

MNB BULLETIN
January 2013



MAGYAR NEMZETI BANK

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The aim of the Magyar Nemzeti Bank with this publication is to inform professionals and the wider public in an easy-to-understand form about basic processes taking place in the Hungarian economy and the effect of these developments on economic players and households. This publication is recommended to members of the business community, university lecturers and students, analysts and, last but not least, to the staff of other central banks and international institutions.

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Summary

DEAR READER,

The Magyar Nemzeti Bank attaches great importance to making central bank analyses on various current economic and financial trends of general interest available to the wider public. The January 2013 issue of the MNB Bulletin provides an overview of the major stages of the euro-area crisis, takes an account of the effects of intraday credit transfers, examines the case of the LIBOR review, reports on the central bank dilemmas related to the VAT increase, investigates the causes of low investment rates in Hungary and summarises the issues raised in relation to the limitation of cash payments. In addition, the current issue features an interview with Harald Uhlig, Professor at the University of Chicago.

The article by Ágnes Csermely provides an overview of the road of the euro area from the recession through the crisis to the reorganisation of the institutional structure. The debt crisis has brought to the surface key weaknesses in the institutional structure of the EU. The public securities markets of the individual countries have turned out to be potentially just as vulnerable to speculative attacks as fixed exchange rates. It has emerged as an unmanageable problem that, while governments themselves are struggling with the sustainability of debt, banks operating on the integrated money and capital markets are also relying on the national governments for a bailout. The difficulties of potential recovery are aggravated by the fact that the strict fiscal policy serving as the institutional foundation of the euro area needs to be restored at a time when the private economy is also in the process of deleveraging, while monetary policy is unable to boost growth through further interest rate cuts. Calming down the escalating crisis would have required rapid crisis management measures. However, the measures adopted as a result of compromises between economic rationality and political reality proved inefficient for a long time. The institutional vacuum gave rise to the emergence of self-generated negative spirals. It has now become obvious that the institutional framework of the monetary union needs to be reconsidered, including increased risk sharing between member states, and that an increasing number of fiscal and control functions need to be elevated to the Community level. The emerging institutional structure, which still lacks full political support, is seen as a longer-term strategic goal.

Éva Divéki and István Helmeczi review the effects of intraday credit transfers in operation since July 2012. In the past half year, the new system operated reliably, without any trouble. The central clearing of transactions is typically performed within 10 minutes, and almost all transactions are executed within 2 hours, i.e. the transferred amount is credited to the beneficiary's account within this time span. Experiences of the first half year suggest that the management of the liquidity needed for the settlement of intraday credit transfers also does not cause any problems for banks. According to the authors' calculations, in line with their preliminary expectations, banks implemented only negligible hikes in their fees in connection with the introduction of the intraday credit transfer. The new system also offers advantages that will have favourable effects over the medium and long terms as well. These favourable effects include an expected increase in competition among banks and the hoped wide spreading of automation from customer to customer.

In their article, Szilárd Erhart, Imre Ligeti and Zoltán Molnár analyse the reasons for and effects of the LIBOR review. In 2012, news related the manipulation of LIBOR directed the attention of authorities and the general public to interbank reference rates. International reviews made it clear that a reform of LIBOR and the numerous reference rates that follow the methodology of LIBOR is necessary, because changes in reference rates influence the payment terms of thousands of billions in loans and other financial agreements. Rapid and at the same time radical changes cannot be expected in the short run, because preparation of the changes poses a regulatory challenge that requires complex, international cooperation. In order to restore confidence, as of 2013 the British authorities intend to strengthen LIBOR by the introduction of a statutory regulation, and they are also planning to designate a new, independent administrator and to drastically cut the number of quotes. Overall, the article confirms the findings of earlier analyses prepared by the Magyar Nemzeti Bank, according to which BUBOR shows the real market conditions as an average of longer periods, but at present its ability to provide a short-term forecast of interest rate steps is limited.

The article by Dániel Felcser seeks to answer the question of how the central bank should react to the VAT increase. With a VAT increase, prices go up in the economy as businesses pass through the effects of the tax rise. Technically, this means that the consumer price index increases for one year; this is called the first-round effect. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the VAT hike to be persistent and future inflation to remain higher than it was before the VAT rise in the long term. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. According to the international best practice of central banks, monetary policy disregards the one-off price level increasing shocks, but attempts to offset second-round effects on inflation. However, in countries where the inflation target had not been met before the VAT rise, central banks are more inclined to also react to direct price level increasing measures, and risks relating to the anchoring of expectations are highly articulated in the communication of the central bank. As inflation in Hungary has persistently been above the target, there is a possibility that the recurring cost shocks may become incorporated into inflation expectations and may cause stronger second-round effects.

Ádám Martonosi examines the causes and effects of low domestic investment activity. Since the onset of the economic crisis, an unprecedented downturn in investment in the national economy has occurred in the past four years. This marked decline has been registered in all sectors of the economy, albeit to differing degrees. Investment is a key aspect of convergence for the Hungarian economy as the renewal and expansion of the capital stock determines the magnitude of production capacities, and through that, economic output. The lack of investment by the government sector and households mainly reduces gross domestic product in the short term, while the decline in corporate investment not only directly reduces aggregate demand, it also has a negative impact on Hungary's potential growth in the medium and long term. In a regional comparison, investment trends in Hungary were already moving in the wrong direction before the crisis, with the investment ratio gradually declining as a percentage of GDP. The adjustment of 2006 considerably reduced government expenditures, and simultaneously the less favourable demand conditions resulted in a general drop in corporate investment. As a result of the above, at the onset of the crisis Hungary had the lowest investment rate in the region. The combination of the major economic slowdown, the substantial balance sheet adjustment requirement for the public and private

sectors alike and the marked downturn in the lending activity of banks caused a substantial decline in investment. In Hungary, the decrease in accumulation by households has been significant in international comparison, while the government's investment ratio has remained stable in recent years, mostly as a result of the accelerated use of EU funds. The drop in corporate investment proved to be substantial primarily in sectors producing for the domestic market and in the service sectors, while investment by companies producing for exports was boosted considerably by large projects in the manufacturing industry. Domestic economic activity was largely consistent with trends in the region, but the combination of an unfavourable initial position, the negative outlook for the individual sectors as well as the existing risks point to persistent investment problems. Looking forward, the lack of investment may reduce the speed of Hungary's convergence to Europe and the country may fall behind its neighbours in terms of economic growth.

In their article, Judit Brosch and Zita Véber report on the limitations of cash payment. In connection with the interpretation of the legal tender status of banknotes and coins, different views have been voiced in recent years: whether cash or certain denominations of banknotes and coins (large-denomination banknotes, small-denomination coins) can be rejected as means of payment for products or services; whether it is acceptable that a product or service can be paid only through electronic payment instruments, and whether cash surcharges can be applied. In the opinion of the Magyar Nemzeti Bank as the body responsible for the issuance of forint banknotes and coins, the legal tender status of banknotes and coins does not mean their obligatory acceptance for payment under all circumstances. The article provides an overview of the various approaches to the legal tender status and presents the technical arguments which the authors believe support the position of the MNB.

Finally, the Bulletin contains an interview with Harald Uhlig, Professor at the University of Chicago. Before joining the University of Chicago, Professor Uhlig taught at Princeton University, Tilburg University and at Humboldt University, Berlin. His research areas include macroeconomics, financial markets and Bayesian econometrics, with special regard to their intersection. Between 2006 and 2010, he was Co-Editor of *Econometrica*. He contributes as Advisor to the work of the Deutsche Bundesbank and the Federal Reserve Bank of Chicago. Currently, he is Leader of the Business Cycle Dating Committee established by CEPR and Research Fellow of CEPR and NBER. Professor Uhlig was awarded the Grand Prize of the 'Verein für Socialpolitik' in 2003.

The Editorial Board

Ágnes Csermely: Who pays the ferryman? The story of the euro area from recession to political crisis to the revision of the institutional structure¹

The debt crisis has brought to the surface key weaknesses in the institutional structure of the EU. The public securities markets of the individual countries have turned out to be potentially just as vulnerable to speculative attacks as fixed exchange rates. It has emerged as an unmanageable problem that, while governments themselves are struggling with the sustainability of debt, banks operating on the integrated money and capital markets are also relying on the national governments for a bailout. The difficulties of potential recovery are aggravated by the fact that the strict fiscal policy serving as the institutional foundation of the euro area needs to be restored at a time when the private economy is also in the process of deleveraging, while monetary policy is unable to boost growth through further interest rate cuts. Calming down the escalating crisis would have required rapid crisis management measures. However, the measures adopted as a result of compromises between economic rationality and political reality proved inefficient for a long time. The institutional vacuum gave rise to the emergence of self-generated negative spirals. It has now become obvious that the institutional framework of the monetary union needs to be reconsidered, including increased risk sharing between member states, and that an increasing number of fiscal and control functions need to be elevated to the Community level. The emerging institutional structure, which still lacks full political support, is seen as a longer-term strategic goal.

THE BASIC CONCEPT OF THE EURO AREA: MONETARY UNION WITHOUT A FISCAL UNION

Before the introduction of the single currency, the countries of the euro area operated an exchange rate regime that was pegged to the German mark (ERM, ERM-II). That period was characterised by frequent currency crises and, consequently, several participating currencies were repeatedly devalued due to market forces. With the liberalisation of the movement of capital, such speculative attacks became increasingly common and more expensive. As the increasing vulnerability of fixed exchange rate systems became apparent in other parts of the world as well, economic thinking began to reconsider the costs and the benefits of strictly managed exchange rates. By the early 1990s, "corner solutions", i.e. the irreversible fixing of the exchange rate and free floating, had become the exchange rate systems preferred by the economic profession.

In keeping with the ever-closer economic integration, member states of the European Union decided in favour of

adopting a single currency. The fact that, during the previous decades, the Bundesbank had been the only central bank to pursue an independent monetary policy, was certainly conducive to making that decision. At the same time, there was no political support for centralisation or even harmonisation of fiscal policies. Therefore, it was intended that the stability of the institutional structure would be guaranteed by the budgetary discipline of the individual countries. That idea fell in with the economic thinking of the early 1990s as, at that time, the credibility of the fixed exchange rate was mostly undermined by the lack of budgetary discipline.

Accordingly, the Maastricht Treaty included a number of institutional guarantees in order to ensure fiscal discipline by the member states. First, a law was adopted banning member states or the ECB from providing a "bail out", i.e. monetary financing, to another member state. The fiscal policy of member states was monitored through the joint discussion of convergence and stability programmes whereas an excessive deficit procedure was initiated against countries that did not comply with fiscal discipline.

¹ Based on the presentation delivered at the 20th Convention of the Hungarian Economic Association in Eger, on 28 September 2012.

MOST PERIPHERAL COUNTRIES GOT INTO TROUBLE FOR REASONS OTHER THAN A LACK OF FISCAL DISCIPLINE

While cracks in the architecture of the euro area had already appeared before the crisis, including half of the member states being subjected to the EDP at times, fiscal discipline continued to exert its influence. With the exception of Greece, the troubled countries managed to meet the fiscal criteria. At the beginning of the crisis, Spain and Ireland had the lowest public debts. While Italy and Portugal had higher levels of debt, their budget deficits had been reduced to acceptable levels and thus were not being subjected to an excessive deficit procedure when the crisis erupted.

In smaller countries, the rapidly increasing debt of the private sector represented the fundamental problem. Following their accession to the euro area, significant amounts of capital began to move into these countries. The resulting low interest rates, coupled with the "europhoric" income expectations linked to their accession to the euro area, encouraged the rapid increase of the indebtedness of the private sector. Both a credit bubble and a real estate bubble was generated, increasing the vulnerability of the banking system. The rapid growth of foreign indebtedness did not trigger a policy response as, according to the prevailing opinion, debts between countries within the monetary union did not matter.

In fact, private sector overheating caused fiscal indicators to appear in a better light, as revenues from a growing rate of employment, property taxes and extra profits continued to improve the budgetary position for years. Therefore, authorities in both Brussels and the member states were unprepared for the speed at which these revenues disappeared following the outset of the crisis and the extent of the subsequent deterioration in the governments' financial positions. The loss of temporary revenues generated by the overheated economy and deep recession resulted in a rapid increase in public debts. The unmanageability of the situation was, however, greatly aggravated by the escalation of the problems emerging in the banking sector. On the one hand, this generated a direct fiscal cost, while indirectly (due to the steadily declining economic output as a result of the credit crunch), it also marred the perception of the sustainability of public debt.

THE INSTITUTIONAL PROBLEMS OF THE EURO AREA CONTRIBUTED TO THE DEEPENING OF THE CRISIS

Numerous earlier debt crises² documented in economic history typically resulted in a more serious and longer-lasting economic slump compared to exchange rate crises. The extent of the current debt crisis is outstanding even by these standards, as many developed countries are simultaneously affected globally, and consequently these countries which are forced to cut their domestic demand are unable to recover from the recession by increasing their exports.

The protracted nature of the debt crisis has partly been due to the fact that, at such times, the efficiency of traditional economic policy instruments is extremely low, as decision-makers tend to focus more on downsizing debt rather than on maximising profits. Due to the vicious circles emerging in the debt crisis, the recovery of economic growth becomes extremely difficult. The interactions between the financial sector and actors of the real economy contribute to the emergence of a downward spiral. The behaviour of the private sector tends to be mostly affected by the increasingly unfavourable income expectations, growing interest costs and a loss in the value of real estate and holdings of securities, resulting in a substantial decline of the propensity to consume, along with a reduction in employment and the deferral of investments. The activity of the banking system is impacted by the deteriorating quality of portfolios, the loss of the value of collateral, the increasing cost of borrowing and the tightening of external financing conditions, which results in a reduction in the general availability of loans. Through the so-called financial accelerator effect, all of these also have repercussions for the balance sheets of non-banking actors. The lending shortage has a restraining effect on production, contributing to the slump in the economy, the deterioration in the perception of risk, the decline of asset prices and the rise of interest expenses. All of this makes the outlook of economic agents even gloomier, which in turn increases the adaptation pressure.

In the countries caught up in the vicious circle of the debt crisis, both governments and central banks play a key role in stabilising the situation. However, deploying the traditional instruments of stabilisation is not the most important step to facilitate recovery from the crisis.

² IMF (2009), *World Economic Outlook*, April, Chapter 2.

Monetary policy

The monetary policy of countries in a debt crisis responds to the substantial decline of growth and the increase of deflation risks by reducing interest rates. This, however, has a small impact on household credit demand and thus on consumption, as the primary goal is to reduce debt. Similarly, low interest rates will not provide a strong enough incentive for investors, due to the uncertainties in the market. As the impact is low, central banks tend to use their maximum latitude in order to improve monetary conditions. In this type of crisis, however, the most important task of central banks is to remove the obstacles to the functioning of the financial system. To that end, they help resolve the scarcity of bank financing through new instruments to improve liquidity and attempt to restore operation of the frozen segments of capital markets as soon as possible, resorting to a wide array of unconventional measures.

