

# Dániel Felcser and Gyöngyi Körmendi: International experiences of banking crises: management tools and macroeconomic consequences\*,<sup>1</sup>

*Our study summarises the experiences of earlier banking crises on the basis of international data. Following a review of the tools which can be used in the initial, acute phase of banking crises and a description of the lessons drawn from their application to date, we examine the macroeconomic consequences of banking crises. Based on international experiences, although the growth rate of the economy may turn positive relatively quickly after a banking crisis, output losses are high, unemployment remains a problem for a longer time, and protracted adjustment processes start in the banking sector.*

## INTRODUCTION

The current financial crisis appeared in the form of banking crisis in most of the countries affected. In addition to bankruptcies, several banks which ran into trouble were recapitalised or nationalised, just to mention the most spectacular elements. As a banking crisis entails severe real economic effects, its avoidance or proper management is an important economic policy task. This also contributed to the strengthening of financial stability aspects in monetary policy decision-making both in Hungary and a number of other countries.

On this occasion, the financial crisis started in the developed countries, mainly in the United States, and the next victim – owing to its high exposure to the US mortgage market – was the banking sector of the developed European countries, where concerns about high sovereign debts have also come to the fore now.

As the Hungarian economy and banking sector also constitute an integral part of the European economic and financial system, which has been hard-hit by the banking crises, Hungary is also seriously affected by the macroeconomic effects. In parallel with the international developments, after October 2008 the liquidity situation in the Hungarian financial system deteriorated severely, and the foreign exchange, equity and government securities markets also came under significant pressure. The evolving liquidity and balance of payments crisis was overcome with the help of the international financial package as well as the

measures of the Magyar Nemzeti Bank and the government. The crisis threatening the capital position of foreign parent banks did not pass through to their subsidiaries in Hungary. However, the fiscal policy room for manoeuvre, which is limited owing to the high public debt, and the real economy, which is contracting more strongly than the European average, add to the risks related to the banking sector.

Taking account of Hungary's exposure to international crisis developments, it is worth reviewing how the banking crises observed in past decades took place. Of course, many important features of the current crisis are different from the earlier cases, which warrants a cautious handling of conclusions. However, we still believe that it is worth summarising what dangers have been highlighted by the experiences of past systemic bank crises.

For the identification of banking crises, we took the banking crisis definition of the International Monetary Fund (IMF) as a basis, according to which those episodes are called systemic banking crisis<sup>2</sup> when the number of bankruptcies increases significantly in the corporate and financial sectors of a country, and/or companies have serious difficulties settling their debts on time. At times like these the ratio of non-performing loans usually increases considerably, and the capital of the banking sector declines. In many cases these developments are accompanied by a fall in asset prices (equities and real estate in particular), a drastic increase in the real interest rate and a sudden stop or reversal of capital inflows. As can be seen from the very general wording of the

\* The views expressed in this article are those of the author(s) and do not necessarily reflect the official view of the Magyar Nemzeti Bank.

<sup>1</sup> This article is an excerpt from a longer background study prepared with the participation of Attila Csajbók, Zoltán M. Jakab, Judit Krekó, Henrik Kucsera and Katalin Szilágyi.

<sup>2</sup> Banking crisis hereinafter always means systemic banking crisis affecting the banking sector.

definition, the identification of crisis episodes also allows subjective deliberation to some extent.

The episodes examined by us originate from the international database of Laeven–Valencia (2008), compiled in the spirit of the above definition. The authors presented 42 cases in detail; of these, we selected the crises of the economies with a higher level of development that are better integrated in the world economy, ignoring the still ongoing crises. We complemented the resulting 30-element sample with macroeconomic data from the financial database of the IMF (International Financial Statistics, IFS).

We paid special attention to characteristics, which we believe to deepen banking crises. In our opinion, one of these aggravating circumstances is if the banking crisis is coupled with a currency crisis<sup>3</sup> or if the fiscal means available for its management are limited, for example because of debt accumulated earlier. The latter category includes those episodes where, prior to the crisis, the level of public debt exceeded fifty per cent of GDP, which is a higher-than-average threshold value. In addition, we strived to obtain further, less quantified information from the case studies about individual episodes, for example about measures taken by the authorities and the magnitude of currency mismatch of economic agents.<sup>4</sup> It is worth mentioning that the latter two of the examined factors are typical of the Hungarian economy as well, and that the exchange rate of the forint also underwent a significant depreciation in the first quarter of 2009, even if no currency crisis in line with the definition of the IMF was experienced.

