, which implied a depreciation of the koruna. To prevent further capital outflows and stabilise the currency after May 1997, interest rates were increased dramatically. The combination of a high interest rate differential and a recovery of the credibility of the koruna promoted capital inflows, and the currency steadily appreciated throughout 1998 until February 1999.<sup>11</sup>

As inflation plummeted during 1998–99, interest rates declined accordingly, implying a narrowing of the interest rate differential. The earlier appreciation was followed by a correction in February 1999, which partly reflected a declining (but still positive) carry on the koruna. In other words, the koruna exchange rate was on a roller coaster during 1996–99, with most of the volatility attributable to capital inflows and outflows. For monetary policy, this was a new experience.

Considering the rather high volatility of the currency and the remarkable openness of the economy, the stabilisation of inflation became a difficult and challenging task. Figure 12 indicates a rather close relationship between the koruna exchange rate and adjusted inflation (which refers to CPI inflation minus administered prices and food prices) during 1996–98.

Figure 12

**The exchange rate of the koruna vis-à-vis the euro and adjusted inflation during 1994–2006**



Sources: Eurostat, Czech National Bank.

<sup>11</sup> As Figure 11 shows, the koruna did not reach its pre-crisis level, but was stronger than in the period which preceded the widening of the fluctuation band to  $\pm 7.5\%$ .

## 4. Appreciation bubble in 2001–02

Figures 11 and 12 show that a steady appreciation of the koruna during 2000–06 was interrupted by an appreciation bubble in 2002 and its subsequent burst. First, we deal briefly with the trend towards appreciation and then with the exchange rate bubble. We investigate the role of capital flows in each case.

### 4.1. Trend appreciation and the sterilisation scheme

The appreciation trend starting around 2000 was driven by steadily increasing productivity gains (the Balassa-Samuelson effect) related to an advanced stage of microeconomic restructuring. As illustrated by Figure 9, productivity growth translated into an acceleration of sustainable growth.

In addition, the appreciation of the koruna was fostered by future appreciation expectations derived from accelerating sales of many large government-owned companies (announced by the government to occur from 2000 onwards). In order to offset potentially damaging appreciation pressures stemming from the sales of big blocks of government assets, the government adopted a special sterilisation scheme (developed by the CNB) which was supposed to isolate the impact of these sales on the foreign exchange market.<sup>12</sup> The adoption of the scheme in January 2002 was justified by the fact that the observed appreciation was occurring at a time when no inflow of short-term debt capital was registered. Thus, the expectations of future capital flows, rather than actual flows, were behind part of the appreciation. Policymakers' intention to adopt the sterilisation scheme (to face current expectations and future capital flows) was also justified by the assumption that the standard tool (interest rates) would hardly be efficient when dealing with flows unrelated to interest rate differentials.

### 4.2. Exchange rate “bubble”

The appreciation bubble starting at the end of 2001 and peaking in July 2002 was driven by both expectations and actual capital flows. Below, we examine the sentiment in the foreign exchange market and the capital flows as recorded by the capital account of the balance of payments.

#### 4.2.1. Development in the foreign exchange market

During the first four months of 2002, the koruna steadily appreciated as a consequence of persisting investment inflows and positive market sentiment. The rate of appreciation, however, was out of step with economic fundamentals, so the CNB decided to intervene in the market several times, both verbally and via forex interventions. With the fall in expected inflation, the Bank also lowered interest rates multiple times (see Figure 13). The appreciation sentiment in the market was fairly strong at the time, however, and the CNB's interventions failed to have any long-term effect on the koruna. There was moderate stabilisation in the middle of the year, when the appreciation trend halted, after the koruna hit a historical high of EUR/CZK 28.9.<sup>13</sup> This was attributable to covert interventions, through