During the initial period following the onset of the crisis, the monetary policy pursued by the ECB was similar to that of the central banks of other developed countries. It reduced key interest rates, in several steps, to virtually zero, created new liquidity-generating opportunities for banks and launched an asset purchase programme in order to restore the functioning of frozen money markets. However, as the crisis spread to European sovereigns, the limitations of the institutional arrangement emerged. While during the period prior to the crisis, the public securities issued by member states of varying degree of indebtedness had, from an investor point of view, been very close substitutes of each other, from 2009, these sub-markets which play a key role in the transmission of monetary policy started to become increasingly segmented. Similarly, it could be assumed that risk avoidance due to doubts concerning the future of the euro area as well as speculation were playing a part in the shaping of the extreme pricing. Despite the key importance of public securities markets in the preservation of the functionality of the financial system, the ECB, bound by the ban on monetary financing, was unable to play an active role in the stabilisation of these markets.

Fiscal policy's scope for action

Fiscal policy also plays an important part in the stabilisation of the debt crisis. The most helpful forms of fiscal loosening are ones intended to directly generate demand in the economy (e.g. vehicle scrapping schemes, employment programmes or investment in infrastructure). Another

government task of primary importance is the speedy restoration of the lending ability of the banking system, since lending is needed to enable the allocation of resources and growth to resume. In earlier debt crises which were successfully managed, the priorities of economic policy have always included the cleaning of the balance sheets of the banking system (e.g. Sweden 1992–1993, USA 2007–2009). On the other hand, it took a long time to restore growth in countries where economic policy turned a blind eye to the bad loans that had accumulated on banks' balance sheets (e.g. Japan's "lost decade" following the crisis of 1992).

Similarly to monetary policy, fiscal stabilisation in Europe can be divided into two periods. In the first phase of the crisis, when the centre of the crisis was still in the US, the European Union announced the launch of a coordinated fiscal stimulus package. The European Economic Recovery Plan allowed a quick yet temporary fiscal relief in each country considered to be free of concerns about fiscal sustainability. This internationally coordinated programme was successful. In 2009, it was expected that growth would resume in both the US and Europe. However, as the first results of stabilisation became apparent, the fiscal policies of the US and Europe started to follow different paths. While fiscal incentives continued in the US, the EU opted for the gradual elimination of excessive deficits. In 2011 and 2012 budgets were severely tightened in most countries. This could partly be due to the fact that the Greek debt crisis had openly questioned the institutional foundations of the euro area and increasing speculation was surfacing in connection with a possible disintegration of the euro area. Therefore, various European economic policy-makers came to the conclusion that, in the current situation, the most important task was to restore the most important institutional foundation of the euro area, i.e. the fiscal discipline of the member states as soon as possible. Rapid fiscal consolidation also appeared to be the appropriate remedy against the contagious effects of the debt crisis.

The change in direction in European fiscal policy gave rise to a serious debate both within the euro area and on international fora. Core European countries with a favourable risk rating were criticised³ for having reversed fiscal policy too fast, removing the only support for growth and thus helping Europe slump back into recession. Since growth in peripheral countries can only be based on exports, the countries which previously provided the lending for the run-up of excessive debts should now increase their internal demand in order to encourage the economic adaptation of the peripheral countries.

³ IMF (2012), *World Economic Outlook*, April, Chapter 2.

An even more serious controversy took shape in connection with the fiscal policy to be pursued by the member states in trouble. While the European mainstream considered that a multi-annual programme of reforms and dynamic fiscal consolidation would be necessary, the delayed start of economic growth raised increasing doubts concerning the appropriateness of quick fiscal consolidation. The chief argument of the advocates of increasing fiscal latitude⁴ was that these countries were in a special situation where the fiscal multiplier was substantially higher than usual⁵ and therefore austerity would set back growth to such an extent that the targeted budget deficit could not be achieved due to the melting of tax bases and the extra expenditure as a result of the decline in employment. In an extreme situation, austerity can become self-destructive, i.e. regardless of the measures taken, the decline in growth and its adverse effect on market returns will result in the perception of fiscal sustainability not improving at all.

A slower rate of fiscal consolidation is only viable if someone is willing to finance it at an acceptable rate of interest. Advocates of rapid fiscal consolidation argue that the key to resolving the situation is the speedy restoration of trust on the market, which can only be achieved by attaining a sustainable budgetary position as early as possible. As long as that is not achieved, high interest premiums and the continuing decline of asset prices will only aggravate the balance sheet position of the private sector. According to this school of thought, a slowdown in consolidation leads to long-term recession.

The intertwined fates of states and banks

Finally, as far as the management of the problems of the banking system is concerned, the approach taken by European countries was again different from that of the US. In the United States, a substantial cleaning of portfolios and the recapitalisation of major banks by the federal government started in 2009. While a similar wave of recapitalisation took place in Europe in 2009, the systemic audit of the portfolios is still to be carried out. Moreover, the European authorities left much greater scope for banks to improve their capital position through balance sheet adjustment, i.e. downsizing their assets.

The slow consolidation of the banking system may be due to several factors. First, while banking activities have spread across national borders, there was no unified surveillance of

their activities or a European institution with an overall view of their relations and the potential contamination channels. Concerns about potential rippling effects also delayed the write-off of losses. Second, since the cleaning of bank portfolios is typically carried out with substantial state commitments, governments in a weakened budgetary position were reluctant to take on added burdens. The example of Ireland in particular, where the nationalisation of failed banks was followed by an extremely fast increase of public debt, put governments on guard.

The situation, however, continued to deteriorate due to the postponement of bank consolidation. If the quality of a bank's portfolio deteriorated, investors immediately responded by downgrading the risk rating of the country where the bank's headquarters were based since, if the bank goes bankrupt, the state will ultimately have to cover the depositors' money. Since the balance sheet totals of numerous banks were very high compared to the size of national budgets, investors also downgraded their perception of fiscal sustainability. That also had repercussions on the perception of banks as they had a large amount of public securities in their possession. A vicious circle was thus generated, resulting in an ever-worsening investor perception of banks and governments. The resulting uncertainty slowed down the performance of the economy by curbing lending by banks and the ensuing extremely high costs of financing. The recession in turn added to the problems of both the banking system and public finance.

The state has no lender of last resort

Finally, as an additional aspect of institutional problems, mention must be made of the absence of the lender of last resort function to the state. The crisis has revealed that, if liquidity problems occur, member state governments are unable to obtain funds as central banks are prohibited from providing monetary financing to governments. That leaves the states concerned in a situation similar to having a debt denominated in a foreign currency. Paul de Grauwe⁶ illustrates the problem through a comparison of the economies of Spain and the UK. Despite the similar fundamentals of the two countries, there is a significant difference in yields on the public securities market. This may be related with the market perception whereby if a government had liquidity problems, the Bank of England would be both able and willing to provide temporary

⁴ GROS, D. AND R. MAURER (2012), "Can Austerity Be Defeating?", *Intereconomics*, 3.

⁵ Under normal circumstances, monetary policy is capable of compensating the impact of fiscal austerity, while economic operators aim to smooth their consumption; such compensatory mechanisms do not work in the current situation.

⁶ DE GRAUWE, PAUL (2011), "Managing a fragile Eurozone", *Vox.Eu blog*.

financing assistance, whereas the same is considered unlikely as far as the ECB is concerned.⁷ Should such a difference in behaviour really exist, it may increase the risk of sovereign default in euro area countries under a worst-case scenario. Therefore, apart from a crisis-driven market behaviour that has tended to test potential economic policy responses to extreme scenarios, the questions about the lender of last resort function may have been an additional factor feeding speculation on the public securities markets of peripheral countries. The exposure of the public securities markets of member countries to speculative attacks is certainly considered a serious systemic risk. Temporary liquidity problem could escalate into a solvency crisis as sustainability indicators decline, due to the prevailing interest rates and poor economic performance.

ECONOMIC POLICY RESPONSES

The euro area was caught unprepared for the spread of the European sovereign debt crisis. Since the monetary union, based on fiscal self-control, lacked institutions for crisis management, the necessary measures could not be adopted before the conclusion of a negotiation procedure between the member states. By nature, this decision-making mechanism is significantly slower than that of the United States, for example, where the federal government and the Fed were fully empowered to adopt decisions on emergency measures, including immediate liquidity injections financed by the central budget. The delay in the adoption of crisis management measures, public discussion on contrary opinions and interests and the uncertainty surrounding the ultimate decision contributed substantially to the escalation and the spread of the crisis to several countries within the region.

The institutional reforms carried out during the crisis fall into two categories. The first group includes measures designed to prevent the emergence of potential crisis situations in the future, while the second group includes the institutions of crisis management. Since the measures in the second category also involve direct financial transfers and commitments to future liabilities, progress in that field has been slower. A future risk-sharing framework is still work in progress.

Preventive measures

To prevent the emergence of potential crises in the future, the institutions to enforce fiscal discipline have been reinforced in various phases and through several legislative packages (six-pack, two-pack and the Fiscal Compact). The

extent of the adjustment expected of the member states in order to eliminate the excessive deficit and excessive debt procedure has thus been more accurately defined. Failure to adjust leads to financial sanctions. Moreover, the changing of the rules of procedure has made it substantially more difficult for member countries to sabotage the enforcement of the rules of fiscal discipline through political compromises.

Since the lack of budgetary discipline was not the sole or the primary factor contributing to the emergence of the current crisis, a new institution, the excessive imbalance procedure was developed to monitor the emergence of macroeconomic imbalances and to coordinate economic policy responses. It allows the Commission to continuously monitor the balance and indebtedness indicators of the member states and, if it concludes that financial imbalances are accumulating, it will put forth suggestions for the required financial adjustment. The European Semester establishes the institutional framework that enables the Commission to express, at an early stage of the budgetary process, its opinion on the structural and stabilisation measures, and economic policymaking. Finally, new European bodies have also been set up with a view to monitoring the lending trends that play a crucial role in the emergence of financial imbalances. The tasks of the European Banking Authority (EBA) include the coordination of surveillance activities, the assessment of the processes of the banking system from a microprudential point of view and the formulation of recommendations, while the European Systemic Risk Board (ESRB) was given the task of carrying out macroprudential analyses. At the outset of the crisis, however, these institutions did not exist and even if they had existed, they would not necessarily have had an opportunity to exert a significant influence on the situation as these new bodies hardly have any actual power to adopt decisions. The opportunity to intervene in and the responsibility of managing the problems of the banking system have been left at the national level.

Crisis management measures to control the debt crisis

The debt crisis can be brought under control if, as a result of the appearance of a lender of last resort of sufficiently high fire-power, market participants attribute very low probability to the occurrence of sovereign default, which would result in the inability of the state to finance its maturing government bonds. At the outbreak of the crisis, however, the function of the lender of last resort to the state had not been institutionalised within the euro area.

⁷ In both countries, monetary financing is banned by the Maastricht Treaty.

Moreover, the no bail-out clause and the prohibition of monetary financing also prevented the emergence of a possible solution. The most severe obstacles, however, were of a political nature. Since, at the time of the establishment of the European Union, such an eventuality was not included among the rules of the game, taxpayers within the EU are very unwilling to grant financial support to other countries. While political support for smaller transfers was obtained, it became increasingly difficult with the escalation of the crisis, as the possible grand total became increasingly difficult to assess.

The establishment of the European System of Financial Supervision (EFSF) was the first in a series of emergency measures. Under the EFSF, rather than EU member states providing direct lending, they contributed to the establishment of a crisis management fund to provide financial assistance to member states facing liquidity problems subject to strict macroeconomic conditions. Later on, in an attempt to set up a permanent institution, member states decided to establish the European Stability Mechanism (ESM), which is capable of involving money market funds to finance consolidation programmes under the guarantees granted by the member states. In 2010, the ECB also announced its Securities Market Programme (SMP), under which it purchased government bonds at the value of €217 billion. The interventions by the ECB were designed to restore the proper transmission of monetary policy, i.e. to enable low interest rates on the public securities markets of troubled member states. Since, however, the volume of the intervention was not significant, it was unable to achieve a substantial reduction of risk premia. Later on, at the turn of 2011 and 2012, the ECB also employed indirect means to help restore the public securities markets of peripheral countries. Under the LTRO (Long Term Refinancing Operation) programme, it made available multi-annual credit lines to banks. These were primarily used by commercial banks in troubled countries partly for purchasing public securities issued by their respective countries.

Despite the measures adopted in order to manage the crisis, these interventions lacked sufficient fire-power to prevent the spread of the crisis. On the contrary, the escalation of the crisis was accompanied by market hysteria concerning the potential sufficiency of the available funds. These solutions also failed to address the problem arising from the joint assessment of the position of banks and governments. In fact, it is possible that the LTRO, despite providing effective relief to the liquidity crisis in the banking sector, made the problem of related risks even worse. A number of suggestions have been put forward on the possible means to increase the magnitude of Community-

level interventions on the public security markets in addition to the commitments of the member states through contributing to the EFSF and the initial capital of the ESM. None of these suggestions have, however, been given the required political support as both the simple and the complex schemes were implicitly based on the sharing of costs on a Community level. The fact that it was apparent which countries would be the payers and the beneficiaries in the short term was not the only obstacle that prevented the broad political support of these schemes. Another factor playing an important role in the protracted negotiations has been that such a risk-sharing mechanism goes far beyond the framework of cooperation envisaged by the Maastricht Treaty.

A breakthrough in the suppression of market speculations concerning the appearance of a lender of last resort was achieved in summer 2012. On the one hand, the legal concerns about the operation of the ESM were resolved and even the contributions by the member states were increased. Yet, even more importantly, the ECB announced its OMT (Outright Monetary Transaction) programme. Under the latter, the ECB is willing to purchase an unlimited amount of public securities issued by countries under an ESM programme, provided that these countries meet the criteria set by the programme. While only verbal intervention has occurred so far, the possibility of unlimited intervention resulted in a significant decline in returns on the public securities markets of the countries concerned, despite the fact that participation in the programme has been subject to stricter conditions than was first thought by the markets. Unfortunately, this has not brought an end to the debt crisis. It remains to be seen whether the countries in need of financial assistance will be able (and willing) to push through the required strict fiscal consolidation programmes under the deteriorating economic conditions and increasing social tensions or whether they will arrive at a point where leaving the monetary union has smaller costs.