On the basis of these data, first we examine what measures are characteristic of a ‘typical’ banking crisis. Within that, we concentrate in particular on the first period, which can be characterised with the liquidity crisis, during which monetary policy may play a greater role, allowing the drawing of more interesting conclusions from a central bank aspect. Then we examine how the various macroeconomic and financial variables behaved in the environment of banking crises over several years. Although the average developments in various variables cover heterogeneous countries, the fundamental trends can be seen from the average behaviour as well. As a result of the time span, at the same time this also provides an outlook on the period after the liquidity crisis, which is characterised by the restructuring of the banking sector and the increased role of fiscal policy.

## LIQUIDITY CRISIS MANAGEMENT

The period of a banking crisis can usually be broken down into two broad phases: the aim in the first phase is to solve liquidity problems and to prevent the tensions of the banking sector from passing through to real economy, while in the second phase the restoration of the ability to function and the solvency of the banking sector comes to the fore. These two phases cannot perfectly be separated in time; liquidity troubles may return from time to time during protracted banking crises.

Liquidity problems may be triggered by a loss of confidence among domestic depositors or foreign lenders. While in the former case domestic foreign exchange liquidity becomes tight, and bank run may occur, in the latter case the scarcity of foreign currencies is typical, which is accompanied by capital outflows in many cases.

Central banks can remedy liquidity shortages in foreign exchange to the extent of the foreign exchange reserves by providing foreign exchange liquidity or by FX swap<sup>5</sup> agreements with foreign central banks, and the government can borrow from international organisations. Additional help may be if foreign banks operate subsidiary banks in the given country and the parent banks themselves provide foreign exchange liquidity to their subsidiaries.

The scarcity of domestic currency can be treated with liquidity support, lowering of the reserve requirements, deposit guarantees or, in more serious cases, with ordering a bank holiday or possibly by freezing deposits. The frequency of using these means is very different: while targeted liquidity support proved to be very widespread in the sample examined, lowering of the reserve requirements, which affects all banks equally, was used somewhat less often (Chart 1). Undertaking and extending deposit guarantees is also among the relatively more frequently applied tools; it is common mostly in those countries where there is no functioning deposit insurance system when the crisis begins. In these cases, a credible blanket guarantee ordered in time may be able to prevent the evolution of a bank panic. In view of their drastic character, freezing deposits and ordering a bank holiday are much less frequently applied tools; moreover, they are unable to terminate the uncertainty itself and are only suitable for gaining some time.

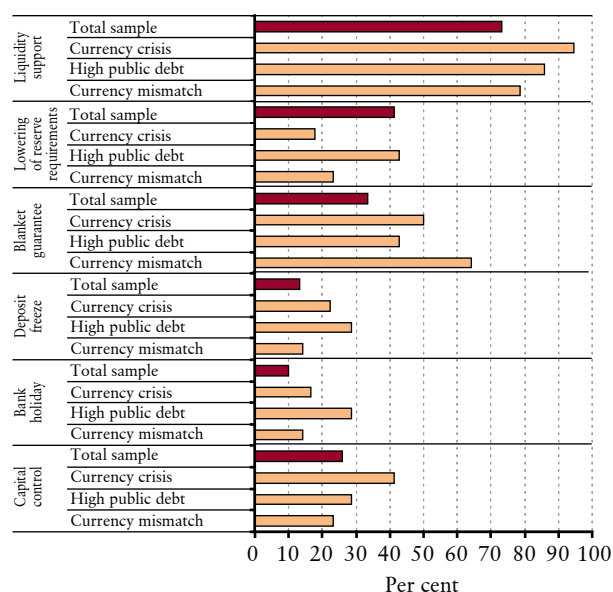
<sup>3</sup> Those cases are defined as currency crisis where the magnitude of the depreciation of the domestic currency exceeded 30 per cent in a year and the rate of depreciation was 10 per cent higher than in the previous year. The database under review indicates these cases separately.

<sup>4</sup> See, for example Allen et al. (2002). A total 17 of the 30 crises were classified into the currency crisis group, while in 14 cases unhedged foreign exchange position and in 8 cases high initial public debt were typical. The exact classification is shown in the annex. Due to missing data or outliers, the final size of groups may be smaller for some variables.