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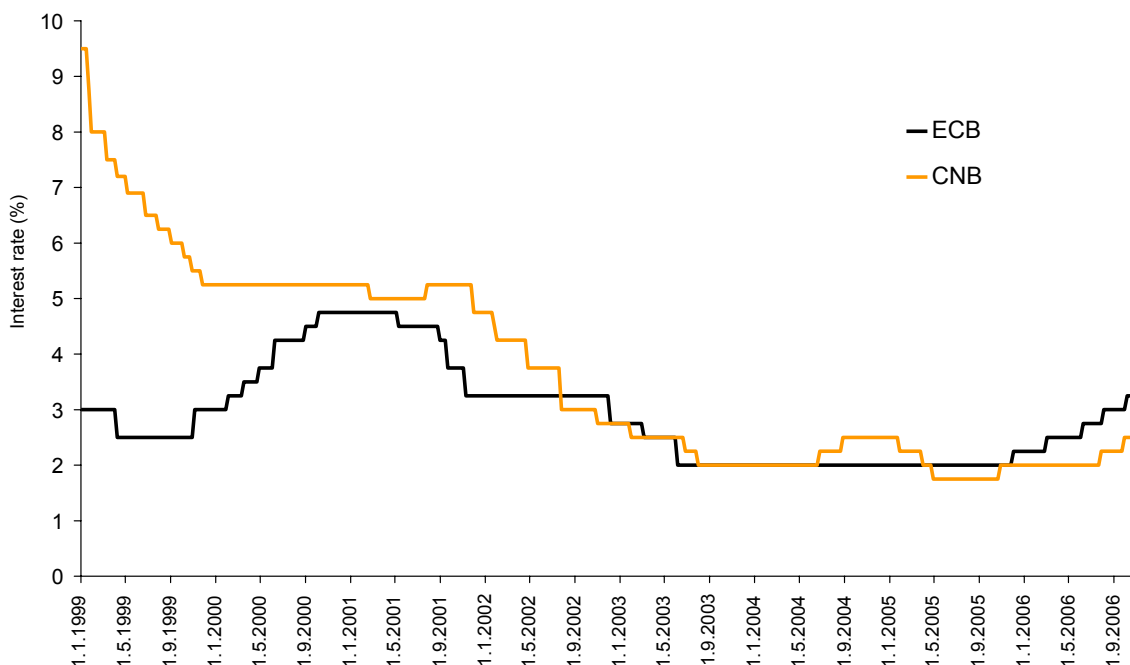
<sup>12</sup> The purpose of the scheme was to counteract the underlying market expectations that a sizeable increase in privatisation proceeds will sooner or later be converted on the foreign exchange market. The proposed approach was based on the assumption that the best solution is to keep the privatisation revenues (and other foreign exchange revenues of the government, eg from the de-blocking of its foreign receivables) to the maximum extent possible on a foreign exchange account at the CNB or to use them without the need for conversion into koruna. See [www.cnb.cz/en/monetary\\_policy/strategic\\_documents/download/vlada\\_cnb\\_kurz\\_en.pdf](http://www.cnb.cz/en/monetary_policy/strategic_documents/download/vlada_cnb_kurz_en.pdf) for details.

<sup>13</sup> The level was not reached before end-2005.

which the central bank succeeded in keeping the market in suspense. A sharp reduction in key rates (of 75 basis points in July) also had a psychological effect. This took the rates below those of the ECB.

Figure 13

### Two-week repo rates of the ECB and the CNB



Source: Eurostat.

After a swing in August linked to the uncertain impacts of floods, the exchange rate of the koruna set off on a downward course. Acting against the domestic currency were large foreign trade deficits (reported by the Czech Statistical Office), a negative interest rate differential against other central European currencies (bolstered by a further 25 basis point reduction in CNB rates at the end of October) and, at the end of the year, a sharp weakening of the dollar. Owing to the action of market forces and an easing of speculative pressures, in October the CNB stopped intervening directly in the foreign exchange market. Looking at the year as a whole, then, the koruna started 2002 at EUR/CZK 31.65 and with a strong appreciation trend, but a turnaround in that trend in the second half meant that it ended the year essentially unchanged, at EUR/CZK 31.60.