Separating the risks of banks and governments

A crucial aspect in the escalation of the crisis was that the risks of banks and sovereigns have been linked and have mutually reinforced each other, due to banks operating on a multinational basis, whilst the bank bail-out functions have been delegated to the level of the member states. Prior to the crisis, no institutional solution had been established for bank surveillance beyond the member state level or for the sharing, between the countries concerned, of the costs of the management of the banking crisis. If, as a consequence of the crisis, the banking system to be established in the future requires an accord between the activities of banks and the magnitude of crisis management

capacities, there are two possible alternatives for the development of the euro area. Either banks must return to the confines of the individual member states or, if the benefits of the increased efficiency of a single monetary market are to be preserved, the institutions of Community-level bank bail-out instruments and Community-level deposit insurance must be established. As a condition precedent for the increased sharing of the inherent risks of the banking system, however, both prevention and bank surveillance must also be raised to the Community level in order to eliminate the problem of free riders. That new institutional setup has been outlined by the proposal for a banking union.

The banking union would be based on four pillars. The first pillar is the common regulatory framework, i.e. the "single rulebook" of prudential rules. Supervision and prevention would be transferred to a central surveillance body headed by the ECB. While essentially functioning as a microprudential authority, according to the current ideas it would also have macroprudential powers. On the longer run, the safe operation of a collectively supervised banking system could potentially be supported by a joint bail-out fund, which would be established mainly with contributions of the banking sector, but which would, ultimately, have access to the financial instruments of the ESM. On the other hand, potential sharing of the current costs of the consolidation of banks has no political support. Finally, there have been negotiations on the potential establishment of a deposit insurance fund, to be financed by the contributions of banks. Such an institution, however, would also be unable to exert effective influence on the behaviour of the depositors, unless it is backed by Community-level funding. For the time

being, greater progress has been achieved as far as the establishment of common surveillance is concerned, while no political consensus has yet been outlined in terms of the framework of the common sharing of risks.

Quo vadis, Eurozone?

The crisis has demonstrated that the concept of a "monetary union without a fiscal union" which serves as the institutional basis of the euro area is ineffective in dealing with situations that endanger financial stability and, therefore, a crisis management framework at the level of the monetary union is required. As a condition precedent for sharing financial stability risks, however, joint institutions must also be established to prevent the accumulation of risk. This situation requires various aspects of the treaty between the member states to be reconsidered. Various functions currently within the competence of the individual member states should be centralised and a substantial risk-sharing should be established between the European countries. That would represent a different quality of the framework of cooperation, which can only be achieved through a reinforced political mandate rather than a series of minor technical steps of institutional reform. Since the summer of 2012, various European leaders have disclosed their ideas concerning the future of the euro area, all of which were based on the establishment of a restricted fiscal federation legitimated by a political union. While due to political reasons these ideas are very unlikely to be achieved in the short term, the vision of the future of the euro area may play an important role by encouraging the union to choose solutions pointing toward a deepening integration during the management of the crisis.

Éva Divéki and István Helmeczi: The effects of the introduction of the intraday credit transfer

In Hungary, the overwhelming majority of credit transfers have been executed in the course of the day since July 2012. In the past half year, the new system operated reliably, without any trouble. The central clearing of transactions is typically performed within 10 minutes, and almost all transactions are executed within 2 hours, i.e. the transferred amount is credited to the beneficiary's account within this time span. Experiences of the first half year suggest that the management of the liquidity needed for the settlement of intraday credit transfers also does not cause any problems for banks. According to our calculations, in line with our preliminary expectations, banks implemented only negligible hikes in their fees in connection with the introduction of the intraday credit transfer.

The new system also offers advantages that will have favourable effects over the medium and long terms as well. These favourable effects include an expected increase in competition among banks and the hoped wide spreading of automation from customer to customer.

INTRODUCTION

In Hungary, the regulation of payment systems is included in the scope of duties of the Magyar Nemzeti Bank (MNB). Accordingly, for the public good, the MNB performs continuous monitoring of the quality of the services that can be used by real economy customers and the development of technology. Development proposals are elaborated with focus on customers' interests, but taking account of technological reality.

In June 2010, the MNB decided to amend MNB Decree No. 18/2009 (VIII. 6.) on the Execution of Payment Transactions (hereinafter: the Decree). Following consultations with the stakeholders, the amendment was published in October 2010, with entry into force on 1 July 2012, in line with the planned launch of the intraday credit transfer system. The objective of the amendment of the Decree was to ensure with legal means that customers in Hungary receive up-to-date payment service at reasonable price. Pursuant to the provision of the Decree (the so-called 4-hour rule), credit institutions (hereinafter: banks) must forward the sum of the forint electronic credit transfer orders by customers to the beneficiary's account-holding bank within 4 hours from debiting the customer's account. It has been an effective rule for years that the beneficiary's bank must credit the sum of the payment orders received to their customers' account immediately.

Our article presents the experiences of the first half year of operation of the intraday credit transfer system, with special regard to the changes in bank charges attributable to the introduction of the new system.

THE INTRADAY CREDIT TRANSFER PROJECT

Domestic payments were previously served by two clearing systems:

- The so-called VIBER (Real-time Gross Settlement System) operated by the MNB (since 1999): payments in this system may be settled in a few minutes, and its primary function is the risk-free settlement of very high-value interbank money market transactions.
- The night platform of the ICS (Interbank Clearing System) operated by GIRO Zrt. (since 1994); this system was designed to clear the payment transactions of the real economy (households and corporates), and it ensures that the beneficiary receives the transferred amount on the next day.

Although VIBER also allows the settlement of real economy transactions, in practice the number of such items moving therein is relatively low. This is primarily attributable to the high bank charges (often starting from HUF 10,000), due to

which the use of this system is extremely uneconomical for customers (except for the cases when a high bank fee is still better than the effect of the consequences of a default in payment). Banks send the items into the night platform of the ICS in bulk, in the afternoon and evening. The items are already received by the receiving banks in the early hours of the next morning, and are typically credited to customers' bank accounts by the time when branches open in the morning. In 1994, this service level was considered state-of-the-art, but the MNB thought that compared to today's technology it did not provide an acceptable service level any longer. Therefore, it examined whether intraday clearing of real economy transactions entails any financial risks that would still justify the maintenance of the older clearing infrastructure. The analysis concluded that banks' liquidity is completely sufficient for the settlement of the result of intraday clearing of real economy items.¹

In addition, in the past decade, credit transfers settled on the same day have become a basic service in most Eastern and Western European countries as well, which also pointed to the necessity of raising the domestic service level. This has an impact on interbank competition as well, because previously banks with a larger clientele were able to obtain customers more easily, as there was a fair chance that a customer's partners also had their accounts at the given bank (allowing cheaper, faster settlement of transfers to them).

With introduction of the 4-hour rule, the MNB intended to achieve that banks jointly create a flexibly parameterable clearing system, in which a given amount can turn round several times in a day ('A' pays to 'B', who pays from this amount to 'C'), and that this be the minimum service in Hungary (i.e. banks should not provide it as a premium service with a pricing similar to that of VIBER for their customers). The 4-hour rule ensures that most of the payment orders contribute to the return on the development, and thus the bank costs of the investment are distributed across a large number of transactions, so that the increase in production cost per transaction can also be kept at a low level.

Analysing domestic customers' activity – based on the March 2007 per minute data – we can see that customers mainly give credit transfer orders to their banks during the daytime, primarily during working hours. The clearing cycle periods have been determined accordingly (see Table 1). In addition to amending the Decree, the MNB used other

means as well to facilitate implementation of intraday credit transfers. In addition to initiating a nationwide project to coordinate the preparations of the banking sector, it also extended the operating hours of its own real-time system so that the clearing and settlement systems can be open in the periods when customers' activity is the highest.

The 4 hours set forth in the Decree is the MNB's minimum requirement, which can be met with bi-hourly clearing even if one of the banks has a minor operating problem during the day or at the time of the clearing cycle just does not have sufficient funds on its account held with the MNB.

In 2008, the MNB requested the banks that account for the most part of the turnover to estimate the expected costs of the project on the basis of the preliminary concept of the intraday credit transfer system. Banks' estimates varied very widely: as great as tenfold differences occurred between the estimates of banks with similar sizes and turnovers. However, as retail payment transactions represent a very high number of credit transfers, the investment cost can be distributed across a huge amount of transactions. Accordingly, based on the MNB's calculation – writing the banking sector's investment off as depreciation in 5 years (distributed over a transaction turnover of five years) – the increase in banks' production cost per transaction was estimated to amount to HUF 3.40.

CHANGES IN INCOMES FROM PAYMENT SERVICES AND THE USUAL MAGNITUDE OF BANK FEES AND CHARGES

The most uncertain issue for the MNB in connection with the introduction of the intraday credit transfer was how banks would actually determine the fees and charges of credit transfers (hereinafter jointly: fees). However, before specifically discussing this question, it is worth examining the sources of banks' incomes from payment services and the types of fees applied by them in the pricing of credit transfers.

Incomes related to payment services may originate from:²

- the fees of payment services,
- the interest income from the balances in the accounts, and
- the float.³

¹ At the same time, it means that the justification for the high price of VIBER items also cannot be accepted in each case.

² Divéki and Olasz (2012).

³ Float is the interest income produced at banks on the credit transfers in transit and the settlement of which takes more than a day.

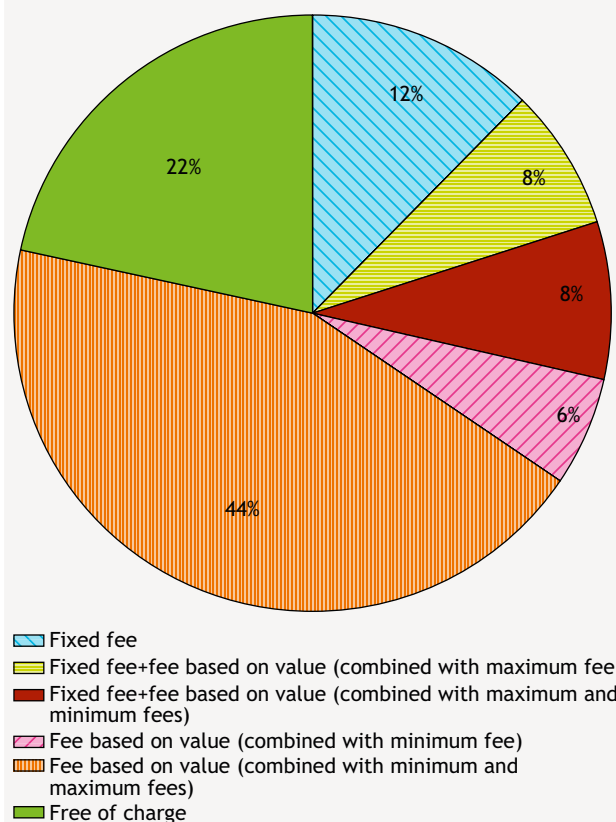
According to statistics available to the MNB, the value of banks' fee income from payment services amounted to an annual HUF 147–247 billion in the period between 2005 and 2011 (see Chart 2). This revenue is from the fees paid by customers to banks for using payment services. Examining the fees, it is worth analysing the fees of domestic forint credit transfers separately as well, since most of the transactions initiated by customers belong to this category.

Looking at the pricing of domestic forint credit transfers, a distinction must be made between the fees applied to the credit transfers of households and corporates. Considering that the pricing of credit transfers is combined and not the same in the case of various account packages, it is important to examine the types of fees of credit transfers. We mainly focus on the fee types applied in the case of electronically submitted credit transfers, because the 4-hour rule of the Decree also relates to electronically submitted credit transfers.

For households, banks apply fees based on value (per cent, per thousand), and they also apply minimum, maximum and fixed fees or free of charges; they may even be combined in various manners, depending on the given bank. A typical pricing method is the application of fees based on value, combined with minimum and maximum values. Fees based on value have been used by banks for credit transfers for years, so this type of fee is not unusual for customers. Looking at account packages for households,⁴ fees based on value (combined with minimum and maximum values) are applied in 44 per cent of electronic credit transfers. In the case of electronic credit transfers, the second most frequent is the free of charge type (22 per cent), followed by the fixed-fee category (12 per cent).

The main difference between the pricing of corporate and household credit transfers is that although there are announced and public conditions in the medium and large company segments, these customers (mainly the large corporates) are granted special prices by their banks, and it is difficult to obtain information about these prices. Therefore, fee types for the credit transfers of large corporations are not discussed in this article. In the case of small enterprises, in the pricing of credit transfers submitted via the electronic channel to outside the bank, banks typically apply fees based on value combined with minimum fee (78 per cent), followed by the joint application of the fixed fee and the fee based on value (10 per cent).

Chart 1
Fee types for electronic transfers in retail account packages



Note: Our charts examining fee types were prepared by taking banks' fee packages collected from the Internet as a basis in the period under review. For each fee package we checked which type of fee is typical of the electronic credit transfer in the given fee package; individual account packages were classified into categories corresponding to the type of fee accordingly.

Source: Payment service providers' conditions.

In addition to the fees income from payment services, income from payment services also include the interest income originating from the fact that the interest paid by payment service providers on the sight balance of bank accounts is typically lower than BUBOR, but by lending this same amount they can attain a higher yield. This type of income is estimated to have reached an annual amount of HUF 147–224 billion in the period between 2005 and 2011 (see Chart 2).

Until the introduction of the intraday credit transfer, the banking sector had another interest-type income as well from payment services, which is called float. Float meant the interest income from the money in transit. It originated

⁴ The account packages were analysed on the basis of lists of conditions collected from the Internet between April and October 2011. It was not possible to weight the individual types by the number of customers, because we did not have information on the number of customers that use the individual account packages at banks.

from the fact that banks debited their customers' accounts on the day of giving the payment order or on the date due, but the money remained with them, and they had to pass it on to the bank where the beneficiary had its bank account only at a later date – typically on the day when the other customer also received the money. Banks did not pay any interest to their customers for this period, but produced interest income for themselves. In Hungary, between two banks this period was typically 1 day, which increased to 3 days at weekends (or could even reach 4-5 days around holidays or upon a reorganisation of working days). Accordingly, float is the interest on current account for 1 working day not paid by the bank to its customer. The introduction of the intraday credit transfer practically terminated banks' float income.

In summary, (partly according to our estimates) payment service providers' incomes from fees, charges and interests related to payment services amounted to an annual HUF 301–428 billion in the period between 2005 and 2011. Of this, the value of fee incomes from payment services was HUF 147–247 billion, while interest incomes are estimated to have amounted to HUF 147–224 billion. Total income from payment services in the period under review amounted to 1.34–1.6 per cent of GDP at current prices. Incomes from payment services reached their highest level in 2011, amounting to nearly HUF 428 billion in total. Within incomes from payment services, in the period between 2005 and 2011, interest incomes of payment service providers represented a total share of 37–55 per cent, while the share of fee incomes was 45–63 per cent. Compared to them,

float income was low and estimated to be somewhat higher than HUF 3 billion in 2010 (however, Chart 2 does not include this income).