<sup>5</sup> An FX swap transaction may be interpreted as borrowing in one currency and simultaneously depositing in another currency, where the claim in one currency serves as collateral for the liability outstanding in the other currency. A more detailed explanation is provided in the article by Mák–Páles (2009).

Chart 1

### Relative frequency of means most often used by authorities in banking crisis management



Sources: Laeven–Valencia (2008) and own data collection.

The frequency of using individual tools can change significantly depending on the circumstances of the banking crisis as well, because then the efficiency of the tools and the risk of their use may change. In the case of currency crises and considerable unhedged exchange rate risks (currency mismatch), liquidity support takes place more often compared to the whole sample, while the reserve requirements are lowered less frequently. This is an attempt to avoid the danger that the liquidity surplus that evolves at certain participants as a result of the general liquidity expansion will be used for exchange rate speculation. The blanket guarantee is also a popular tool, as it also does not provide broad opportunities for making profits by weakening the exchange rate.

The frequency of using drastic means is relatively high in the group of countries with high public debt. Presumably, this occurred in those cases when the government was not able or willing to finance other, more expensive measures any more, or when the introduction of a state guarantee on deposits was not sufficiently credible due to the high indebtedness.

The management of banking crises can be very costly. According to the IMF database, fiscal costs directly related to crisis management amount to an average 15 per cent of GDP in the year of the crisis and the subsequent five years. If the revenues that later return to the budget (for example from the subsequent privatisation of the nationalised assets) are also taken into account, this value still exceeds 10 per cent of GDP. Another aggravating circumstance according to Reinhart–Rogoff (2008) is that the costs directly related to crisis management appear small in comparison to the fiscal costs of the lost tax revenues and surging social expenditures resulting from the recession accompanying the banking crisis. Therefore, they consider the cumulative growth of public debt a good indicator, which was 83 per cent higher in real terms and on average in the sample they examined in the three years following the crisis. Financial markets are less willing to tolerate an increase of this magnitude in public debt in the case of a high initial level.

In addition to the classical tools of managing bank liquidity crises, Chart 1 also shows the frequency of *ex post* controls on capital outflows. It is also worthy of note – and cannot be seen in the chart – that capital controls were introduced in the sample processed by us only when a currency crisis was also evolving in parallel with the banking crisis. Therefore, capital control as a tool rather serves the purpose of currency crisis management, i.e. it is not the primary means of solving the banking liquidity crisis.

#### Box 1: Application of drastic management tools in banking crises

In spite of the fiscal tightenings announced earlier and an additional loan from the IMF, a bank panic erupted in Argentina in November 2001. As a result, banks were temporarily closed, and the withdrawal of deposits was limited (*corralito*). The financial intermediary system became paralysed because of the freezing of deposits and bad mortgage loans. The limitations on the withdrawal of deposits were lifted after more than a year, and bank items were converted from dollar to peso at an asymmetrical exchange rate. During the conversion, the depositors bore the brunt of the loss stemming from the market rate,

and this, in turn, destroyed the confidence in the domestic currency, the impact of which was felt over a longer period as well.

Depositors were also hard-hit by the banking crisis in Indonesia. Between August and the end of October 1997 the exchange rate weakened by 40 per cent against the US dollar, leading to the bankruptcy of 16 small banks. These banks were closed down on 1 November without compensating their depositors in any form. This triggered a permanent bank panic, wrecking more banks, despite the fact that at

this time the ratio of non-performing loans was still relatively low (Meesook et al., 2001). It might have been possible to prevent the bank panic with the introduction of a deposit guarantee announced simultaneously with the bankruptcies. However, the guarantee announced nearly three months later was almost ineffective.

Malaysia rode out the Southeast Asian crisis without freezing deposits and closing banks down, but its method of crisis management has been one of the most debated chapters of the crisis literature of the region. In September 1998 the Malaysian government decided to take an unusual step: together with other measures, it introduced capital controls in

order to prevent further withdrawal of capital. In fact, however, most of the movable capital had already left the country by then, so the limitation was not really effective. Nevertheless, it helped in the successful reduction of the speculative pressure on the exchange rate and in fixing the exchange rate. As a result of the measures, although the costs of Malaysia's borrowing increased, since capital controls were maintained only for a relatively short period of time, the effect remained moderate (Meesook et al., 2001). The Malaysian case subsequently overcame international organisations' resistance against the temporary controls on short-term capital movements; in 2008, the IMF also permitted Iceland to take a similar approach.