#### 4.2.2. Financial account of the balance of payments

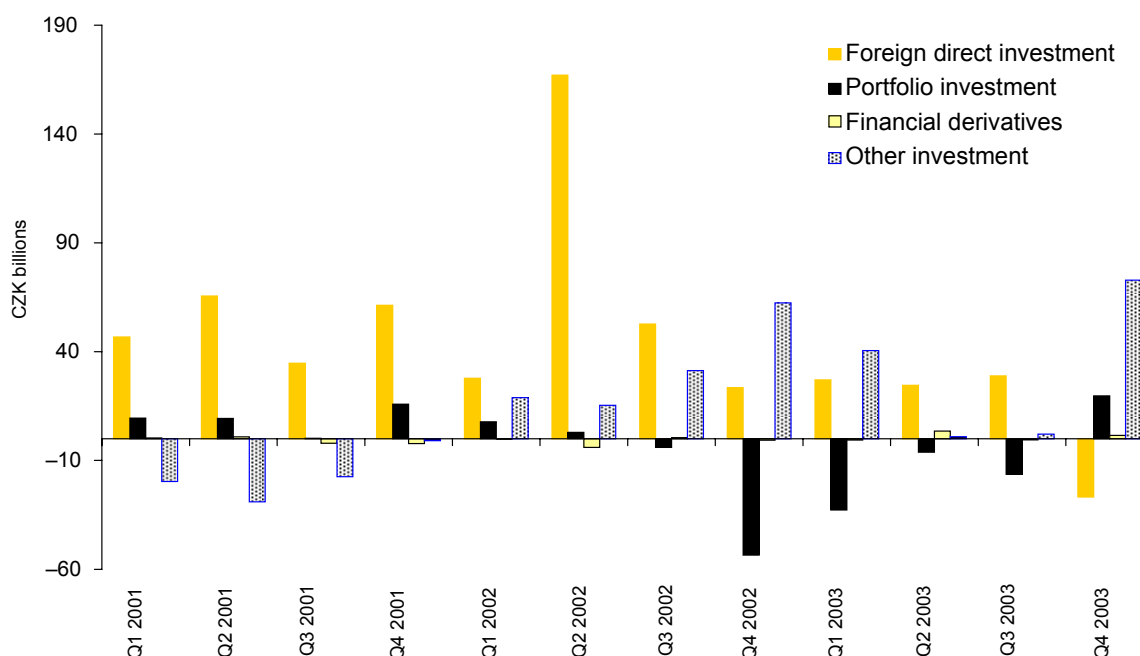
The financial account for 2002 recorded a net inflow of foreign capital of CZK 340.3 billion (EUR 11.0 billion), almost twice the previous year's figure. The largest inflow was traditionally from foreign direct investment. The total volume of FDI increased by around CZK 60 billion to a record CZK 276.1 billion (EUR 9.0 billion), thanks to high privatisation revenues. The ratio of FDI to GDP exceeded 10%. The year-on-year increase of 22.3% was due in particular to the sale of Transgas, to RWE of Germany. Adjusted for the state's sale of Transgas and the purchase of 40% of Česká spořitelna's<sup>14</sup> shares, the investment inflow was fairly even across the individual quarters of the year (between CZK 25 billion and CZK 28 billion), apart from in

<sup>14</sup> Česká spořitelna's is part of the three biggest commercial bank in the Czech Republic.

the third quarter, when there was an increase in purchases of corporate interests by foreign investors.

Portfolio investment recorded a net outflow of CZK 46.7 billion (EUR 1.5 billion) in 2002. Compared to 2001, when a net inflow of CZK 34.9 billion had been recorded, that means a turnaround in financial flows of CZK 81.6 billion. This was chiefly due to domestic banks, which converted a large proportion of their assets held in the form of short-term deposits into portfolio investment holdings. The largest outflow of portfolio investment occurred in Q4 2002 (CZK 53.5 billion) (see Figure 14), when domestic banks on balance invested CZK 34.8 billion in foreign bonds and there was a simultaneous decline in investment by foreign investors in domestic bonds. In the third and fourth quarters, the interest of foreign investors in Czech debt securities steadily waned. Foreign investors' behaviour was arguably linked to the evolution of the interest rate differential and the expected exchange rate of the koruna, as well as to the availability of more lucrative investments in neighbouring countries such as Poland and Hungary,<sup>15</sup> on a cost of carry basis.