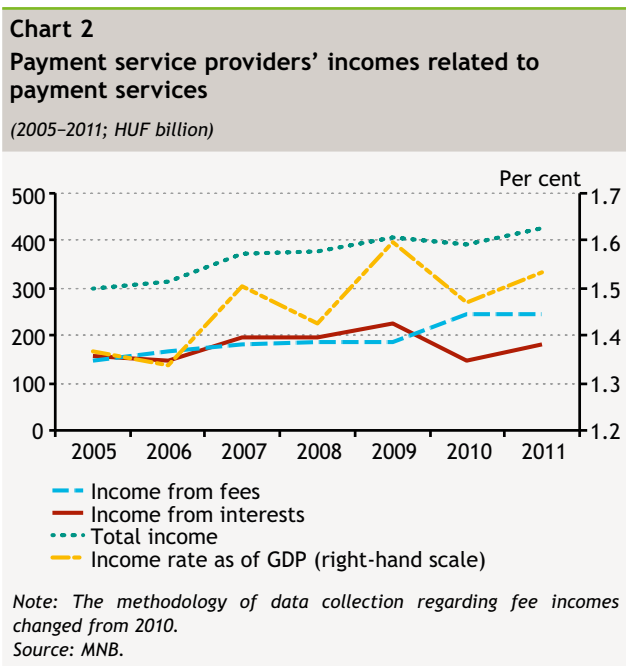
The following section discusses the changes in credit transfer fees after the introduction of the intraday credit transfer.

CHANGES IN CREDIT TRANSFER FEES UPON THE INTRODUCTION OF THE INTRADAY CREDIT TRANSFER

The money market crisis that started in the autumn of 2008, the surtax imposed on banks and the preferential prepayment of foreign currency loans resulted in a decline in banks' lending activity, a considerable deterioration in the quality of the existing portfolio and a significant fall in the profit of the banking sector. Economic factors other than the introduction of the intraday credit transfer (such as the introduction of the financial transaction tax) further increase the chance that banks will offset their lost incomes by raising their fees. The fall in float due to the 4-hour rule also results in a decline in profit, and prompts banks to raise their fees. Although it can be concluded that many factors point to price rises, our analysis below is limited only to the possible fee increase resulting from the introduction of the intraday credit transfer.

As the bank fee charged for a specific credit transfer may depend on many parameters (minimum, maximum fees and fees based on value), there are many ways to implement a price increase. For example, banks may increase the minimum fee and reduce the maximum fee, emphasising the latter to their customers. As the information about the volume and value of their customers' credit transfers is available for banks, they can make precise calculations, whereas customers typically do not prepare such deep calculations regarding their own turnover.

It is extremely difficult to estimate at banking sector level the magnitude of the fee increase due to the introduction of the intraday credit transfer. The underlying reason for this is the existence of a high number of fee packages and individual conditions and the fact that only the individual banks know (1) how many customers use the individual fee packages, (2) what size of turnover the customers belonging to each account package have, and (3) what the composition of this turnover is. In addition, difficulties are raised by the existence of cross subsidisation across various services, which allows banks to make their customers pay their costs through the prices of other bank services, instead of account management services.



Relying on the data available, below we try to estimate the size of the price increase due to the introduction of the intraday credit transfer. Looking at the fee types described above, we can conclude that there are several types of fee increases. For example, raising only the minimum fees may also result in a fee increase for customers, depending on the value band the amount intended to be transferred falls into. We strived to take all of this into account in our estimation. The distribution of the values of interbank transactions is available for the MNB, and so we calculated what price increase this may mean at individual banks in the case of the fee packages with the lowest monthly fee. The reason why we analysed these ones is that there are many packages that contain free of charge services in exchange for a fixed monthly fee. In the case of these packages, it would be difficult to prove which service included in the package caused the change in the fee. We think that the change in prices can better be observed in the case of fee packages where the monthly fixed fee is minimal, so the possibility of cross subsidisation across services is lower.

In the case of these fee packages, banks increased their credit transfer fees per one transaction from HUF 143.16 to HUF 146.66, i.e. by HUF 3.5, corresponding to a total 2.45 per cent. Although this size of increase equals the estimate prepared on the basis of the cost survey concerning the introduction of the system conducted prior to the project, the situation is in fact more favourable due to the preferential/fixed-fee packages. We cannot speak about a fee increase in the case of the zero-cost account packages, where customers are granted free payment services and credit transfers in exchange for a regular monthly credited sum directed to their bank account (here the bank also covers its costs from incomes from cross subsidisation). This points to the fact that the total average fee increase related to the intraday credit transfer is in fact lower than the HUF 3.5 quantified in the case of the selected account packages. Our estimate also leads to the conclusion that banks have not even shifted a part of the ceasing of their float income to their customers, as (according to our calculations) they would have been able to do so only through a much higher fee increase, exceeding HUF 20. Accordingly, the ceasing of the float income, which used to amount to some HUF 3 billion a year, has turned into savings for banks' customers.

Banks must announce changes in their general terms and conditions and lists of conditions to their customers 60 days prior to entry into force. As the 4-hour rule resulted in considerable changes in the operation of banks, they

already published the amendments to their general terms and conditions at end-April 2012.

It is a statutory regulation for banks⁵ that fees and costs may only be amended due to a reason that has an actual impact on the size of the given fee or cost. Therefore, for banks it is expedient to increase their fees when their costs change, otherwise it becomes much more difficult for them to prove justifiability. Accordingly, numerous banks amended their lists of conditions at end-April 2012 (with entry into force in July). Therefore, we believe that a comparison of the 2011 lists of conditions and the ones amended between April and July 2012 allows well-founded conclusions to be drawn regarding the sizes of increases in the fees to be paid by customers due to the introduction of the intraday credit transfer.

The comparison of the previous conditions valid between April and October 2011 and the new conditions reveals that **there was some increase** in credit transfer fees at some banks, but several banks left their conditions unchanged. It is interesting that although **several banks raised the fees for bank branch (paper-based) credit transfers in the case of certain account packages, their fees for electronic transfers remained unchanged** compared to 2011. However, there was a bank that increased the fees of electronic transfers.

Payment services fees were raised again in early 2013, but these increases are typically attributable to the introduction of the financial transaction tax and not to the intraday credit transfer.⁶

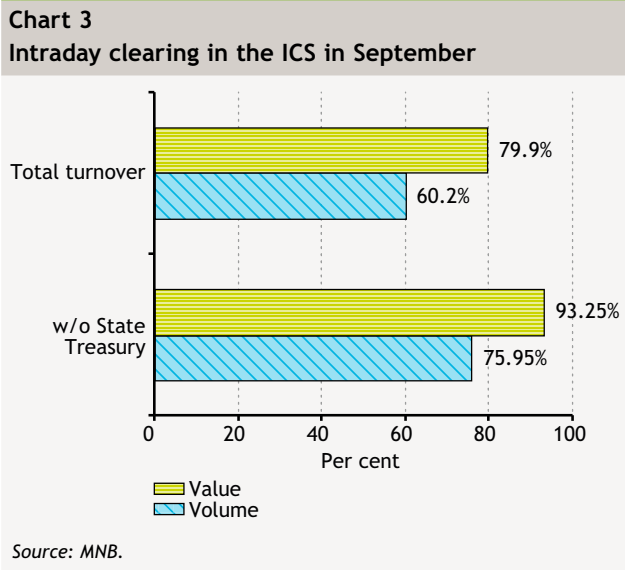
EXPERIENCES OF THE INTRADAY CREDIT TRANSFER

The intraday ICS clearing that allows for compliance with the Decree started at the time set by the MNB, i.e. upon the entry into force of the 4-hour rule. As this was a very radical change in the operation of banks and GIRO Zrt., minor incidents occurred, but those concerned were able to solve them, so banks' customers did not even perceive them.

In terms of its operation, the new system passed the exam. Clearing of a cycle typically took 8–10 minutes (including waiting for the arrival of the cover funds as well); the cycle with the highest turnover (497,000 items) to date also remained within 15 minutes. Clearing takes longer only if the provision of cover funds has to be waited for (but, as described below, it happens rarely).

⁵ Article 210 (4) of Act CXII of 1996 on Credit Institutions and Financial Enterprises.

⁶ It was observed in this case as well that banks scheduled their fee changes in line with the changes in circumstances.



Based on September data, of all the transactions cleared in the ICS, 60 per cent in terms of volume and 80 per cent in terms value were settled in the course of the day. At the same time, the 4-hour rule does not apply to the Hungarian State Treasury (MÁK). Excluding the Hungarian State Treasury, 76 per cent of all transactions in volume and 93 per cent of them in value were settled in the course of the day (the rest comprises paper-based and debit type transactions, e.g. direct debits).

Although no increase in volume can be detected, the turnover of the ICS in value increased considerably, by HUF 1,000 billion per month on average. Previously, banks were concerned that the ICS would take items from the VIBER turnover. These concerns were justified as there are many high-value corporate transfers that require intraday settlement, but not necessarily a real-time one. A detailed review of the turnover data reveals that there was a considerable increase in the number of very high-value

(above HUF 1 billion) transactions; therefore, in all probability, these items had previously typically been settled in VIBER. However, this cannot be detected in the turnover of VIBER (as it amounts to approx. HUF 1,300,000 billion a year, and the change is much smaller than the natural monthly fluctuation observed in VIBER).

As early as in 2007, the MNB requested ad hoc data supply from the largest banks regarding the intraday distribution of the number of transactions.

In the first months it is already worth examining what picture of customers' intraday credit transfer activity is drawn on the basis of the turnover of individual cycles of the intraday clearing, and how it compares to the practice observed earlier (Table 1).

The data show that the only significant change between the two years under review is that a lower percentage of customers submit their credit transfer orders early in the afternoon, while the percentage of the number of orders given later or only at the beginning of the next day increased considerably. Accordingly, on the basis of the table we may conclude that the greatest portion of retail customers' transfers is executed in the first cycle in the intraday credit transfer system. The exact reason for the intraday rearrangement of the times of orders is unknown, but as the data of comparison are old (2007), it is not necessarily attributable to the intraday credit transfer system. It is more likely that the number of non-paper based retail credit transfers has grown continuously since 2007, and as a significant portion of retail customers (especially those who apply Internet banking solutions) submit their credit transfer orders late in the afternoon or in the evening, this process naturally resulted in the shift seen in the table. This is also shown by the fact that the average value of transactions (around HUF 170,000) is the

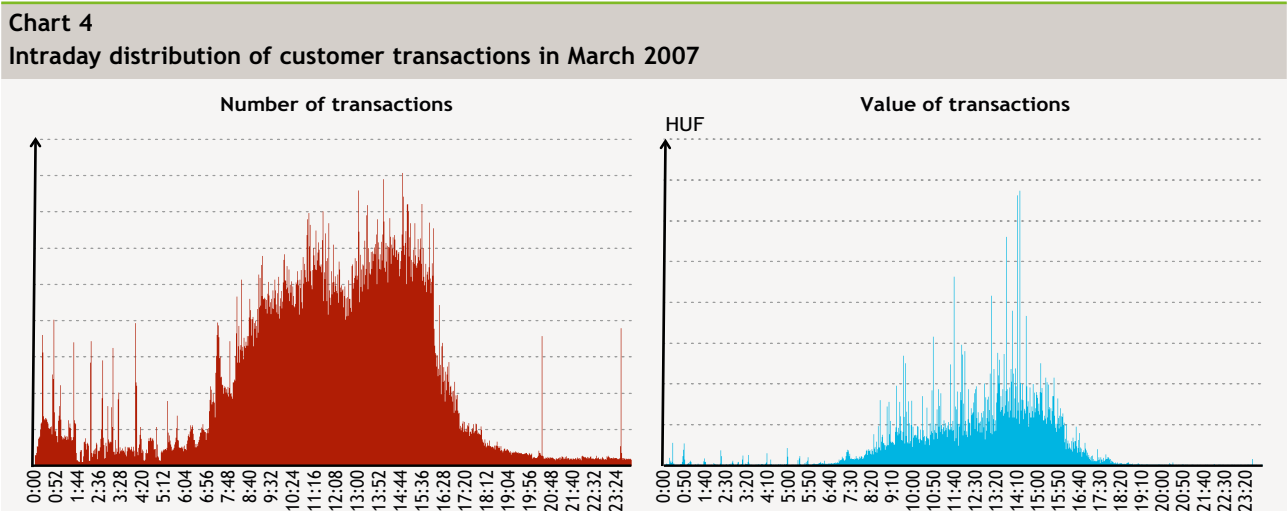


Table 1
Intraday distribution of the transfer turnover in 2007 and 2012

| Cycle* | 2007** | | 2012*** | | Difference | |
|---|--------|---------|---------|---------|------------|---------|
| | ea (%) | HUF (%) | ea (%) | HUF (%) | ea (%) | HUF (%) |
| Items submitted between approx. 16:00 hours and approx. 08:00 hours next morning (at present, they are executed in cycle 1 [08:30] of the intraday credit transfer) | 24.13 | 11.29 | 32.33 | 15.07 | 8.2 | 3.78 |
| Items submitted between approx. 08:00 and 10:00 hours (at present, they are executed in cycle 2 [10:30] of the intraday credit transfer) | 15.16 | 12.9 | 15.69 | 14.87 | 0.53 | 1.97 |
| Items submitted between approx. 10:00 and 12:00 hours (at present, they are executed in cycle 3 [12:30] of the intraday credit transfer) | 19.52 | 18.92 | 18.13 | 20.74 | -1.39 | 1.82 |
| Items submitted between approx. 12:00 and 14:10 hours (at present, they are executed in cycle 4 [14:40] of the intraday credit transfer) | 19.52 | 27.63 | 19.18 | 25.2 | -0.34 | -2.43 |
| Items submitted between approx. 14:10 and 16:00 hours (at present, they are executed in cycle 5 [16:30] of the intraday credit transfer) | 21.68 | 29.26 | 14.67 | 24.13 | -7.01 | -5.13 |

* The cut-off times indicated in the table are for guiding purposes only; individual banks may depart from them.

** Estimate on the basis of a March 2007 survey.

*** Based on actual data of September 2012 (but other months also show a similar picture).

lowest in the first cycle, suggesting a preponderance of retail orders, whereas the much higher average value of the last cycle (approx. HUF 601,000) indicates the dominance of corporate orders.

