INTRODUCTION

The current financial crisis has shed new light on the issue of whether, in the course of performing their tasks, central banks should consider asset price booms and financial imbalances (APFIs), which seem to be untenable, and if so, in what way. Following an outline of the global environment, this study presents a summary of the recommendations made in the international literature. Subsequently, APFIs are interpreted within a Hungarian context, i.e. variables which may be APFIs in the Hungarian economy are compiled in the light of past experiences and the developments expected in the future. Based on international experiences, a summary is given of the means that can be useful for the management of APFIs within the framework of monetary strategy. The purpose of this study is to provide a brief summary of the most significant issues and we have focussed on issues related to the implementation of monetary policy. For this reason, the financial stability (macro-prudential policy) issues are tackled only at points of contact. These will be shaped by subsequent decisions by the central bank and the government in the light of recent experiences.

Changes in the international business cycle

The period immediately preceding the current crisis is termed in the literature as the ‘Great Moderation’. This term suggests that a growth period which was rapid and long in comparison to the earlier periods was experienced in conjunction with price stability, not only in the most developed countries but also in emerging ones. This macro-economic stability, however, failed to result in macro-financial stability: cases of instability were encountered in increasing numbers even in developed countries. The novelty in this scenario was that episods of financial instability took place at low inflation rates.

Over the past few decades, economies have undergone structural changes and current economic policy regimes are also different; this is reflected in the new features of the business cycles. Inflationary pressures build up slower and over a longer time. Deflation has appeared as a genuine threat once again. Previously, an upturn was typically halted by central bank tightening in reaction to deterioration in the inflation outlook. In the recently observed growth fluctuations, however, the most significant driving factor was indebtedness (especially by households), and its subsequent adjustment, often without central bank actions. Previously, corporations were the most indebted economic agents, while recently households have been developing increasing significance in this field. Household investments react quickly to easing in the monetary stance and slowdowns in growth, and adjustment by corporate investments has also accelerated. In developed countries, uncertainty has increased in relation to the pace of productivity growth, and investment activity is less robust than previously. As a result of increased capital flows, the increased significance of institutional investors and the spread of derivative instruments have also contributed to financial imbalances.

One fundamental lesson of the financial crisis is that the evolution of financial imbalances may suggest overheating in the economy, which does not necessarily entail a rise in inflation. The bursting of these bubbles may result in an abrupt overshooting of the positive output gap in the opposite direction, in other words, it can lead to a severe recession. Thus, in addition to inflation and growth forecasts, central banks endeavouring to stabilise income fluctuations need to develop new indicators which are suitable for grasping the output gaps which evolve during the development of financial imbalances. This would require models that capture shocks in the banking systems and financial frictions in an endogenous way, but such models are still in their infancy. Over the short run, the only feasible opportunity is to derive indicators with good forecasting qualities directly from the indicators that characterise the imbalance, which are then considered by the Monetary Council in the form of expert information during the decision-making process. There is no need to change the framework of inflation targeting. However, in the future greater emphasis should be laid on the fact that anchoring inflationary expectations is a necessary, but not sufficient prerequisite to creating macro-economic stability, and that measures taken to avoid financial imbalances help to dampen income fluctuations. As the usual instruments are highly inefficient for stabilising the output gap caused by financial imbalances, the occasional application of macro-prudential instruments needs to be considered.

Ágnes Csermely and Zoltán Szalai: The role of financial imbalances in monetary policy*

* 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.
The significance of APF is for the central bank goes beyond International Monetary Fund (2000), Borio et al. (2002a) and Borio et al. (2003). Such cases included the following: Japan (1980s), Scandinavia and the United Kingdom (early 1990s), USA (2000–2003), EU/euro area (2001–2005).

Problems caused by APFIs

APFIs often simultaneously cause problems from the perspective of macro-economic stability and financial stability. Naturally, macro-economic problems caused by APFIs while the banking sector remains stable are conceivable (such are pure exchange rate crises or fiscal crises), and vice-versa: crises merely affecting the financial sector can take place without significant effects on the macro-economy. Whatever the direction of the shock, a problem in one part may lead to problems in the other, if it is sufficiently sizeable or lasting. Protracted periods of slow growth will sooner or later result in the deterioration of credit portfolios and declining profitability in the financial sector, which in turn may lead to financial instability. Similarly, a weak and instable financial sector is incapable of discharging its function of financing the economy and managing financial risks, which in turn results in a slowdown in growth and ultimately macro-economic instability.