Figure 14  
Financial account during 2001–03



Source: Czech National Bank.

Other investment showed a net inflow of funds of CZK 122.0 billion (around EUR 4 billion). As compared to the previous year, when this item had recorded a net outflow of around CZK 67.1 billion, this represents a sharp change in the direction of financial flows. The inflow of capital into the Czech Republic started in the first quarter and steadily gathered pace, especially in Q4 (see Figure 14). Domestic banks accounted for much of this inflow (CZK 115.5 billion). During the course of the year they gradually withdrew their short-term assets from foreign banks (total fall in short-term deposits: CZK 97.9 billion) and steadily decreased their short-term credit exposure to non-residents.

<sup>15</sup> There was also anecdotal evidence that some of the investors used the koruna as a financing currency for purchases of positive carry currencies.

### 4.3. Implications of capital flows during 2001–02

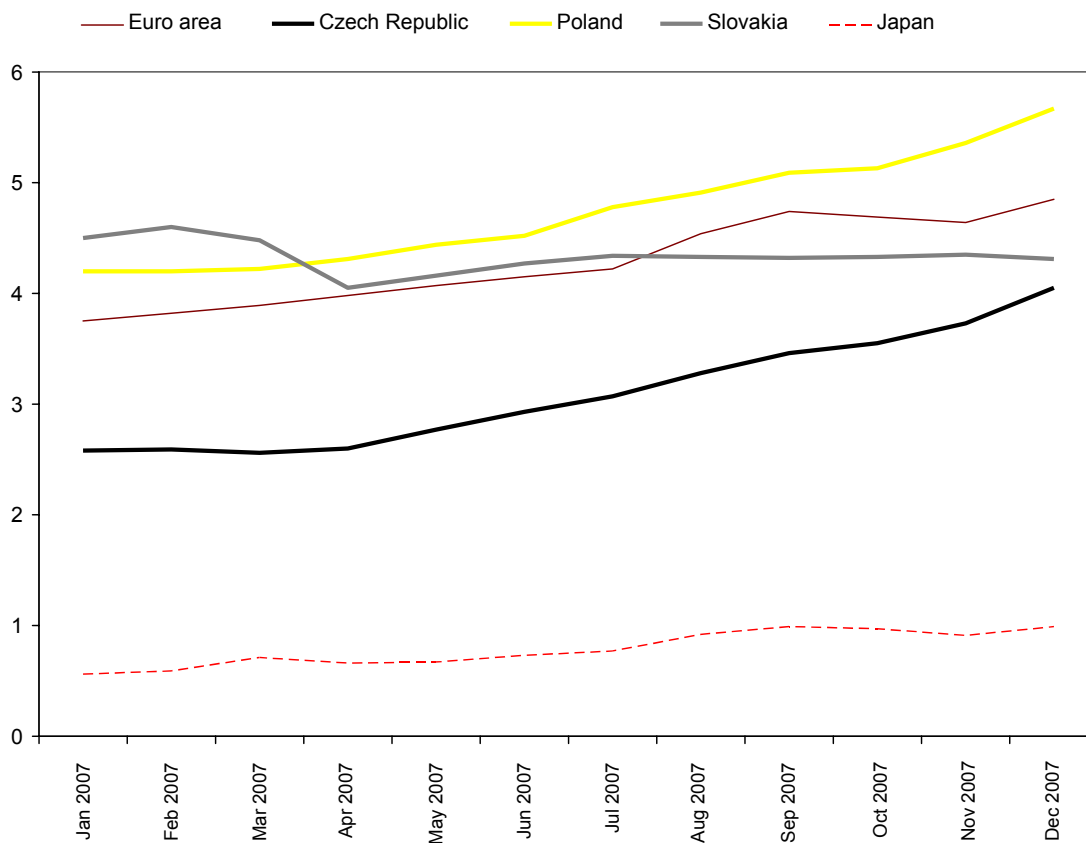
Capital flows became an important factor in exchange rate development during 2001–02. The combination of: (a) an unprecedented inflow of FDI related to large sales of government assets; (b) expectations of further inflows; and (c) speculative flows of capital driven by expectations of koruna appreciation inflated the exchange rate bubble during the first half of 2002. The adoption of the sterilisation scheme by the government and the CNB in combination with a series of exchange rate cuts (supplemented by other negative news from the real economy) probably supported a gradual reversal of sentiment in the foreign exchange market and brought the koruna's exchange rate back towards its fundamentals. However, it took some time before the correction depreciated the currency, so the costs of this episode for the economy were not negligible. Appreciation of the currency translated into deflation in 2003, which lasted about eight months. An unexpected decline in inflation led to an increase in real wages, which implied an increase in household consumption and somewhat higher volatility in the GDP during 2003.