An important question in intraday clearing was how able banks would be to manage their liquidity. Preliminary liquidity simulations showed that this would not cause any problem, although there are many banks that circulate the multiple of their respective account balances on the same day in VIBER. In spite of the fact that the credit line provided by the MNB against securities collateral greatly facilitates the performance of the turnover, and the turnover value of the ICS is negligible compared with that of VIBER, theoretically it may still happen that money market items 'take away' the funds from the low value clearing (and the temporarily uncovered position may delay ICS clearing). Of the 310 cycles completed in the period between July and September 2012:

- it happened on 3 occasions that the funds did not arrive during the day in the designated 10-minute period; in this case the items of the bank concerned⁷ are executed in the next cycle (but even in these cases, the 4-hour rule was not breached);
- it happened on 2 occasions that the provision of funds had to be waited for at the end of the day (in the most important period for treasuries).

Accordingly, we think that the system's parameters related to the provision of funds are adequate and work well.

OTHER FAVOURABLE EFFECTS OF THE INTRADAY CREDIT TRANSFER

We explained in the previous chapter that there are effects of the intraday credit transfer that can already be measured. In addition, however, there are future effects that are difficult to measure, which are also expected to belong to the group of favourable effects. They are outlined below.

The main objective of the 4-hour rule was to attain a significant increase in service level in payment systems. The increase in the service level is an effect that can be quantified only partly, although everyone 'feels' its positive consequences.

For the time being, the use of the system only covers the simplest transactions. The underlying reason is that the special Hungarian payment methods (transfer of funds by the order of authorities, direct debit) also have to be adjusted to the international message standard. As they account for a smaller portion of the turnover, the MNB did not want any delay in launching the intraday credit transfer because of the adaptation of these payment methods. **However, within not more than 3–4 years it will be expedient to clear all types of transactions in the new system.** Then the night clearing will become empty and cease to exist, and debit type transactions will also be executed in the course of the day.

The shortening of execution has a risk-reducing effect, as it may be able to substitute for cash in higher-amount transactions. With regard to this issue, the MNB is of the

⁷ The number of transactions here is only in the magnitude of a hundred.

opinion that it will be worthwhile to further increase the frequency of clearing in the future, because this reduces risks.

As intra-bank items will not be received (significantly) earlier than now, larger banks' competitive advantage due to the time factor will cease to exist. Since the ICS fee is much lower than what typically appears as a difference in bank fees between intra- and extra-bank transfers, **the MNB expects a strengthening in interbank competition.**

Intraday credit transfers may provide an opportunity for corporations to reduce the balance of their current account and take it over to another instrument that has a better yield, provided that they have a credit limit at their banks. As there is no interest on the intraday credit limit, if the balance of the account is positive again at the end of the day, the account balance held previously because of the T+1 turnover can be reduced. However, as our statistics show, customers do not use this opportunity yet.

The intraday credit transfer is based on a message standard that has a much wider data content and can be much more flexibly shaped than the previous one. This allows companies as well to change their accounts receivable and payable analytics in a way to considerably reduce manual work.

Accordingly, intraday clearing may have numerous positive impacts, whose magnitude cannot yet be precisely determined due to the complexity of the issue and the shortness of time that has elapsed.

CONCLUSIONS

The MNB launched the project that aimed at the reform of bank and interbank systems after lengthy preparatory work. During the project, the systems of more than 150 financial service providers concerned had to be modified and tested. This required both significant investment and considerable external and internal human resources investments from the participants, entailing a cost increase for banks.

However, due to the enormous number of transactions that bear these costs we thought that the cost increase would be insignificant. Based on the investment costs estimates requested from banks, **the MNB estimated the production cost increase per transaction to amount to HUF 3.4.** It was uncertain for the MNB as well whether due to lower profits as a result of the financial crisis and due to other burdens carried by banks they would considerably raise the fees to be paid by customers, so we wanted to measure it in any case. This is not a simple task because of the

significant cross subsidisation and the fee packages the monthly charge of which is higher but which contain many 'free' transactions in exchange, as sufficiently detailed information is not available. According to our calculations, in the packages with a minimum monthly fee (containing no 'free' transactions) **the cost of transfers increased by an average HUF 3.5**, which is very close to our earlier estimate. This figure seems to be especially good considering that banks lost most of their income from the money in transit (float) when the system was launched.

The past half year demonstrated that the completed system passed the exam, works reliably and its operation has become a routine. The MNB considers it a great achievement that banks chose a 2-hour clearing period instead of the 4-hour one required by the MNB Decree, which practically means that in normal operation **transactions reach recipients in not more than 2 hours.** Transactions submitted at the 'luckiest' time might as well reach the other bank account in 10–20 minutes. As a result, the execution time of transfers shortened considerably, and customers also seem to have adjusted themselves to it: firstly, submission practices changed to some extent; secondly, the value of transactions performed through the ICS increased significantly.

In our opinion, the shorter execution time will strengthen interbank competition for customers against the execution within the same bank, which has been a real-time operation for long.

As interbank transactions are already based on the flexibly changeable xml standard, which is applied in the SEPA payment methods as well, this allows the wide spreading of automation from customer to customer in the case of transfers as well.

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Szilárd Erhart, Imre Ligeti and Zoltán Molnár: Reasons for the LIBOR review and its effects on international interbank reference rate quotations

In 2012, news related the manipulation of LIBOR¹ directed the attention of authorities and the general public to interbank reference rates. International reviews made it clear that a reform of LIBOR and the numerous reference rates that follow the methodology of LIBOR is necessary, because changes in reference rates influence the payment terms of thousands of billions in loans and other financial agreements. Rapid and at the same time radical changes cannot be expected in the short run, because preparation of the changes poses a regulatory challenge that requires complex, international cooperation. In order to restore confidence, as of 2013 the British authorities intend to strengthen LIBOR by the introduction of a statutory regulation, and they are also planning to designate a new, independent administrator and to drastically cut the number of quotes. Overall, our study confirms the findings of earlier analyses prepared by the Magyar Nemzeti Bank, according to which BUBOR² shows the real market conditions as an average of longer periods, but at present its ability to provide a short-term forecast of interest rate steps is limited.

INTRODUCTION

LIBOR and similar interbank reference rates were originally created in the 1980s in order to facilitate the pricing of syndicated dollar loans. Prior to that, US Treasury bill rates had been used for pricing, but fluctuations in issued quantities and risk appetite diverted the Treasury bill rates from banks' real costs of funds. Later, LIBOR, which satisfied market needs to a high degree, and other reference rates that followed the methodology of LIBOR, gradually became increasingly popular. In 2011, the value of contracts based on LIBOR was close to USD 270 trillion (almost the quadruple of the total GDP of the world).

However, due to tight market liquidity, the setting of interbank rates has been difficult since 2008, which may hinder the precise pricing of loans and derivative contracts. At the same time, in the summer of 2012, confidence in interbank reference rates continued to decline due to the manipulations of LIBOR and EURIBOR.³ All of this made it necessary to review the international rate quotation methodology and BUBOR, which is determined in line with that.

Our analysis presents the role of LIBOR and BUBOR in financial markets. We describe the reasons for and consequences of the LIBOR affair, as well as the questions and conclusions of international reviews formulated to date. There is agreement among the domestic and international professional audience that due to interbank market constraints as well as the anomalies of quoting procedures and the LIBOR affair, a review of the reference rates is necessary, and the reforms following the investigations will have to be implemented in an internationally coordinated manner. In connection with that, we summarise the LIBOR regulation proposals set out in the Wheatley Review (2012b) and entering into effect in 2013, which relate to the designation of a new, independent administrator and the introduction of quotes based on transaction data in order to eliminate distortions stemming from expert estimates. A further plan is a drastic reduction of the number of LIBOR currencies and tenors.

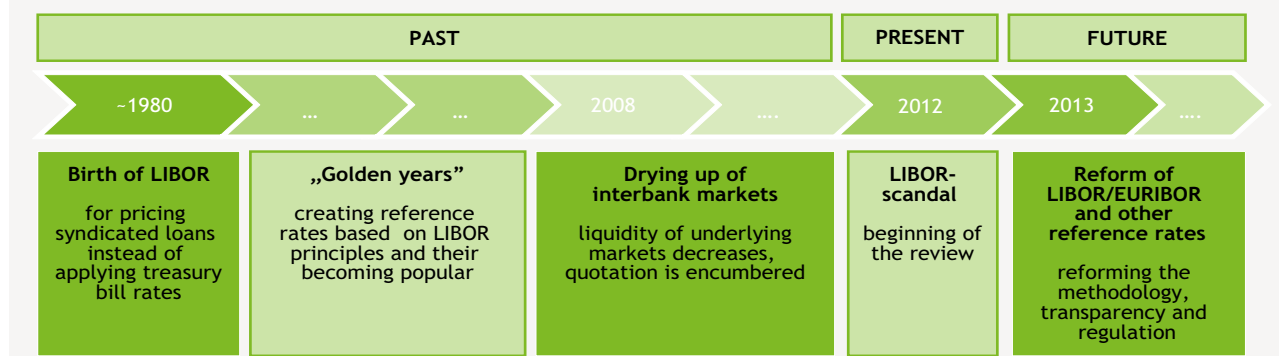
The review of the BUBOR setting methodology started in recent months, in parallel with the international reforms. In terms of both monetary policy and financial stability, it is of key importance that the BUBOR quotes remain

¹ LIBOR: London Interbank Offered Rate.

² BUBOR: Budapest Interbank Offered Rate, a forint-denominated Budapest interbank reference rate.

³ EURIBOR: Euro Interbank Offered Rate, an interbank reference rate denominated in euro.

Chart 1
Past, present and future of LIBOR and interbank reference rates



reliable indicators of interest rate conditions. Our current study confirms the findings of earlier published analyses prepared by the Magyar Nemzeti Bank, according to which BUBOR quotes show the real market conditions as an average of longer periods, but since 2009 their ability to provide a short-term forecast of interest rate steps has been limited.

THE ROLE AND QUOTATION METHODOLOGY OF INTERBANK REFERENCE RATES

The role of LIBOR and BUBOR in money markets and the economy

LIBOR, as a reference rate quoted for the leading currencies of the world for various maturities, influences the pricing of financial products amounting to approximately USD 300

trillion (300×10^{12}) (Table 1). Within that, interest rate swaps (IRS) account for a dominant share.

In Hungary, starting from the introduction of BUBOR in 1996, banks have essentially priced their corporate and mortgage loans on the basis of BUBOR. According to the MNB's estimates, the majority of corporate forint loans, which presently amount to HUF 2,700 billion, have variable interest rates tied to BUBOR, while the share of such rates in household forint loans,⁴ which amount to HUF 4,000 billion, is low, and has started to increase only recently.⁵ In the past decade, BUBOR played an important role in determining the contract terms and conditions of derivative products (forward rate agreements, interest rate swaps etc.) as well. While no highly reliable data on the BUBOR exposure of domestic banks' loans are available, based on the central bank K14 statistics we have detailed data on the interest rate swaps recorded off-balance-sheet. Of the

Table 1
Value of contracts based on LIBOR
(USD trillion)

| Instruments | Value |
|---|-------|
| Exchange-traded interest rate futures and options | 30 |
| Floating rate notes | 3 |
| Forward rate agreements (FRA) | 28 |
| Interest rate swaps (IRS) | 198 |
| Syndicated loans | 10 |
| Total | 269 |

Source: Wheatley Review, 2012b.

⁴ Reference is made to BUBOR, inter alia, in Act CXII of 1996 on Credit Institutions and Financial Enterprises, Act LXXV of 2011 on the Fixing of Exchange Rates Used for Repayments of Foreign Exchange-denominated Mortgage Loans and the Administration of Forced Sales of Residential Property, Act IV of 2009 on Government Guarantee on Non-performing Home Purchase Mortgage Loans, Act CVI of 2007 on State-owned Assets, Government Decree No. 250/2000. (XII. 24.) on Special Provisions Regarding the Annual Reporting and Book-keeping Obligation of Credit Institutions and Financial Enterprises, Government Decree No. 215/2000. (XII. 11.) on the Special Provisions Regarding the Annual Reporting and Book-keeping Obligations of Investment Funds, Government Decree No. 251/2000. (XII. 24.) on the Special Provisions Regarding the Annual Reporting and Book-keeping Obligations of Investment Enterprises.

⁵ The above values are from the publication 'MNB (2012)'.

Table 2
Domestic interest rate derivative turnover and contract sizes

(January 2009–September 2012)

| | FRA | | | IRS | | | CIRS | | |
|---|--------|-----------------|-----------------|--------|-----------------|-----------------|-------|-----------------|-----------------|
| | Total | BUBOR (3 month) | BUBOR (6 month) | Total | BUBOR (3 month) | BUBOR (6 month) | Total | BUBOR (3 month) | BUBOR (6 month) |
| Value of transactions (HUF Bn/year) | 13,630 | 9,268 | 4,361 | 5,716 | 1,180 | 4,536 | 1,679 | 1,617 | 62 |
| Number of transactions per year | 900 | 540 | 360 | 1,475 | 150 | 1,325 | 161 | 157 | 4 |
| Average value of a transaction (HUF Bn) | 15 | 17 | 12 | 3.9 | 7.9 | 3.4 | 10.4 | 10.3 | 15.1 |
| Average number of transactions per day | 3.5 | 2 | 1.5 | 5.9 | 0.6 | 5.9 | 0.6 | 0.6 | 0.01 |
| Total value (HUF Bn, 30 June 2012) | 10,050 | | | 19,600 | | | 5,420 | | |

products based on BUBOR, FRA transactions,⁶ and within that the 3-month ones tied to BUBOR, have the highest turnover; in terms of the amount, however, interest rate swaps (IRS) are determining.⁷

Interbank reference rates are of key importance for the central bank, not only in terms of the pricing of financial products but also as indicators of short-term interest rate expectations. This is due to the fact that the initial step of monetary policy intervention is the influencing of market interest rate conditions and interest rate expectations. (Regarding the role of BUBOR in measuring interest rate expectations see the part entitled *Market functioning constraints and the impact of the LIBOR affair on interbank reference rates* below.)

Current international practices in the setting of reference rates

Starting from the 1980s, the appreciation of the London market and LIBOR have been facilitated by both the position

of the London time zone between the major markets and the development of the euro financial markets. Later, interbank reference rates relying on the LIBOR methodology were introduced in very many countries.

The most important features of interbank quotes: the term of the interbank transaction they apply to, the institutions whose quotes are used and the applied calculation methodology. Another important aspect in comparing quotes is whether the quote relates to the lending or borrowing of interbank funds and whether there is an obligation to contract in connection with the quotes.

LIBOR – by definition – gives the costs of funds of market maker banks, whereas other interbank reference rates provide information about the interest rates of interbank deposits of market makers (see the box below). A further difference is that in some countries the transactions between the best, premium banks have to be taken into account (euro area, Japan), whereas in other cases the transactions of the market maker bank are taken into account.