## EXCHANGE RATE AND INTEREST RATE POLICY

Traditional monetary policy instruments play a very important role in times of crisis management as well. Their applicability is limited by the fact that the central banks in the countries under review often faced a dilemma related to currency mismatch. The underlying reason is that although the weakening exchange rate improves export competitiveness, at the same time it adds to the repayment burden of agents indebted in foreign exchange without hedging the exchange rate risk. On the other hand, the raising base rate in order to protect the exchange rate leads to an increase in the domestic interest rate level, which affects agents who have borrowed in domestic currency. Accordingly, the vulnerability of the banking sector increases in both cases.

In the case of currency mismatch and depreciation pressure on the domestic currency, managing the liquidity crisis of the banking sector may also present a dilemma for the monetary authority. Direct liquidity support in domestic currency helps to solve the short-term liquidity problem of the banking sector, but at the same time pressure on the domestic currency in the foreign exchange market also strengthens. In some banking crises, central banks chose extreme solutions in this situation: they preferred the protection of the exchange rate, and did not provide liquidity at all, or they considered the short-term health of the banking sector as paramount, and provided unlimited liquidity in domestic currency, allowing the exchange rate to depreciate considerably. In the event that a central bank provides liquidity in foreign exchange for closing the open foreign exchange position of the banking sector, it does not generate any additional depreciation pressure.

Based on the experiences of the countries examined, neither one of the extreme policies is expedient for handling the situation. Substantial depreciation may become an

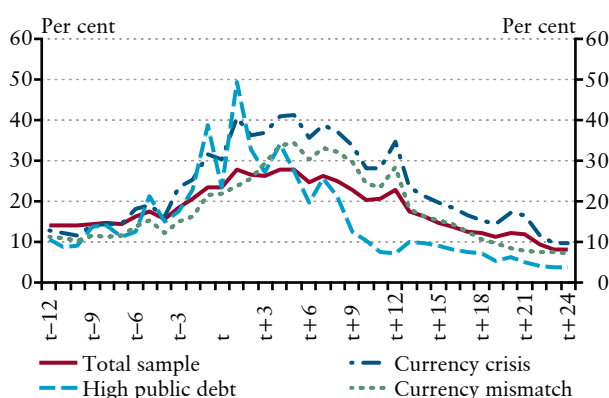
uncontrollable, self-inducing process, and may cause serious damages in an economy with unhedged exchange rate positions. The depreciation pressure on the exchange rate cannot really be mitigated with an announced devaluation within a controlled framework either; the initial depreciation of the exchange rate typically exceeds the intended extent. Countries operating fixed or quasi-fixed exchange rate regimes before the crisis are usually compelled to switch over to a floating exchange rate regime in the end.

The protection of the exchange rate at any price, for example with foreign exchange market interventions and the withholding of liquidity, cannot be ensured over the long term; it may reduce central bank reserves to a critical level and render the banking sector illiquid. Therefore, in situations like this it is expedient to open all valves in a controlled manner, i.e. to provide liquidity to banks and allow the domestic currency to weaken to some extent. The central bank may try to keep the ensuing depreciation pressure within a controlled framework by raising the interest rate. However, experiences suggest that it is not worth overdoing it either: a nominal interest rate that settles at an extremely high level (of 25–30 per cent or higher) for a long time exacerbates the decline in the real economy.

In addition to avoiding extremes, timing is also highly important: the same step taken at different times may send completely different messages to the markets. Raising the interest rate as a response to exchange rate depreciation may let the market know that decision-makers have a good grip on the situation and are able to react professionally and quickly. However, in view of the real economic consequences, it is not expedient to keep the interest rate level permanently high, so the proper timing for lowering it must also be found. Starting interest rate cuts too early may be followed by renewed weakening of the exchange rate, which in turn may warrant raising the interest rate again. This kind of cyclicism adds to uncertainty, and undermines the credibility of the central bank.

Chart 2

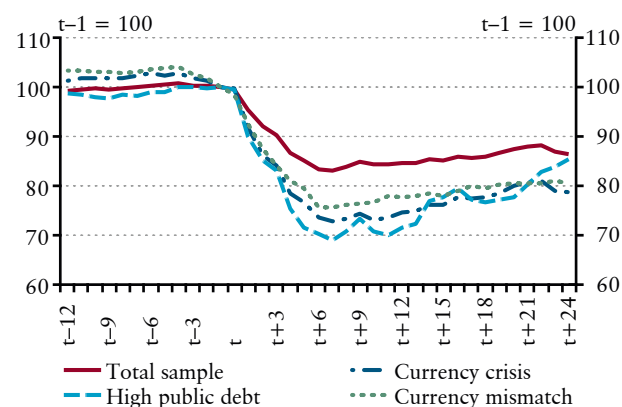
### Monthly developments in the nominal money market interest rate<sup>6</sup>



Source: IFS.