## 5. 2007 experience with carry trades

As seen in Figure 15, short-term interest rates have become significantly lower than those in other markets. The gap was widened by the start of the monetary tightening by many central banks. As result, investments in koruna-denominated fixed income instruments lost their attraction, but at the same time, financing in the currency became “cheap” in nominal terms.

Figure 15

### Three-month interest rates



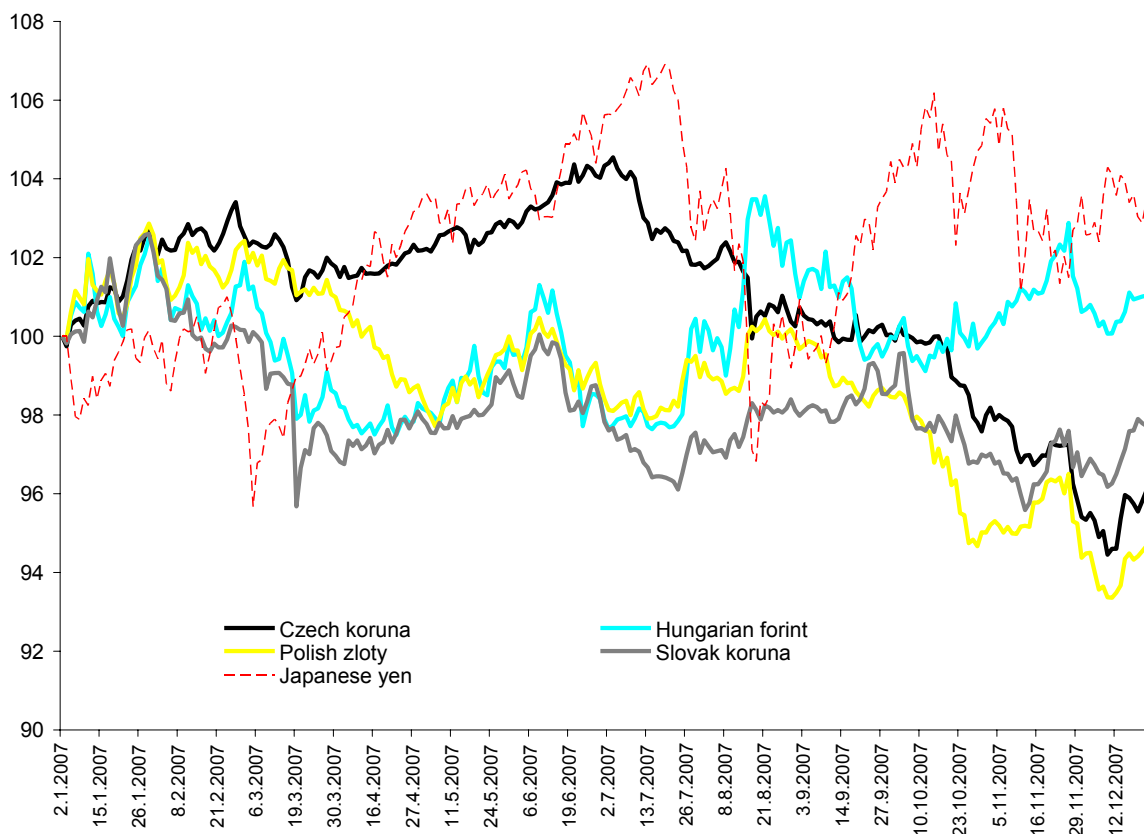
Source: Eurostat.