Definition of interbank interest rate quotations

BUBOR (Hungarian Forex Association): the interest rate an interbank loan offered by the reporting agent.

EURIBOR (European Banking Federation): EURIBOR is the rate at which euro interbank term deposits are being offered within the EMU zone by one prime bank to another at 11:00 a.m. Brussels time ("the best price between the best banks"). It is quoted for spot value (two Target days) and on actual / 360 day basis.

LIBOR (British Bankers' Association): At what rate could you borrow funds, were you to do so by asking for and then accepting interbank offers in a reasonable market size just prior to 11 am.

⁶ FRA: forward rate agreement.

⁷ An analysis by Kocsis et al. (2012) is expected to be published in the *MNB Occasional Papers* series in 2013.

MATURITIES: The banks of the contributor panel submit the quotations for numerous maturities (15 maturities from O/N to 12-month in the case of LIBOR/BUBOR/EURIBOR). In some countries, however, the reference interest rates apply only to fewer, 8–10 maturities of up to one year (Table 3). During quoting, the most frequent maturities are the 1-week, 1-month, 3-month, 6-month, 9-month and 12-month maturities, as the majority of the underlying financial products (loans, derivatives etc.) are priced according to these maturities. International surveys suggest that usually the 3-month and 6-month maturities are the most important.

PANEL BANKS: In setting the quotations, a large sample (of 8–45 banks) is usually taken, compared to the size of the given market. Fundamentally, the banks are selected on the basis of their market turnover. Quoting is always carried out with the involvement of domestic banks. However, quotes of foreign banks are also often taken into account. Theoretically, a larger sample has better statistical properties. However, due to the market concentration, taking account of the quotes of inactive banks in the calculation of the mean value is not necessarily advantageous. The composition effect may greatly influence the value of interbank reference rates – especially in the interbank market, which becomes segmented in stress situations. For example, during EURIBOR submission, market makers have to give account of the pricing of premium banks' depositing, while non-premium banks, which face higher credit risk premiums, constitute an increasing portion of the euro area financial system. In the case of LIBOR, submitting banks have to give account of their own costs of funds. The definition of BUBOR is very similar to that of EURIBOR, as in both cases it is the given market maker's offer rate for unsecured lending.

TRIMMING: Most quoting procedures ignore the extremely low and high quotes during the setting of the interest rate (trimming), which reduces the possibility of manipulation and the pass-through of the volatility of individual banking transactions. If the number of market makers is low, the institution that coordinates the quoting also has less room for manoeuvre to apply trimming. Therefore, in Sweden and some Asian countries they calculate non-trimmed averages, and the extent of the trimming depends on the number of market makers.

ONSHORE AND OFFSHORE MARKETS: In the case of LIBOR, in addition to the domestic currency, quotes for foreign currencies are also published. In the cases of the euro, the Japanese yen and the Swedish crown, domestic as well as

foreign quotes exist, with different market makers. In certain countries, the offshore London market has even become more important. For example, the operational interest rate target of the Swiss National Bank (SNB) refers to the LIBOR CHF interest rate quotations. An advantage of the offshore market may be that it is less exposed to regulations (capital constraint, minimum reserve, etc.), and it is easier to leave or enter (Gyntelberg and Wooldridge, 2008).

CONTRACTING OBLIGATION: Considering that the quoting is not based on real market transactions, certain regulations impose a contracting obligation on the partners. Pursuant to the quotation rules of the Polish (WIBOR) and Romanian (ROBOR) reference rates, the quoting obligation amounts to HUF 120–2,100 million (WIBOR: PLN 5–30 million; ROBOR: RON 2–5 million). The amount of the quoting obligation declines as a function of the tenor.

QUOTING DIRECTION: Quotes in the case of certain reference rates indicate how much it would cost the given bank to borrow (LIBOR), whereas in other countries they show the price of its lending (BUBOR, CIBOR,⁸ EURIBOR and NIBOR⁹). The Czech, Polish and Romanian reference rates are quoted in both directions (borrowing and lending rates), and the Polish and Romanian Central Banks require a 20–75 basis point maturity-dependent maximum spread as well.

REFERENCE: Market participants' choices in certain cases may show how liquid they consider individual segments of the money market to be. In the case of IRS products, for the largest currencies the interbank quotes mean the reference rate. At the same time, this role is played by other interest rates in the Asian and Pacific region, the expected interest rate of bank bills in Australia, the implied interest rate of FX swaps in the Philippines, Singapore and Thailand, while in China the reference is the interest rate of repurchase agreements (Gyntelberg and Wooldridge, 2008).

Chart 2 depicts the four main stakeholders of the quoting of reference rates and its six-step process. Stakeholders in the quoting are (I) the issuer of the reference rate (the Hungarian Forex Association (MFT) in the case of BUBOR), (II) the members of the contributor panel, (III) the institution that carries out the calculation and the publication (the MNB in the case of BUBOR) and (IV) the users of the reference rate (financial market participants, households and corporations that rely on the reference rates upon elaborating the conditions of financial contracts). The issuer is responsible for the development of the methodology

⁸ CIBOR stands for Copenhagen Interbank Offered Rate, i.e. the Copenhagen interbank reference rate denominated in Danish crowns.

⁹ NIBOR stands for Norway Interbank Offered Rate, i.e. the Norwegian interbank reference rate denominated in Norwegian crowns.

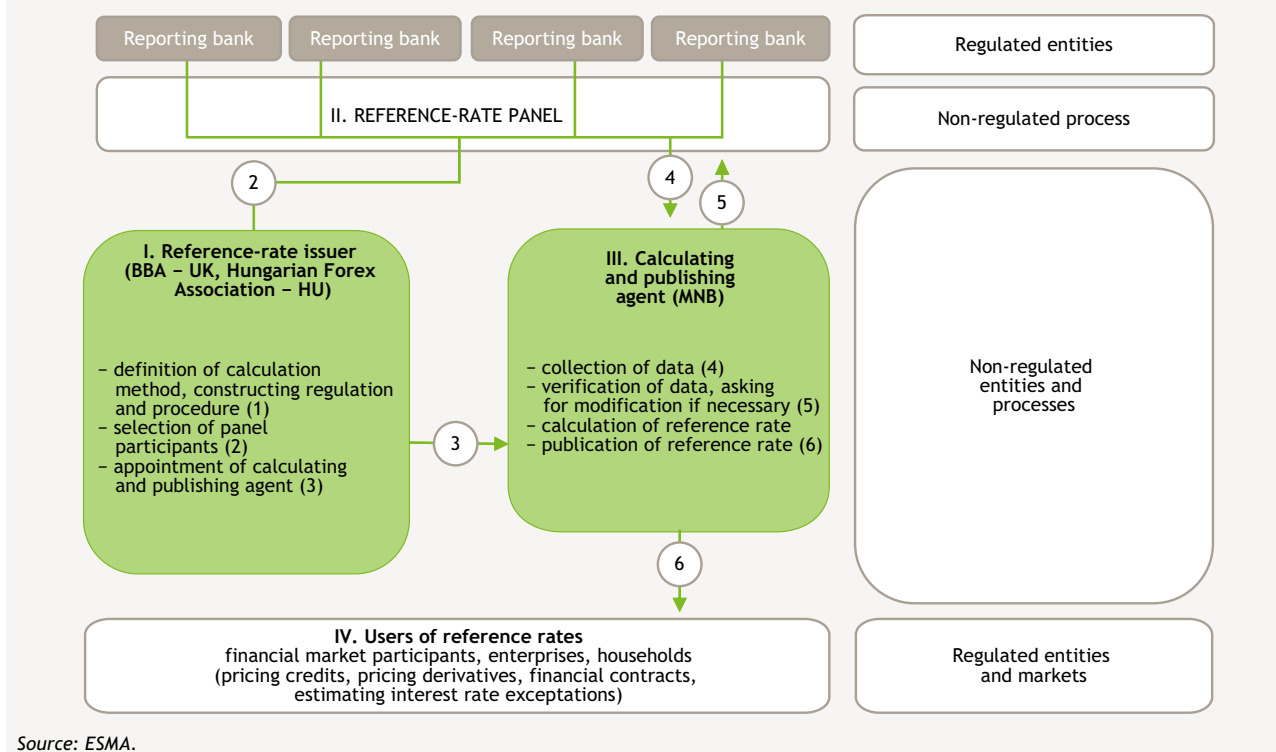
| Instrument | BUBOR | LIBOR | PRIBOR | EURIBOR | WIBOR | ROBOR | CIBOR | NIBOR | STIBOR | TIBOR |
|---------------------------|---------------------|--|----------------------------------|-------------------------------|--|---|---|--|--|-----------------------------------|
| Country | Hungary | United Kingdom | Czech Republic | Eurozone | Poland | Romania | Denmark | Norway | Sweden | Japan |
| Currency | HUF | 10 currencies (JPY, USD, GBP, EUR, CHF, CAD, AUD, NZD, DKK, SEK) | CZK | EUR | PLN | RON | DKK | NOK | SEK | JPY |
| Size of panel (Sep. 2012) | 16 | 8-16 (depends on the currency) | 8 | 44 | 13 | | 9 | 6 | 6 | 16 |
| Type | quotation | quotation | quotation | quotation | quotation can be transacted (between 5 and 30 PLN million depending on the maturity) | quotation can be transacted (between 2 and 5 RON million) | quotation | quotation | quotation** | quotation |
| Number of maturities | 15 | 15 | 9 | 15 | 9 | 8 | 14 | 10 | 8 | 13 |
| Key maturity* | 3 month | 3 month | | 6 month | | | 6 month | 6 month | 3 month | 3 month |
| Trimming | ~ Lower / Upper 25% | ~ Lower / Upper 25% | depends on the number of quoters | Lower / Upper 15% | ~ Lower / Upper 25% | - | Lower / Upper 15%, average if number of quoters is less than 11 | Lower / Upper 25%, average if number of quoters is less than 5 | if difference between maximum and minimum is more than 25 bp | Lower / Upper 12,5% |
| IRS reference rate | yes | depends on the currency | yes | yes | yes | | yes | yes | | no (reference rate is JPY LIBOR) |
| Sanctions | disqualification | | disqualification | disqualification | disqualification | disqualification | disqualification | the case is proposed to the bank association | | |
| Lending or borrowing | lending | borrowing | borrowing/lending | lending (among premium banks) | borrowing/lending (spread is maximised) | borrowing/lending (spread is maximised) | lending | lending | lending | transaction between premium banks |

* Based on Gyntelberg and Wooldridge (2008).
 ** Quoting obligation was in force until 29 October 2008 (SEK 500 million up to 6-month maturity; SEK 100 million for maturities of 9-12 months).
 Sources: Banking associations, central banks, BIS.

(step 1) as well as for the selection of the contributor panel and the institution that does the calculation and the publication (steps 2 and 3). The market makers are responsible for the submission of the interbank interest rate quotes that comply with the regulation (step 4), while the institution that performs the calculation is responsible for the completion of the necessary calculations and the formal control of the quotations (step 5) as well as for the

publication of the reference rate (step 6). In international practice, the work of the contributor panel as well as the work of the issuing institution and the calculating institution are usually unofficially regulated. In Hungary, the regulation prepared by the MFT, which works as an NGO, contains the rules of procedure. However, in the opinion of the European Securities and Markets Authority (ESMA), it may be necessary to regulate the process of quoting in provisions of law –

Chart 2
Stakeholders and flow chart of quoting



reacting to the criticism expressed in connection with the LIBOR affair.

MARKET FUNCTIONING CONSTRAINTS AND THE IMPACT OF THE LIBOR AFFAIR ON INTERBANK REFERENCE RATES

In an optimal situation, in addition to the expected central bank interest rate path, reference rates similar to BUBOR/LIBOR are also influenced by other factors that arise during interbank market transactions (counterparties' credit risk, liquidity and term premiums) and by the quotation procedure¹⁰ (rate-setting methodology, transparency, etc.).

At the same time, the bias-free setting of LIBOR/BUBOR is hindered by several factors in the procedure:

- limited market liquidity and mobility between markets,
- manipulations, LIBOR affair.

Market liquidity and mobility between markets are limited

Especially since the 2008 crisis, the liquidity of interbank markets relevant in terms of the setting of BUBOR/LIBOR has been concentrated on maturities shorter than 1 month¹¹ (Table 4). In the 2008–2009 stress period, the intermediate role of interbank markets was taken over by central banks by changing their liquidity management instruments, and although the functioning of markets has been re-established, the role of central bank liquidity management instruments has remained more important compared to the pre-crisis period. The preparation of quotations has also become more difficult by the fact that passage between markets has become more hindered. As a result, 'expert estimates' have become increasingly important in the preparation of quotations, especially in the case of maturities longer than 1-2 months, and the risk of distortion of the reference rate has increased considerably. All of this limits the reference rates in meeting market needs, because the related financial pricing activity is tied to the 3–6-month maturity.

¹⁰ The quotation procedure is described in detail in the previous section.

¹¹ In Hungary, overnight transactions dominate, 99 per cent of which are shorter than 2 weeks.

Table 4
Transactions underlying LIBOR and BUBOR in 2011

| | O/N | 1 week | 2 week | 1 month | 2 month | 3 month | 4 month | 5 month | 6 month | 7 month | 8 month | 9 month | 10 month | 11 month | 12 month |
|-------------|-----|--------------|--------|-----------------------|---------|---------|---------|---------|-------------------|---------|---------------|---------|----------|----------|----------|
| USD | | | | | | | | | | | | | | | |
| GBP | | | | | | | | | | | | | | | |
| EUR | | | | | | | | | | | | | | | |
| JPY | | | | | | | | | | | | | | | |
| CHF | | | | | | | | | | | | | | | |
| CAD | | | | | | | | | | | | | | | |
| AUD | | | | | | | | | | | | | | | |
| NZD | | | | | | | | | | | | | | | |
| SEK | | | | | | | | | | | | | | | |
| DKK | | | | | | | | | | | | | | | |
| BUBOR (HUF) | | | | | | | | | | | | | | | |
| | | low activity | | moderate-low activity | | | | | moderate activity | | high activity | | | | |

Source: Wheatley Review, The (2012b), MNB.