In the following, this study focuses on considerations supporting the notion that monetary policy focusing on price stability as its primary objective needs to pay serious attention to APFIs prior to a crisis as well, when financial imbalances are in the phase of developing. In other words, the significance of APFIs for the central bank goes beyond the achievement of financial stability.

The problems caused by APFIs in macro-economic stability result from overheating in the economy and its subsequent, extremely rapid adjustment. The adjustment of such overheating can result in reductions in both the price level (deflation) and GDP (recession, depression), which in turn may result in heavy social costs. Thus, the nature of the social welfare losses caused by APFIs is very similar to traditional overheating, which generates inflationary pressure. In both cases, losses are due to the inefficient allocation of resources, and the central bank endeavours to reduce this failure (the objectives related to financial stability may have far wider scope).

The principal novelty lies in the fact that in the previously characteristic business cycles overheating usually entailed inflationary pressure, and thus inflation forecasts provided adequate indications for decision-makers. In the current economies, however, overheating frequently appears in the form of APFIs, while very often no inflationary pressure is seen over the currently customary 1- or 2-year monetary policy horizon. On the contrary, stable, low inflation rates are favourable for the build up of positions which result in instability. Another difference is that the risk of deflation, in other words, undershooting the inflationary target, is higher.

The following are typical allocation-related problems in the case of overheating:

a) Excessive investment in certain sectors (e.g. construction industry) and at the aggregate level, which cannot be maintained over the long term. If excessive investment is accompanied by significant indebtedness, adjustment may be particularly costly, as widespread bankruptcies may ensue.

b) With a drop in net financial savings to a low level, consumption may increase excessively, and overcapacities may be created, and this may trigger pro-cyclical financial adjustment in the period of correction.

c) The government’s budgetary revenues: in the period of APF-generated overheating, it is difficult to separate cyclical and permanent increase in the revenues; therefore governments may deem the sustainable level of expenditure to be higher. As reversing this development also requires pro-cyclical measures and is politically more difficult, there is a risk of an uninterrupted increase in public debt.

d) The banking and financial system lends in a pro-cyclical manner, as during upturns the balances of the economic participants are stable, asset prices rise, their collateral value increases, and volatilities decline. Both upward and downward flows are self-reinforcing, and are in interaction with the real sector as per above.

Thus, in every significant aspect APFIs have effects that are similar to those of inflation: they cause macro-economic volatility considered to be a market failure, and public policies – including monetary policy – are expected to make efforts at smoothing them out.

The crisis has not cast doubt on the fact that the central bank can react to growth only to the extent it does not jeopardise price stability (anchoring of inflationary expectations). However, we must learn that keeping inflation low is not

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1 International Monetary Fund (2000), Borio et al. (2002a) and Borio et al. (2003). Such cases included the following: Japan (1980s), Scandinavia and the United Kingdom (early 1990s), USA (2000–2003), EU/euro area (2001–2005).
enough; the central bank must take additional actions to create macro-economic stability. In the course of making monetary decisions, it must be taken into consideration that in contrast to “traditional” overheating, inflation forecasts do not provide sufficient information for decision-makers in the case of overheating evolving during the formation of financial imbalances, and for this reason new indicators need to be sought in addition to the existing ones.

**INDICATORS OF IDENTIFYING OUTPUT GAPS EVOLVING DURING THE DEVELOPMENT OF FINANCIAL IMBALANCES**

As the overheating caused by financial imbalances becomes manifest only after a longer time, the first recommendations urge the central banks to incorporate them in their strategies by extending the forecast horizon. With the currently used tools of analysis there is hardly any sense to mechanically extend the horizon of analysis, because once shocks are over, these models return to the trend and fail to give a new insight. The other group of early recommendations was directed at the inclusion of asset prices into the price index representing the central bank’s objective, e.g. a real estate price index. However, asset prices are far too variable, and not all asset price booms are equally risky. The most recent research findings tend to stress the significance of financial imbalances and credit aggregates. Asset price hikes are really dangerous only if they entail unusually rapid credit increase, current account deficit and currency mismatches in the balance sheets of the agents.

The most obvious solution would be the development of central bank tools typically used for monetary policy analyses to give a more accurate picture of the risks jeopardising macro-economic stability. Efforts have already been made to incorporate the financial sector in the macro-economic models, and several simplifications are being removed (non-linearity is allowed, heterogeneous participants are introduced, rationality assumptions are eased, etc.). Despite their more complex nature, for the time being these models can only grasp the way the financial sector participates in the spread (propagation) of shocks and the ensuing amplifying effects, but are only able to depict the build-up of APFIs to a limited extent.