Since 2006, many market participants have started to talk about the growing use of the koruna as a financing currency in carry trades. There was rather weak evidence of this from statistics, which were not showing any large swings in the position of the domestic banks with non-residents, or from the forex market, where the currency kept its trend and maintained a positive correlation with the regional currencies.

Figure 16

**Exchange rates of selected currencies in 2007**



Source: Eurostat.

As seen in Figure 16, since March 2007 there has been a significant change in trends, and the koruna has started to depreciate slowly but continuously. Instead of being positively correlated with currencies from the region, the koruna has begun to follow other “nominally cheap” currencies like the yen or the Swiss franc. The abrupt end of this trend was clearly related to the closing of carry trade positions in the summer of 2007, when overall risk aversion and risk assessment changed. Over a very short period, the Czech currency offset all its losses and got back to its “usual” appreciation path.

Backward checking of the data does not reveal the whole story or the size of the carry trade market in koruna. The change of the net position of domestic banks vis-à-vis non-residents was not large enough to account for the move. It was partly due to the off-balance sheet nature of many carry trade deals. Indeed, the growth of derivatives, which could be used for carry trades, was much higher in the spring of 2007 (20% versus 6.5% a year earlier), but still it does not give a clear evidence of the size of the money flow (or rather exposure flow) that took place during this period.

## 6. Challenges ahead – dealing with a floating currency in a liberalised market?

Over the last two years, the koruna enjoyed a period of a relatively low volatility and a continuation of the former appreciation trend. On average, the currency appreciated by almost 5% in 2006. In this environment, the CNB repeatedly undershot its inflation target, with interest rates well below those of the ECB. Understandably, this situation is challenging for monetary policy. Should there be reasonable certainty that the average yearly appreciation will be around 3–4%, it would be possible to incorporate this assumption into the inflation forecast.<sup>16</sup> This would reduce the risk that the interest rates set by the CNB would be too high in the future. Surprises on the appreciation side and undershooting of the inflation target would be less likely.<sup>17</sup>

There are several ways to deal with this problem. First, the equation can be changed in such a way as to reflect future developments to a great extent. This places less weight on economic theory (UIP, etc) and more on past experience. Obviously, in the case of successful incorporation of the trend appreciation into the model, the problem is how to distinguish short-term deviations of the currency from the trend (like the episode mentioned in Section 5) from a possible “appreciation bubble”, which could lead to a large forecasting error and a possible surge in inflation. The second way is to focus more on the forecast of risks related to uncertainty concerning the future path of the exchange rate. This is easier, but depending on a variety of scenarios it could lead to very unclear signals being derived from the forecast.

At the end of the day, the likelihood of continued appreciation matters very much for monetary policy. And as shown above, in recent years this has been more a question of market expectations than of capital flows. The question therefore arises as to how robust those expectations are.

From the point of view of stability of expectations, the balance of payments is one of the key variables. Despite the recent improvement of the trade balance, there is an issue of consistency of appreciation expectations with the balance of payment forecast, especially from the point of view of the investment position of the Czech Republic.

Foreign assets account for around 25% of GDP, and liabilities are in the range of 50%. But while the assets are mainly in the form of foreign exchange reserves at the CNB (yielding a low rate of interest),<sup>18</sup> FDI (which represents the majority of debit items) generates returns in multiples of yields on assets.<sup>19</sup>