Manipulations, LIBOR affair

Interest rate quotations were especially unfavourably affected by the eruption of the scandal related to LIBOR and EURIBOR quotes in the summer of 2012. The British Financial Services Authority (FSA) fined Barclays Bank because it breached several Principles for Businesses of the former:

- 1. taking account of derivative positions:** during setting its quotations, the Barclays took into consideration the revaluation of derivative positions in the period between early 2005 and mid-2008;¹²
- 2. fear of stigma, distorting the quotes in order to improve the reputation of the bank:** as the LIBOR quotes are based on the costs of funds of the market maker bank (see the definition of LIBOR in the previous section), in the crisis situations between September 2007 and May 2009 Barclays attempted to paint a better picture of its credit risk than the real one by reporting lower borrowing costs than the actual costs (this risk does not exist in the case of EURIBOR and BUBOR, because banks report the interest rates of the loans they extend and not of their costs of obtaining funds);
- 3. intention to influence the pricing of other market makers:** the misdemeanour of abuse was exacerbated by the fact that the bank instigated other market makers as well to behave unethically;

- 4. lack of risk management controls:** according to the findings of the FSA, Barclays did not have effective risk management controls upon setting LIBOR and EURIBOR.

THE FIRST STEPS OF THE REVIEW OF REFERENCE RATES

There is agreement among the domestic and international professional audience that, due to the anomalies of interbank market constraints and quoting procedures as well as the LIBOR affair, a review of the reference rates is necessary, and that the reforms following the investigations will have to be implemented in an internationally coordinated manner. The primary objectives are to eliminate the possibility of manipulation and to increase the transparency and accountability of the process in order to restore confidence in interbank interest rate quotes.

Of the international investigations conducted to date, the Wheatley Review concerning the LIBOR affair is summarised and the first steps of the BUBOR review are described below. Further reviews were initiated by the European Commission, the European Banking Authority (EBA), the European Securities and Markets Authority (ESMA) and the Bank for International Settlements (BIS). No information on the findings of these ongoing reviews has been published to date, but the objective of the reviews is basically similar to that of the LIBOR review; they raised the issues of the functions and methodology of reference rates as well as supervisory and regulatory issues related to them.

¹² In December 2011, the Citigroup and UBS were condemned for similar reasons by the financial supervisory authority in Japan. In their case, the punishment was less severe; they were only excluded from quoting for 1 and 2 weeks, respectively.

The Wheatley Review

The draft of the Wheatley Review aiming at the independent review and reform of the LIBOR quoting system was made available for public consultation in August 2012 (Wheatley Review, 2012a), in order to assess the money market role of LIBOR, explore the deficiencies of the current quoting system and identify alternative reference rates that are suitable for replacing LIBOR. The public consultation conducted with the involvement of the market makers and those concerned by the quotes was closed on 7 September, and the final report (Wheatley Review, 2012b) on the findings of the review was published on 28 September; it also defined a 10-point reform plan (see below).

An important conclusion of the review was that a comprehensive reform of LIBOR is necessary. However, LIBOR cannot be replaced in the near term or it would entail considerable financial stability risks.

Those who expressed their opinions during the consultation clearly argued for the continuation of LIBOR quotes, referring to the legal challenges of a change,¹³ to the international coordination difficulties stemming from the global role of LIBOR and to the lack of an alternative. In the future, the writers of the Wheatley Review intend to base LIBOR more on transaction data instead of expert judgement. However, there are clear market constraints to it over the short run.

The 10-point LIBOR reform plan of the Wheatley Review

1. **Introduction of statutory regulation** for mandatory submission, the selection of the persons of market makers (Approved Persons), civil and criminal sanctions as well as the provision of credible and independent supervision in the British Financial Services and Markets Act (2000) – as of 2013, if approved by the British legislator.
2. **Selection of a new administrator instead of the British Bankers' Association (BBA)¹⁴ to issue the reference rate**; it would be responsible for compiling and distributing the rate as well as for providing oversight. The new entity should be selected through a tender process to be run by an independent committee designated by the regulatory authorities.
3. In order to ensure transparency and non-discriminatory access to the benchmark, **the new administrator is responsible for** the surveillance, review, statistical examination and periodic monitoring of submissions so that LIBOR can meet market needs effectively and credibly.
4. **Expectation concerning the use of transaction data** in line with the submission guidelines of the Wheatley Review presented below. Based on their interbank experiences, submitters have to determine the submissions based upon the following hierarchy, primarily relying on transaction data:
 - **contributing banks' transactions in**
 - the unsecured interbank deposit market;
 - other unsecured deposit markets (CD, CP);
 - other markets (OIS, repurchase agreements, FX forwards, interest rate futures and options and central bank operations);
 - **contributing banks' observations of third-party transactions in the same markets;**
 - **quotes by third parties offered to contributing banks in the same markets;**
 - **expert judgement, in the absence of transaction data.**
5. **The new administrator is obliged to introduce a new code of conduct**, which includes guidelines for the use of transaction data, systems and controls for submitting firms, transaction record keeping responsibilities (submitting firm's name, communication with other partners, transaction data) and a requirement for regular external audit of submitting firms.
6. **Suspension of tenors and currencies.** The BBA is obliged to cease the compilation and publication of LIBOR for those tenors and currencies for which there are insufficient trade data. The changes must be implemented within 1 year. The Wheatley Review recommends the discontinuation of the AUD, CAD, DKK, NZD and SEK quotations as well as of the publication of LIBOR for the 4-, 5-, 7-, 8-, 10- and 11-month tenors. Continued publication of 1- and 2-week as well as 2- and 9-month

¹³ Changing the reference rate, which is widely used in private law contracts as well, is difficult.

¹⁴ British Bankers' Association, the organisation currently responsible for LIBOR quotations.

tenors would be re-considered. As a result, the number of LIBOR benchmarks published daily could be reduced from 150 to 20. Immediate consultation with the submitters on the issues of implementation should be launched.

7. **Publication of individual LIBOR submissions after 3 months**, to reduce the risks stemming from the stigma effect of quotations. (The stigma effect is described in the chapter entitled *Current international practice in the setting of reference rates* of this article.)
8. **Increasing the number of submitters**, if necessary through new powers of regulatory compulsion as well, in order to increase the representative character of the contributor panel.
9. **Encouragement of LIBOR users** to examine – in view of their economic objectives – whether LIBOR is the most appropriate benchmark in the given legal relationship or the use of alternative reference rates would be justified, and whether they should prepare for a possible ceasing of LIBOR quotations.
10. **Consultation with European and international authorities**. UK authorities should discuss the future of LIBOR as an international benchmark and the principles for effective global benchmarks in close cooperation with international institutions.

Questions of introducing alternative reference rates

The draft of the Wheatley Review contained a detailed list of the requirements that reference rates must meet (representativeness, coverage of the short end of the yield curve, being up-to-date, credit risk, standardisation, deep and liquid markets, long time series, interest in participation, etc.). Of the possible market segments suitable for producing an alternative reference rate (unsecured lending, treasury bills, repurchase agreements, interest rate on central bank instruments, CDs and CPs), in the draft of the Review mainly treasury bills and OIS (overnight indexed swap) markets were considered to be market segments that may serve as possible alternatives to the unsecured interbank market.

During the consultation, the OIS market¹⁵ was considered a possible reference rate by most of the participants. Credit

risk is much lower in the case of OIS transactions, thus interest rate quotes are lower. At the same time, for the pricing of interest rate derivative contracts, which are perhaps the most important of the financial contracts that refer to LIBOR, the reference rate does not need to contain the credit risk as well. In connection with this, it is worth to call attention to the amendments carried out in Denmark in September 2012: namely, for the pricing of mortgage loans the authorities recommended the use of an OIS type reference rate (CITA) instead of the interbank reference rate (CIBOR). In Denmark, the supervisory inspections in September 2012 excluded the possibility of manipulation, but at the same time they found it a serious deficiency that market quotations are not adequately confirmed due to lack of concrete transactions. The role of market maker will be taken over from the Danish Bankers Association by the Danish Financial Supervisory Authority, if the regulatory proposal receives the green light. In Denmark, there are actual transaction data behind the CITA, as opposed to the HUFONIA OIS swap, which is based on quotations.

First steps of the revision of BUBOR

Thematic investigation launched by the HFSA in September focuses on internal controls and BUBOR exposure

Reacting to the criticism related to the LIBOR quotations, the HFSA launched a thematic investigation of the BUBOR quotations on 10 September 2012. The thematic investigation is expected to take a few months.

BUBOR follows real market conditions, but does not forecast short-term central bank interest rate steps

Several empirical central bank analyses have been prepared on the BUBOR quotations in recent years. In 2009, at the Money Market Consultative Forum the MNB discussed its analysis related to the developments in the liquidity of interbank forint markets and in the information content of interbank reference rates with the liquidity managers of commercial banks. The analysis covered the turnover of various market segments and the comparison of their yields. In addition, due to the effects perceived in connection with BUBOR, the MNB also raised the possibility of a transacting obligation. (The discussion material for the Consultative Forum is available in Kuruc and Pintér, 2009; the minutes of the Forum are available in MNB, 2009.)

¹⁵ Detailed analysis of the international trends of OIS markets and of the forint-denominated HUFONIA swap market is provided in the study by Erhart and Kollarik (2011).

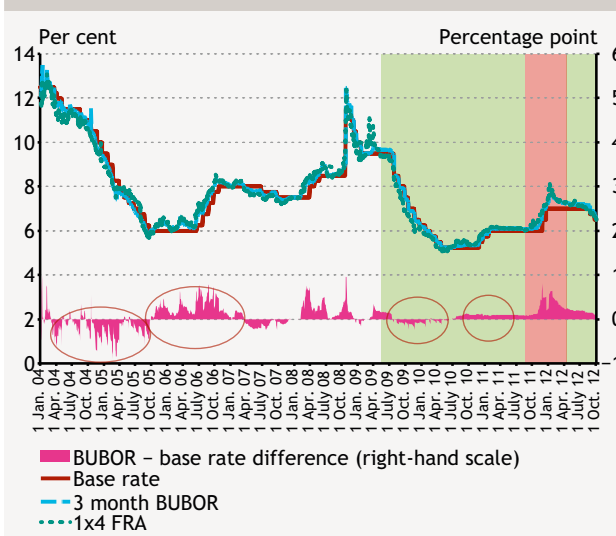
The article by Pintér and Pulai (2009) published in the MNB Bulletin compared the BUBOR quotations to other market yields, government securities market, swap and analyst expectations in relation to the quantification of market interest rate expectations. The analysis concluded that the result of the limited information content of BUBOR is that the yield curve estimated from the yield of interbank market instruments provides a more precise picture of expectations if the data of the BUBOR quotations are not used.

In addition to being strongly embedded in the pricing of financial products, BUBOR plays a key role in terms of market interest rate expectations as well. Therefore, the reliability of the quotation procedure of BUBOR and through that the undistortedness of the information content of BUBOR are important issues for the MNB in formulating the monetary policy as well.

Due to the peculiarities of domestic money market instruments,¹⁶ the use of BUBOR and the interest rate derivatives based on it has become the most accepted in the central bank practice of capturing short-term market interest rate expectations. Until December 2008, in addition to the effect of the counterparty and liquidity risk premium, BUBOR did contain market participants' expectation regarding the central bank base rate. During the cycle of interest rate cuts between 2004 and 2006, amid strong volatility, the spread between the 3-month BUBOR and the current base rate stayed in the negative domain, which was a good indicator of the expectation of a cycle of easing. Similarly, in the period of tightening that started in mid-2006 and during the preceding nearly three-quarter period of maintaining the base rate also mostly the expectations influenced interbank lending rates; this is shown by the strongly fluctuating positive BUBOR-base rate spread (Chart 3).

This period ended around the extraordinary interest rate increase that took place in the autumn of 2008, and as a result of the crisis – as well as the decline in liquidity and the elevated counterparty risk – the reliability of BUBOR in terms of short-term interest rate expectations declined considerably. Due to lack of a benchmark, submittals indicated participants' expectations to a decreasing degree. Following the turbulent period, BUBOR actually followed the changes in the base rate; the fluctuation in the BUBOR-base rate difference observed earlier shrank to a minimum. The disappearance of the interest rate expectations contained in BUBOR is spectacularly illustrated by the fact that starting from mid-2010 the spread between BUBOR and

Chart 3
Changes in the base rate and related financial market variables



the base rate became practically smooth; the constant minimum difference can be considered a kind of stuck liquidity risk (Chart 3, first green band).

The correlation observed since 2009 changed temporarily at end-2011, when BUBOR departed from the base rate in a spectacular manner. This period coincided with the cycle of interest rate hikes that started in early December; the elevated level of the BUBOR-base rate difference remained in place following the January maintenance as well (Chart 3, red and second green band). All of this showed that the information content of BUBOR had changed compared to the period that had lasted since 2009.

Following the two interest rate hikes of 50 basis points each and the turbulence in early January 2012, the 3-month BUBOR declined gradually, until finally the BUBOR-base rate difference became stable around 20-25 basis points at the beginning of April. This difference can rather be interpreted as a liquidity premium that consolidated at a higher than earlier level than the pricing of a new interest rate hike, as in this period other money market instruments (FRA, discount treasury bill) did not indicate any expected change in the interest rate environment.

The latest 'test' of the interest rate expectation information contained in BUBOR was around the time of the August and September interest rate cuts, when at the end of the summer the participants of the FRA market started to price monetary easing for the second half of the year, and the

¹⁶ In the discount treasury bill yields, the sovereign risk premium and the market liquidity premium hinder the reliable determination of interest rate expectations, while the OIS market is a relatively fresh segment in Hungary and trading therein cannot be considered active.

Table 5
Result of the OLS regression for the level of the 3-month BUBOR, where the explanatory variables are the first-order lag value of BUBOR and the also first-order lag of the change in the interest rate level

| Sample period | Dependent variable | Explanatory variables | | Estimation statistics | |
|----------------------------|--------------------|------------------------------|--------------------|-----------------------|--------------|
| | BUBOR (3 month) | BUBOR (3 month) (1st lagged) | Interest rate step | Modified R 2 | F statistics |
| November 2004–October 2008 | Coefficient | 0.996 | 0.111 | 0.998 | 0.00 |
| | P value | 0.000 | 0.000 | | |
| November 2008–October 2012 | Coefficient | 0.998 | 0.770 | 0.999 | 0.00 |
| | P value | 0.000 | 0.000 | | |

number of those who expected a cut increased among analysts as well. By contrast, practically no interest rate cut expectation was shown in BUBOR. BUBOR reacted to the interest rate cuts in August and September by immediate changes each time, as had been seen in the period between 2009 and 2011 (first green band). This is well illustrated by the fact that there was only a minimum change in the BUBOR-base rate difference, and it continued to include the constant premium.

Overall, BUBOR in itself still cannot be considered a suitable short-term market interest rate expectation indicator, and in recent months its behaviour has been similar to that between 2009 and 2011. Against this background, the extremely moderate decline in interest rate fixing makes it somewhat more difficult to interpret the FRA based on the reference rate, as it is not excluded that the declining quotations also reflect the interest rate expectations to a certain extent. It is also not excluded that this rather reflects an easing of the liquidity tension of the interbank market.