Chart 4

### Monthly developments in the real exchange rate (real depreciation downwards)

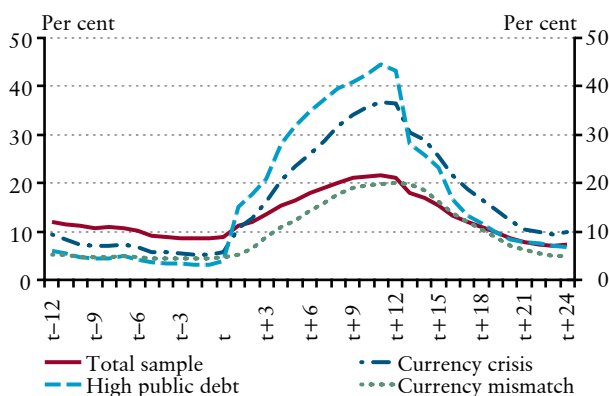


Source: IFS.

Chart 3

### Monthly developments in inflation (annual change)

(annual change)



Source: IFS.

All of this can be illustrated with the sample containing 30 countries presented above. The months around the eruption of the crisis were usually characterised by a significant increase in the interest rate level on the money market, with the interest rate hikes carried out by the central bank to protect the exchange rate also contributing to this (Chart 2). During the year following the crisis, a decline in the interest rate is seen, although this temporarily entailed higher inflation (Chart 3). The temporary acceleration in price

increases may basically be attributable to the drastic depreciation of the exchange rate, and thus to the pass-through effect of import prices.

Based on the real effective exchange rates or – where the effective exchange rate was not available – on the real exchange rates against the US dollar, the first month of the crisis was followed by depreciation (Chart 4). As regards the magnitude of depreciation, compared to the average of the whole sample, high public debt, unhedged foreign exchange positions and (not surprisingly) the currency crisis are exacerbating factors. Depreciation proved to be prolonged in each case; only partial correction could be observed in the following year. Overall and on average, a permanent real exchange rate depreciation of around 15 per cent ensued.

Based on the sample, the real depreciation materialised mainly through the accommodation of the nominal exchange rate. Prolonged protection of fixed exchange rate regimes failed, although some countries (for example Sweden) achieved temporary successes in this field. Despite interpreting the abandonment of exchange rate fixing as an economic policy failure in many cases, this was exactly what paved the way for the export-driven economic upswing which played an important role in the recovery.

<sup>6</sup> In the presentation of the developments in the real interest rate and the real exchange rate  $t$  indicates the first month of the crisis, while in the other charts  $t$  is the year of the crisis, based on the database of the IMF. The titles of the above mentioned charts also indicate the monthly frequency of the data. In order to make the charts transparent, outliers were excluded when necessary.

**Box 2: Interest rate and exchange rate policy during banking crises**

Although Sweden was in a relatively favourable economic situation when it was hit by the banking crisis, crisis management was hampered by the international crisis of the common European exchange rate mechanism (ERM). The banking crisis made the Scandinavian countries special targets for speculation; the Swedish central bank was forced to raise the interest rate in several steps. On 9 September 1992, one day after the launch of the floating regime in Finland, the Swedish interest rate was raised to 75 per cent in order to fend off the speculative pressure. In the middle of September, the United Kingdom and Italy left ERM, while the Swedish overnight interest rate was raised to 500 per cent for a few days in order to protect the exchange rate. The central bank provided liquidity for banks and started to cut the interest rate, but the speculative pressure strengthened again in November (Englund–Vihriälä, 2003). Then, the central bank raised the interest rate to 20 per cent, and carried out a significant foreign exchange market intervention, but finally it had to abandon its fixing of the krona on 19 November. The krona depreciated by 9 per cent immediately. Nevertheless, the initially applied quick and significant interest rate hike can be considered positive from a communication aspect: the central bank reacted firmly, which indicated to the markets that it was

committed to preventing exchange rate depreciation. All this may have contributed to the fact that uncontrollable depreciation did not subsequently occur.