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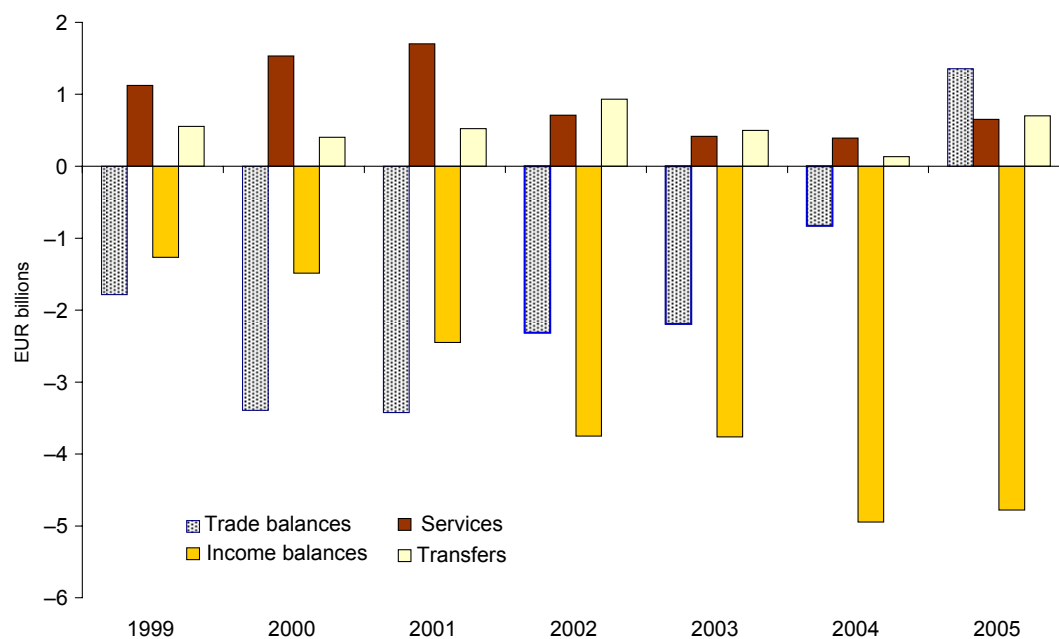
<sup>16</sup> Within the current forecasting framework, the main problem stems from the equation based on both UIP and the equilibrium speed of appreciation, which systematically underestimate the pace of appreciation in recent years.

<sup>17</sup> Estimates for FX pass-through are around  $\frac{1}{3}$ , so the impact of the stronger currency on inflation can be substantial.

<sup>18</sup> Reserves are invested mainly in high-grade government bonds and bank deposits. As a consequence, yields depend on market conditions in the range of 2–5%.

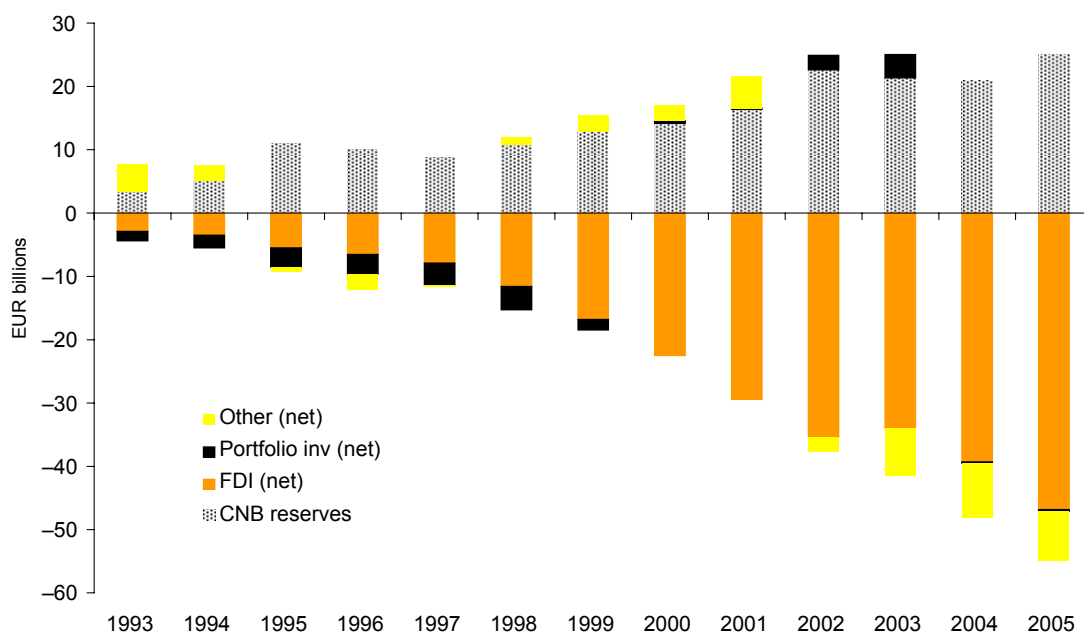
<sup>19</sup> Return on equity often exceeds 20%.