Thus, for the time being the only solution applicable in practice is to complement traditional monetary policy analyses with the monitoring of a combination of simpler and more robust indicators, as they can indicate the development of fragilities and the formation of instability in good time and with few ‘false alarms’ (noise). At the moment, the approach adopted by Borio et al. is the closest to application by central banks, and in the World Economic Outlook published in autumn 2009 the IMF authors applied a similar approach.

Instead of making efforts at the elaboration of a closed model, they rely on a group of indicators to grasp potential APFI-related risks. Their approach meets the requirement that timely indication should be made for the economic policy in order to prompt action on the basis of the simultaneously available data. The ratio of “false alarms” to the total amount of “alarm signals” is reasonably low. A relatively simple, rule-based policy can be based on it, although this approach, like any other, cannot completely do without discretion. Its basic concept is in agreement with the experiences that financial instabilities develop in an endogenous way over a longer period, and there is interaction between the real and financial sectors. For developed countries, the best forecasts were provided by a combined indicator comprising the home price index, the stock exchange share index and the pace of credit growth, and simply indicated positive departure of the listed variables from their own trends above a threshold set on the basis of estimation from past data. If only two of these three indicators were included in the index, the efficiency of the forecast dropped. Inclusion of credit aggregates was required in each combination: on their own, asset prices – share or home prices – proved to be less reliable, and massive downturns were less likely to follow the bursting of such bubbles if they were not accompanied by a marked increase in indebtedness.

**IS ANY CHANGE NEEDED IN THE CENTRAL BANK’S BEHAVIOUR WHEN THE DEVELOPMENT OF APFIS IS OBSERVED?**

The most conservative approach urges central banks to focusing on mopping up only after bubbles burst, and not to make efforts at preventing their development or bursting them (’Do not lean, just clean!’). In this approach, central bank officials are neither capable of reliably determining the time when a bubble has formed, nor do they have the means to offset it reliably and at a reasonable cost even if they could determine such cases.

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2 A recommendation is made for the required changes in Cecchetti et al. (2009).
3 Borio et al. (2002a), (2002b) and (2009a).
4 The most well-known advocate of this approach was Alan Greenspan during his mandate as governor of the Fed.
Several arguments can be brought forward against this approach:

– although not with absolute precision, but with an accuracy similar to other accepted indicators (for instance, estimating the output gap), APFI-related problems can be identified. Today there are examples of successful management of overheating in reaction to APFIs by central banks at not very high costs (e.g. the way the Australian central bank managed the real estate bubble in 2003).

– As shown by the current crisis, ‘mopping up’ is occasionally far more costly than thought prior to the crisis.

– Moreover, this approach boosts the assumption of excessive risks by the financial markets, as they can expect stabilising intervention by the central bank (moral hazard).

Prior to the crisis, the most wide-spread approach was to expect the central banks to react only when and to the extent the overheating caused by APFIs actually appeared in the inflation forecasts. However, APFIs can cause overheating with no concomitant increase in inflation forecast, at least not over the currently typically time horizons. However, most central bank models include smoothing the output gap by the central bank in their loss functions, and it is optimal not to react directly to the output gap (as reflected anyway in the rise in the inflationary forecast) only with certain assumptions. Thus, if the link between the APFIs and the output gap could be discerned, the information offered in APFIs and the moderation of welfare losses resulting from APFIs could be inserted in the framework of traditional analysis.

However, the presence of APFIs also makes the estimation of the output gap far more difficult. Because growth may be faster along with lower inflation rates over the longer term, analyses performed with traditional tools will suggest that the pace of potential output growth has accelerated faster than what is sustainable over the long run whilst at the same time maintaining price stability and financial stability. This difficulty should not lead, however, to the conclusion that APFIs need to be disregarded: their effect is present regardless of whether they are taken into consideration or not, and so we need to find better estimation methods.

The third proposal recommends that central banks react to APFIs directly with their usual interest rate instruments just as they have in the past in response to inflation (‘lean against the wind’).

Such a preventive monetary policy course would differ from the ‘Do not lean, just clean’ strategy in that it wishes to adopt tightening measures sooner on seeing APFIs, but if nevertheless, the undesirable event cannot be prevented, this approach would also ease conditions sooner and more intensively, as higher potential macro-economic losses are expected. Therefore, this would be a symmetrical policy.

The central bank’s leaning against the wind attitude is not free of problems either: the effects of interest policy measures are felt over various horizons: it affects the bubble instantly, and the output gap with a delay. In cases when the economy would require low interest rates before a negative output gap develops as a result of bubble bursting, by the application of low interest rates, the central bank delays bursting of the bubble and facilitates its further inflation. For this reason, the central bank must react to APFIs right at the beginning of its evolution – a task most experts consider impossible. Many people who otherwise consider central banks’ reaction to APFIs to be desirable think that the interest rate is not the most suitable instrument for this purpose.