In the crisis in Turkey in 2000, the dilemma of the protection of the exchange rate – and thus that of economic agents exposed to the exchange rate position – as well as the maintenance of the domestic liquidity situation and the reduction of the interest rate level was displayed in a very extreme manner. The rigid insistence on maintaining the currency board (the central bank did not provide liquidity support for banks) resulted in the escalation of the liquidity crisis and a surge in yields to an unrealistically high level (1000–2000 per cent), which, in turn, only strengthened the expectations regarding the unsustainability of the system and the panic. Following the announcement of the free float, the lira depreciated 50 per cent in one month; consequently, banks with significant exchange rate exposure suffered further losses. In the case of the Turkish crisis, insisting on the exchange rate level proved to be unsuccessful, whereas if the central bank had provided liquidity for the banks early in the process, perhaps it could have avoided the complete drying up of the interbank and government securities markets.

**REAL ECONOMIC EFFECTS AND THE BANKING SECTOR**

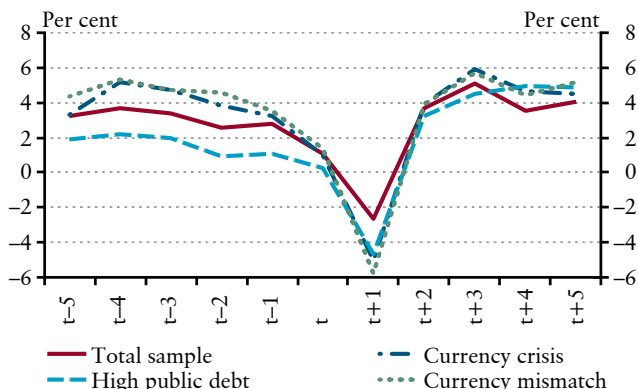
Banking crises in the crisis periods analysed resulted in a temporary decline in economic growth. Real economic performance, if measured by the growth rate of GDP, apparently recovered quickly from the effects of the crisis. Real GDP expanded again in the countries concerned relatively rapidly, as early as the second year following the crisis (Chart 5). Strong depreciation of the exchange rate played an important role in the upturn in growth, which was export-driven in many cases. However, in the current global crisis the possibilities for export growth are limited; therefore, the recession may be more protracted compared to earlier crises.

Another analysis, which was also conducted on the basis of the IMF database, yielded a similar result: the output of the economy reached the pre-crisis level in 2 years the latest in half of the cases (Cecchetti et al., 2009). This means that it took typically this much time for the economies to recover from the damages caused by the banking crisis. However, it is worth calling attention to the fact that the very quick

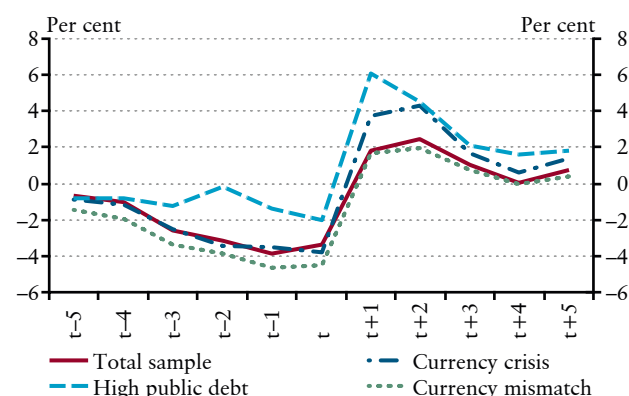
recovery of the Southeast Asian countries strongly affects the average values; the revival of growth was much slower in other regions. In evaluating the results, caution is warranted because none of the banking crises examined took place amidst circumstances of a global financial crisis and recession similar to the current ones. Another important conclusion of the aforementioned study is that if the banking crisis is coupled with a currency crisis, it may lengthen the economic recovery by one and a half years on average.

The conclusions are less optimistic if the macroeconomic costs of the banking crisis are measured by the cumulated output loss compared to the pre-crisis trend.<sup>7</sup> The accumulated output loss during the crisis and the subsequent three years reaches 25 per cent as an average of all the countries examined, while for the subsample with the unhedged foreign exchange position it reaches as much as 40 per cent, which is considered significant. The sustained increase in unemployment confirms that the social costs of the banking crisis appear for a much more protracted period of time than what is suggested by the decline in real GDP (Chart 6).