Figure 17  
**Structure of the current account of the balance of payments**



Source: Czech National Bank.

Figure 18  
**Investment position of the Czech Republic**



Source: Czech National Bank.

The data show that despite an impressive improvement in the trade balance and surpluses in other components, the growing negative balance of income (currently 5% of GDP) will be pushing the current account towards a deficit in the future.

It could be argued that the part of the income balance deficit is “going back” through reinvested earnings of the financial account (between  $\frac{1}{3}$  and  $\frac{2}{3}$  in recent years), but this simply means that the negative investment position will further deteriorate, and the problem in income balance will be shifted into the future.

## 7. Lessons

Since the beginning of its transformation, the Czech economy has accumulated a large body of experience with capital flows. During 1990–93, capital flows were still insignificant due to relatively strict regulation of capital mobility and low overall credibility of the economy. However, step by step deregulation, accompanied by a spontaneous erosion of regulatory arrangement, enhanced capital flow volumes. The macroeconomic and monetary framework in the first half of the 1990s was highly conducive to large capital inflows. A fixed exchange rate combined with high interest rate differentials became irresistible for foreign investors, and in the middle of the 1990s the economy was trapped by the impossible trinity. Although the sizeable capital inflows were sterilised by the CNB, they contributed to the overheating of the economy and the emergence of large current account deficits. The maintenance of the fixed exchange rate thus translated the capital inflows into domestic demand and the expansion of the central bank’s foreign currency reserves.

The widening of the exchange rate band partially helped to solve the puzzle of the impossible trinity. Although the risks of investing in domestic assets increased, ongoing capital inflows translated into an appreciation of the koruna (rather than to an accumulation of reserves under the previous regime). This undermined the competitiveness of exporters and contributed to the slowdown of economic growth. A quite alarming worsening of economic fundamentals at the beginning of 1997 reversed market sentiment, and the assessment of the Czech economy by foreign investors. Earlier capital inflows turned to outflows partly as a consequence of the South Asian currency crises in 1997.

The currency attack of May 1997 terminated the fixed exchange rate period and initiated the period of managed float (and inflation targeting since 1998) characterised at first by increased exchange rate volatility (and inflation). During 1997–99, the koruna depreciated (1997), appreciated (1998) and depreciated (1999), by around 10% on a year-on-year basis in each case.

The overall assessment of the developments during the 1990s is that Czech policymakers underestimated the impact of capital flows in a gradually liberalised economy, the trends towards overheating and external imbalance, and the risks related to the impossible trinity. The fixed exchange rate regime in 1996 was not supported by other policies (when the economy was facing growing imbalances), and the very abolishment of the peg was the consequence of the currency crisis rather than of a wise policy decision.

The managed float regime has brought new challenges: while high exchange rate volatility<sup>20</sup> makes inflation more volatile (than was the case under the fixed exchange rate), the trend appreciation of the koruna has tended to keep the level of inflation below the CNB inflation target over time.

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<sup>20</sup> By maintaining that low exchange rate volatility should be a focus of policymakers, we do not mean that currency floating should be restricted, or even replaced, by any kind of fixed exchange rate regime.

Conducting monetary policy in such an environment is not an easy task. Based on standard know-how, the exchange rate forecast would often be too weak, the inflation forecast too high and interest rates thus higher than optimal. Undershooting the inflation target is the likely outcome. Incorporating more currency appreciation, empirically observed most of the time, into the forecast is not a trivial matter either, if transparency is required. Among other problems, this approach could be considered by market participants as a support for the central bank for the “hard currency policy”, and can thus bring even more currency appreciation and eventually more volatility of the economy.

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