USE OF NON-CONVENTIONAL INSTRUMENTS IN THE INTEREST OF MAINTAINING MACRO-ECONOMIC STABILITY

If interest rate policy is inefficient or not the optimum instrument – because it too costly – for mitigating the macro-economic risks engendered the APFIs, the application of so-called non-conventional instruments may be expedient. The latter fall into two major groups: the application of prudential regulation for monetary policy purposes, and the use of balance sheet instruments by the central bank.

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1 Cecchetti et al. (2000), Borio and Lowe (2002), Borio et al. (2009).
2 The most influential representatives of this approach included Bernanke and Gertler (1999, 2001).
3 Central bank officials are expected to receive ‘this time is different’ kinds of arguments highly sceptically, as there are sufficient reasons in every permanent upturn for explaining why growth is different or faster and less dangerous now than it was previously.
4 Cecchetti (2006).
5 Cecchetti (2006).
From the perspective of macro-economic stability, prudential regulation used for monetary policy purposes\(^\text{10}\) can be considered as an institutional operative framework that confines the activity and risk taking of economic participants for the most part irrespectively of the business cycle, and moderates the two-ways amplifying effects (i.e. “pro-cyclicality”) effects generated by the financial intermediaries. Certain prudential instruments can be changed cyclically. However, without long-term growth sacrifices this framework cannot be calibrated so tightly that traditional anti-cyclical monetary policy becomes unnecessary. Furthermore, interest rate policy has an effect in segments not easily reached by prudential policy (certain financial market segments). Traditional monetary policy instruments and a reinforced prudential institutional environment can efficiently moderate excessive macro-economic fluctuations generated by APFIs if they are applied in combination.

The balance sheet as a central bank policy instrument includes tools which are not considered usual today, but which are, as a result of the crisis, widely applied and some of these are likely to remain part of the usual policy instruments. These instruments aim to increase the efficiency of monetary policy transmission and to promote the monetary conditions which the central bank considers appropriate in the particular market. They may be required if the central bank considers the traditional transmission mechanism (in which the central bank indicates the future monetary policy stance by influencing short-term interest rates, in order to have them appear in long-term market interest rates) insufficient. Balance-sheet instruments allow the central bank to influence these conditions without changing the short-term interest rates (“decoupling”). Naturally, the efficiency of such actions depends greatly on the liquidity of the particular market. Traditionally, such areas include the FX market for example, where central banks frequently wish to change prices by FX market interventions of other volume-related interventions while leaving the interest rate differential unaffected. One novelty among central bank instruments used in reaction to crises is the fact that in non-FX market segments, such as the market of interbank reserves, central banks are applying balance-sheet instruments instead of or in addition to interest rate measures.

Emerging Market Features

Due to FX debt, small and open economies (Emerging Market Economies – EME) are exposed to balance-sheet risks in nearly every sector. Exchange rate changes can make the balance sheet fragile quickly for many participants. In empirical studies, the exchange rate was a significant early warning indicator for emerging market economies, while the stock exchange index was not (in developed countries the opposite was the case).\(^\text{11}\) As another peculiar feature of EMES, in contrast to developed countries where APFIs usually result from endogenous development, emerging countries frequently experience capital flow and risk premium shocks exogenous to them, which do not have anything to do with the particular country’s fundamentals; rather they are likely to arise from the risk assumption changes and contagion in the international capital market.

Thus, the special features of EMES lie in the fact that special attention must be paid to the management of risks related to FX exposure and international capital flows. In these countries, the applicability of interest policy is even more questionable than in developed economies. When APFIs are noticed, central bank instruments are fundamentally required to cool off the economy, but interest hikes increase interest rate differential vis-à-vis other countries and this may boost capital inflows or render the evolution of desirable monetary conditions more difficult.\(^\text{12}\)

Intervention and restrictions on capital flows are classic instruments in managing capital flows and exchange rate fluctuations. In this field, the most recent proposals recommend a more active use of macro-prudential regulatory instruments: attempts are made at slowing these developments by making it more difficult to re-channel volatile resources through the banking system. These include higher reserve requirements set for banks’ foreign resources and tight compliance requirements on the maturity structure (restrictions on mismatches), but even regulations tightening lending conditions may have moderating effects on capital flows.