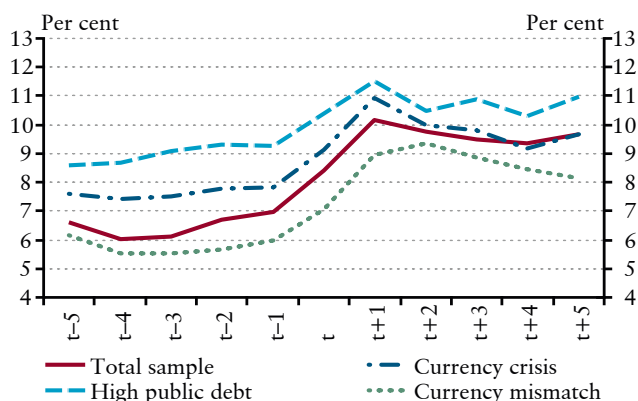
<sup>7</sup> In order to quantify the output loss, the real GDP trend up until the crisis is projected for the following three years, and the deviations of actual real GDP from this trend are summed up. The problem with this indicator may be that crisis episodes are often preceded by an overheating economy, so due to the performance of pre-crisis years the trend – and thus deviation from the trend as well – is probably overestimated.

**Chart 5****Real GDP growth rate**

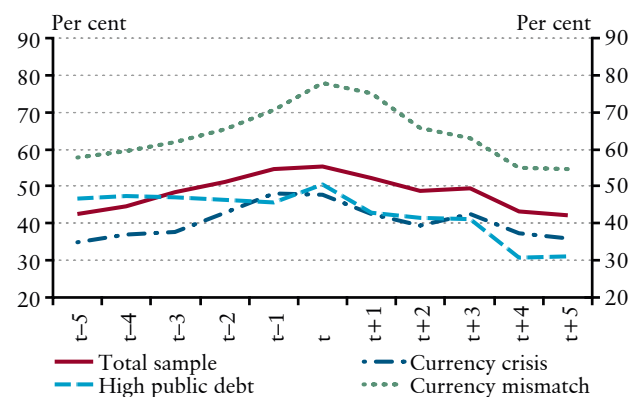
Source: IFS.

**Chart 7****Current account balance as a percentage of GDP**

Source: IFS.

**Chart 6****Unemployment rate**

Source: IFS.

**Chart 8****Loans to the private sector as a percentage of GDP**

Source: IFS.

Before the crisis, the current account showed a permanent deficit in all subsamples, which is in line with the fact that the sample countries are mainly emerging ones highly dependent on external sources (Chart 7). In the two years following the crisis, the current account turned into a surplus in all subsamples, which is not surprising, as the crisis was almost always triggered by the blocking of external financing. Consequently, the current account surplus is not a 'success', but rather a sign of forced adjustment (extra savings).

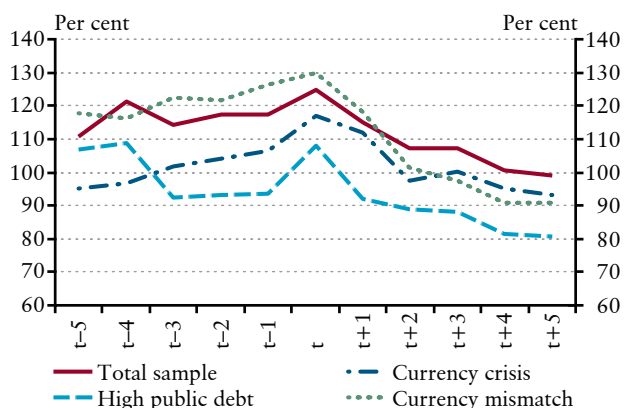
In the sample, the decline in the net external financing requirement was accompanied by adjustment in net exports: exports grew faster than imports in the years following the crisis. The increase in exports may be attributable to exchange rate weakening, while weak imports reflect the effect of restrained consumption and lower investment dynamics, in addition to the exchange rate.

In the episodes analysed, total loans to the private sector as a proportion of GDP declined for a relatively longer period of time following the crisis; in the countries that experienced a banking crisis the ratio of total loans sank to a much lower level than the one characterising the year of the crisis (typically to 70–80 per cent of that of the year of the crisis) (Chart 8). This underscores the probability that the adjustment of the real economy takes place faster than that of financial intermediation, i.e. a more permanent slowdown can be expected in the process of financial deepening than in real economic activity.

The ratio of bank loans to deposits was high in the sample examined. In banks' financing structure this indicates that the role of the money market and external financing was significant (Chart 9). If the share of external funds is high within the liabilities of the banking sector, banks become exposed to the changes in international risk tolerance.

Chart 9

## Loan-to-deposit ratio



Source: IFS.

Based on the sample, the increase in the loan-to-deposit ratio typically came to a sudden halt in the year of the crisis, and declined by around 15–20 percentage points in the next two years. Accordingly, the banking sector attempted to lower its dependency on external funds and the ensuing vulnerability. Overall, as a result of the crisis, permanent processes started in the banking sector, meaning a shift to a more conservative financing structure and business policy.

## CONCLUSIONS

The effect of the current global financial crisis was felt through several channels in Hungary. The unfolding liquidity crisis was successfully contained by using the stand-by credit facility of international organisations as well as by central bank and government measures. As a result of the events, similarly to other parts of the world, more emphasis is laid on financial stability aspects in economic policy decision-making in Hungary as well; in addition, there is an increasing need to review the knowledge which has been accumulated so far in connection with banking crises. Our article represents a contribution to this, using the international database of the researchers of the International Monetary Fund.

Based on the experiences from the selected crisis episodes, a wide range of means is available for authorities to manage the initial liquidity phase of a crisis. It is difficult, however, to draw conclusions regarding the success of crisis management. Estimates for frequently used indicators, such as fiscal costs or the magnitude of the output loss of the economy, involve a high level of uncertainty. Moreover, one cannot know whether the realised cost is a result of a series of successful measures avoiding a potentially even higher loss or the consequence

of the incorrect handling of an originally smaller problem. It can, however, be established that decision-makers rarely resort to really drastic means.

The summary of the experiences of the countries examined can be that extreme monetary policy responses are not expedient. A substantial depreciation may become a self-inducing process, and may cause serious damages in an economy with unhedged exchange rate positions. On the other hand, defending the exchange rate at any price is not possible over the longer term by, for example, foreign exchange market interventions and restraining liquidity. Instead, it is worth providing liquidity for the banking sector and, in addition, allowing some depreciation of the domestic currency.

In the case of the crises in the sample the lesson to be drawn from the changes in macroeconomic variables is that the real economy recovers from the crisis relatively quickly. Nonetheless, the lasting increase in unemployment and the magnitude of the output loss indicate that the social costs may appear over a much longer period of time. The global character of the current financial crisis and the narrowing export markets do not allow a rapid, export-driven recovery, which was typical in the past, which may also lead to the protraction of the economic downturn.

Following the eruption of the crisis, the banking sector attempts to reduce its vulnerability, which is well reflected in the data in the analysis. If necessary, banks alter their respective financing structures and rely on external funds to a lesser extent. This may also result in a decline in loans to the private sector. Considerable currency mismatch may project a greater extent of adjustment. Overall, the conclusion that can be drawn on the basis of the sample is that the developments observed within the banking sector proved to be permanent, in which the second phase of banking crises, a possible restructuring of the banking sector may already have played a role.

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## ANNEX: GROUPING OF CRISIS EPISODES

**Table 1**

### Grouping of crisis episodes

Country	Crisis date	Currency crisis	High public debt	Currency mismatch
Argentina	1995	×	×	×
Argentina	2001	✓	✓	✓
Bolivia	1984	×	✓	NA
Brazil	1990	✓	×	NA
Bulgaria	1996	✓	✓	NA
Chile	1981	✓	NA	✓
Colombia	1998	×	×	NA
Croatia	1998	×	×	✓
Czech Rep.	1996	×	×	NA
Ecuador	1998	✓	✓	×
Estonia	1992	✓	NA	NA
Finland	1991	×	×	✓
Indonesia	1997	✓	×	✓
Japan	1997	×	✓	✓
Korea	1997	✓	×	✓
Latvia	1995	×	×	NA
Lithuania	1995	×	×	NA
Malaysia	1997	✓	×	✓
Mexico	1994	✓	×	✓
Norway	1991	×	×	×
Paraguay	1995	×	×	×
Philippines	1997	✓	✓	✓
Russia	1998	✓	✓	×
Sweden	1991	✓	×	✓
Thailand	1997	×	×	✓
Turkey	2000	✓	✓	✓
Ukraine	1998	✓	×	NA
Uruguay	2002	✓	×	✓
Venezuela	1994	✓	NA	×
Vietnam	1997	×	NA	NA

Note: ✓ indicates that a country belongs to the given group; NA means we could not find information.

Sources: Laeven–Valencia (2008) and own data collection.