APFI in Hungary

Looking at the recent past, balance-sheet fragility resulting from increasing exposure to capital flows, and the fast increase in credit and indebtedness in FX can be seen as indications suggesting the development of financial imbalances, whereas no excessive rise was seen in asset prices. This is to say that in respect of APFIs, only the FIs (financial imbalances) suggested overheating, while the APs (asset prices) did not. In addition to these APFI-type

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\(^{10}\) Increasing the absolute level of capital requirements and their anti-cyclical changes, setting liquidity limits, limiting FX openness in the balance sheets, restriction on the size of institutions and their scope of activities in order to reduce their complexity and the moral hazard involved in them if they have access to the instruments of the ‘ultimate lender’, regulation of the credit collateral ratios and their anti-cyclical changes, etc.

\(^{11}\) Home prices proved to be significant in Asia in the analyses of another researcher (Gochoco-Bautista, 2009).

\(^{12}\) See De Gregorio (2009).
indicators, the current account deficit and high inflation were also indicative of overheating in the economy. Thus in contrast to the problems faced by the advanced countries, more consideration of APFIs would not have yielded more information for monetary policy, although it would have furnished additional information for the analysis of financial stability, which is not discussed in detail in this study. From the perspective of monetary strategy, the question is rather the following: if overheating is accompanied by the build-up of APFIs, could the simultaneous use of non-conventional instruments have made monetary policy more effective?

The application opportunities of macro-prudential instruments were considered restricted primarily for the reason that Hungary has been integrated in market as well as institutional terms, and thus international effects cannot be disregarded. For this reason, Hungary’s options were seen as being limited by international commitments as well as practicability (regulatory arbitrage, efficiency and competition-related considerations, etc.). In respect of central bank balance-sheet instruments, the efficiency of intervention was deemed doubtful on the basis of empirical studies of developed countries, and our experiences gained in the period of fixed exchange rate regimes.

The period ahead will bring changes and, in compliance with the international initiatives, the application of macro-prudential instruments is expected to gain more ground. At the same time, in a country with a completely liberalised market and a financial system integrated into the international financial markets, the efficiency of intervention remains doubtful. Experiences from less integrated EMEs shed light on the fact that an intervention policy directed at the sterilisation of capital flows may lead to rapid reserve accumulation, which requires extremely high direct fiscal costs.

**HOW DO APFIS FIT INTO THE MONETARY POLICY FRAMEWORK IN HUNGARY?**

The best approach to the monetary policy objective is to make efforts to smooth both inflation and GDP fluctuations. More specifically, the primary task is to anchor inflation in order to contribute to GDP stabilisation without jeopardising anchoring. If we accept that the development of financial imbalances carries the risks of deflation and significant fluctuations in economic growth even under conditions approximating price stability, the central bank’s primary objective clearly includes the mitigation of welfare losses caused by APFIs.

Inflation targeting provides an appropriate framework for achieving this objective. Inflation targeting is a monetary framework in which the primary objective of monetary policy is to provide the economy with a nominal anchor. It attempts to achieve this objective by stabilising long-term inflationary expectations at a low level. To this end, the following steps are taken:

- A numeric inflationary target is set, around which the central bank wishes to anchor expectations.
- In the course of making its decisions, the central bank primarily takes the long-term effects into consideration.
- Credibility is built up in order to strengthen economic participants’ confidence that inflation will actually reach a level at around the targeted rate. The following are key elements in building credibility:
  - political independence;
  - transparent, convincing communication of monetary policy measures;
  - achievement of the target.

These attributes do not limit the MNB in its reactions to financial imbalances. It must be seen, however, that achievement of inflationary objectives is not the only task which the central bank must perform. Macro-economic stabilisation frequently requires monetary measures which are difficult to explain with developments exclusively in the inflationary outlook. For this reason, the wider public needs to be made aware of the fact that it is incorrect to believe that the essence of inflation targeting is a mechanical decision-making rule including a single variable, namely the inflation forecast over a fixed horizon. Actually, inflation targeting (IT) was set up in denial of the monetary frameworks based on a single variable (exchange rate, monetary aggregates), assuming that all relevant information affecting future inflation and the growth trajectory must be taken directly into account. Generally, the inflation forecast properly concentrates these pieces of information, but as mentioned above, in modern economies it is more and more often the case that such information appears primarily or occasionally in APFIs, and this is why they must be taken into consideration in addition to the present indicators.

In light of the above, APFI-related considerations do not require changes in the central bank’s objectives and mandate; the difference lies merely in implementation. The question is not to ease or tighten the framework, but rather to allow for consideration of previously less significant and thus less monitored factors, in order to more efficiently achieve the unchanged objective.
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