Quantitative analysis of the different BUBOR quoting practices of the two long periods presented above (preceding and following the 2008 global money market turbulence) also leads to a similar conclusion. The time series of the 3-month BUBOR shows strongly autoregressive properties; accordingly, an AR(1)¹⁷ process captures the changes in the level of the reference rate well. If the one-day lag of the change in the level of the central bank base rate is also included in the OLS¹⁸ regression, it can well be seen that in the period before October 2008 the variable takes a much lower coefficient than in the still ongoing period following the Lehman bankruptcy. All of this shows that in the pre-crisis period actual interest rate decisions had a much lower effect on the level of BUBOR than as of November 2008, i.e. the 3-month BUBOR priced the

expected interest rate steps to a greater extent. In Chart 3, in the hatched green periods, the extent of BUBOR fixing typically changed gradually on the basis of the interest rate decisions, i.e. the expectation effect was much less dominant (as indicated by the 0.77 coefficient of the interest rate step in Table 5).

Overall, our current study confirms the findings of earlier published analyses prepared by the Magyar Nemzeti Bank, according to which BUBOR quotations show the real market conditions as an average of longer periods. However, since 2009 – in the period of central bank rate cuts and hikes – their ability to provide a short-term forecast of interest rate steps has been limited.

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¹⁷ The AR(1) is an autoregressive process, where the time series is explained with its previous day value. In this case, $X_t = c + \lambda X_{t-1} + \varepsilon_t$, where X_t is the t^{th} observation, λ is the related coefficient, c is constant, ε_t is the error term of the equation.

¹⁸ The OLS (Ordinary Least-Squares Regression) is a linear regression method in which the sum of the squares of the error terms is minimised.

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Dániel Felcser: How should the central bank react to the VAT increase?

With a VAT increase, prices go up in the economy as businesses pass through the effects of the tax rise. Technically, this means that the consumer price index increases for one year; this is called the first-round effect. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the VAT hike to be persistent and future inflation to remain higher than it was before the VAT rise in the long term. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. According to the international best practice of central banks, monetary policy disregards the one-off price level increasing shocks, but attempts to offset second-round effects on inflation. However, in countries where the inflation target had not been met before the VAT rise, central banks are more inclined to also react to direct price level increasing measures, and risks relating to the anchoring of expectations are highly articulated in the communication of the central bank. As inflation in Hungary has persistently been above the target, there is a possibility that the recurring cost shocks may become incorporated into inflation expectations and may cause stronger second-round effects.

INTRODUCTION

These days, the central banks of developed countries and of a number of emerging countries set the maintenance of price stability as their primary objective. According to modern economic theory, monetary policy can most efficiently contribute to increasing welfare by ensuring the predictability of the economic environment, maintaining price stability and the stability of the financial system. Numerous central banks have chosen so-called flexible inflation targeting as the framework for this. Inflation targeting (IT) is a monetary policy strategy whereby the central bank strives to achieve its primary objective of price stability through a publicly announced inflation target. Under this regime, the central bank strives also to decrease economic volatility arising from different sources and reducing social welfare, exploiting the fact that inflation targeting provides it with a sufficiently flexible strategy. This is one of the reasons that at the international level IT has proven successful in curbing high inflation and anchoring expectations.¹

The maintenance of price stability is hindered by shocks to the economy, which may divert inflation from the desirable

level. The response of monetary policy depends on the causes underlying the change in inflation; consequently, the nature of the shock and the credibility of the commitment of the central bank to price stability need to be taken into consideration. If the shock has opposite effects on inflation and output (a so-called supply shock), then the short-term inflationary effect of the shock may be offset only at the cost of significant real economic sacrifices, and central banks try to achieve price stability in the medium term in such cases. If monetary policy is credible, the central bank has more leeway to refrain from offsetting swings which are considered to be temporary, because economic agents believe in the commitment of the central bank and expect inflation to subside later. Consequently, the temporary spike does not have any long-term effect on the pricing decisions of businesses. If, however, the expectations of economic agents are not completely rational or the inflation target of the central bank is not credible, there is a risk that agents will consider the additional inflation attributable to the one-off shock to be persistent and future inflation to be higher in the long term as well. In this case, the effect of the tax hike may also be present in the form of higher wages and expectations. This latter, indirect process is called the second-round effect. The second-round effect

¹ Inflation targeting had typically been a regime for small, open economies. However, early in 2012 two central banks of global significance, the Federal Reserve Bank of the U.S. and the Bank of Japan took additional steps towards inflation targeting (for more details, see Felcser and Lehmann, 2012).

may lead to a persistently higher inflation, which, all else being equal, may require a firmer monetary policy response.

A change in the rate of the value added tax (VAT), an indirect tax, can be considered as a special supply shock where the source, the timing and the initial size of the shock (the change in the tax rate) are easy to identify.² With a VAT raise, the price level increases in the economy as businesses pass through the effects of the tax rise, but as VAT is a consumption tax, it does not typically result in any additional effect through the cost structure of businesses.³ Technically, this means that the consumer price index increases for one year; this is called the first-round effect, while in 12 months' time the one-off price level increasing effect drops out of the annual price index. In the case of a one-off tax measure, the risk of a second-round effect may be lower than in the case of typical cost shocks (e.g. oil price increases). Therefore, if monetary policy is credible, the central bank can typically dispense with offsetting the inflationary effect of a VAT increase. If, however, the consumption tax rates are changed frequently, the aforementioned second-round effect is more likely to appear, which may require a monetary policy response.

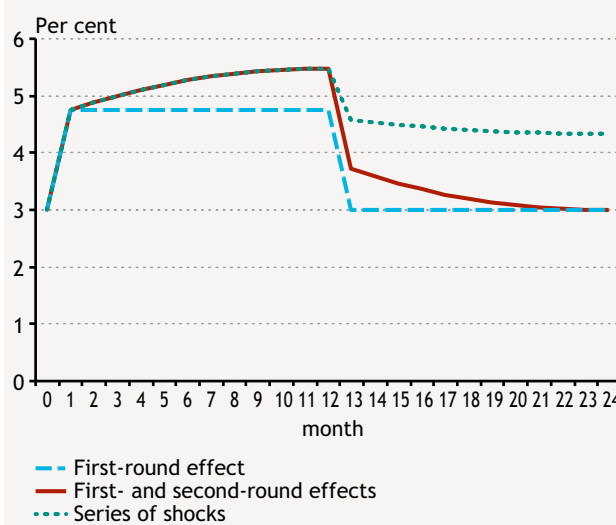
In the following, we use various scenarios to present the potential effects of a VAT rate increase, and then go on to survey international experiences. Finally, we discuss the characteristics of the current Hungarian situation.

THE GOOD, THE BAD AND THE UGLY

The VAT increase may cause the price index to rise significantly while the inflation rate adjusted for the direct effect of the tax change remains moderate, which poses a challenge to the central bank both from a monetary policy and communication standpoint. As mentioned earlier, the monetary response essentially depends on the inflationary effects of the VAT increase. To illustrate this point, we first present two cases in the one-off VAT increase scenario, depending on whether the shock has any second-round

Chart 1
Inflation scenarios after a VAT increase

(YoY indices)



effect. In our example, the VAT rise caused a close to two percentage point increase in inflation in the initial period, as the effect of the tax change is immediately built into prices (Chart 1).⁴ We assume that before the VAT shock the inflation target of the central bank had been met and no other inflation shock is affecting the economy, that is, the central bank faces only the inflationary effects of the VAT hike. Then we examine what additional risks arise if the economy is subjected to a series of shocks, instead of a one-off occurrence.

In the first case, the VAT increase has only first-round effect: the prices of the products affected rise and remain at the higher level persistently, while inflation falls to the inflation target of the central bank after a year, provided that expectations are anchored, as soon as the effect of the tax increase drops out of the annual price index. Economic agents consider the deviation of inflation from the target to be temporary and align their pricing and wage decisions to the medium-term target. Central banks do not tend to offset

² Other price shocks may also result from government measures, but in this article we concentrate on VAT increases due to their aforementioned features and because of the fact that inflation targeting central banks (IT central banks) examined typically refer to this factor in their communication.

³ Increases of the rates of taxes on consumption directly increase the price of the part of the consumer basket subject to the tax change and they may also indirectly affect consumer prices (for instance, through their effect on aggregate demand). Thus, when households bring forward some of their consumption before a VAT hike to make use of the lower tax rate, the one-off increase in demand may also result in higher price levels. We should note that according to the results Gábríel and Reiff (2006) obtained for Hungary, the effects of VAT increase and VAT decrease are not symmetrical. We concentrate on VAT increases in the following.

⁴ In the example we disregard the possibility that businesses may incorporate the VAT increase in their prices in advance, in the period between the announcement and implementation of the VAT increase depending, inter alia, on the cost of the price change and the level of competition on the market. This happened at the time of the VAT hikes of 2007 and 2012 in the Czech Republic when, according to the Czech central bank, more than half of the short-term effects appeared in prices in the 2-3 months preceding the tax rise (CNB, 2012). In respect of Hungary, a previous study found no signs of that happening (Gábríel and Reiff, 2006). Furthermore, the short-term effect of the VAT increase may actually exceed the longer-term increase in the price level as shops may implement some price increases originally proposed for later simultaneously with the price rise caused by the VAT hike.

such temporary inflation shocks. An argument for this approach is the temporary nature of the direct inflationary effect of the shock: by the time the monetary policy measure could have an effect, the shock has already unwound, while monetary tightening would raise the risk of undershooting the inflation target. An argument against this approach is the possibility that – as a result of the higher-than-targeted inflation – the anchoring of expectations may weaken and second-round effects may emerge after a while. That is, the stronger the medium-term anchoring of expectations and the credibility of monetary policy is assumed to be, the more the central bank can afford to forego offsetting the primary inflationary effect of the shock.

In the second, less favourable scenario, the one-off price increase is accompanied by second-round effects. While the central bank may decide not to offset the direct effects of the VAT shock on inflation, the presence of second-round effects may necessitate monetary policy action. The second-round effect is closely related to the inflation expectations of economic agents. If businesses expect inflation to persistently be above the target, they may increase their prices more than they would otherwise. If employees expect inflation to be persistently above the target, they will put forward higher nominal wage increase demands to maintain the purchasing power of their income. Businesses may be prompted to increase their prices to be able to finance wage increases. Meanwhile, higher income and the resulting higher consumption also generate inflationary pressure. Consequently, the increase of expectations for future inflation may affect the pricing and wage decisions of economic agents; inflation on the whole rises at a higher rate and more persistently than in the first scenario and, all else being equal, more monetary tightening may be required to curb inflation.

The situation is aggravated if instead of a one-off shock, a series of VAT rises keep inflation high, increasing the risk of second-round effects. One-off price level increasing shocks are generally considered to be relatively rare events; in such a scenario, the probability of cost shocks diverting inflation from the central bank target is the same as the probability of downward shocks (shocks are symmetrical), therefore, they are not expected to feed into the expectations of economic agents. If, however, consumption tax rates are changed frequently, there is an increased risk that economic agents will not think of such government measures as rare shocks with zero effect on average, and second-round effects will follow. Therefore, monetary policy may not necessarily be in the position to refrain from offsetting the VAT shocks if they are frequent and point in the same direction – for instance due to a rearrangement between direct and indirect taxes.

Consequently, the optimal monetary policy response to a VAT rise depends on the level of trust of monetary policymakers in the anchoring of inflation expectations. Typically, surveys are used to attempt to quantify inflation expectations, but due to various measurement difficulties reliable indicators are hard to generate.⁵ In general, the more a shock can be considered temporary and the less second-round effects are to be feared, the less monetary policy needs to respond.

INTERNATIONAL EXPERIENCE

During the crisis, VAT rates (mostly the standard rate) have been increased in several countries where the central bank follows inflation targeting. In most cases, the tax increase resulted in above-target inflation, as the price increases kept the price index high for 12 months. As we

Table 1
Selected VAT rate increases in recent years

| Country | Date of raise | Extent of raise | Monetary policy response |
|----------------|----------------|---|--|
| Czech Republic | 1 January 2010 | 1 percentage point <i>(general)</i> | Risk of second-round effects was deemed insignificant, no interest rate increase followed. |
| | 1 January 2012 | 4 percentage points <i>(reduced rate)</i> | |
| United Kingdom | 1 January 2010 | 2.5 percentage points <i>(standard rate)</i> | Expectation risk became a recurring element in communication. |
| | 4 January 2011 | 2.5 percentage points <i>(standard rate)</i> | |
| Romania | 1 July 2010 | 5 percentage points <i>(standard rate)</i> | Ongoing easing cycle came to a halt. |
| Poland | 1 January 2011 | 1-2 percentage points <i>(various rates)</i> | One of the reasons for tightening. |

⁵ For example, the expectations of households may be distorted by the tendency of households to assign a greater weight to products purchased more frequently, such as food and petrol.

saw above, central banks tend to focus on the risk of second-round effects rather than the temporary spike in inflation. However, the responses of central banks may cover a broad spectrum. To illustrate this, we looked at the monetary responses to six VAT increases of recent years by regional central banks and the Bank of England (Table 1).

The Czech central bank did not respond to VAT increases, considering the risk of second-round effects to be insignificant both in 2010 and 2012. In 2010, the inflation forecast showed inflation increasing slightly in the short term, whereas on the horizon of monetary policy the target was reached and inflation adjusted for the effects of tax changes approached the target from below. Whereas in January Czech policymakers unanimously decided to keep the interest rate unchanged, in February, as a result of inflation being lower than expected (partly for methodological reasons) they saw a downward inflation risk and a rate cut was also considered in the Board. At the time of the VAT increase of 2012, the price index was expected to temporarily rise above 3 per cent, which significantly exceeded the 2 per cent target of the Česká národní banka (Czech National Bank), but the price index is expected to fall early in 2013. Inflation adjusted for tax effects is forecast to be around the target throughout the horizon. The Board perceived an upward inflation risk in the development of food prices; on the whole, their assessment of the risks was balanced. The potential second-round effects in inflation expectations and wages were deemed insignificant, which was confirmed by anecdotal evidence and the development of expectations. In the alternative scenario of their inflation report in May they reckoned with more VAT increase to come, but based on past experience and the subdued economic climate, they still did not expect any significant second-round effects.

In the case of the VAT hike of the UK early in 2010 (which was a re-raise of the rate after the VAT rate cut at end-2008), there were signs indicating that the pass-through of the VAT hike may be somewhat greater than previously expected. Moreover, the fuel price rise also increased inflation. If inflation remains persistently above the target for years, expectations may also increase – but on the whole the Bank of England saw little evidence that the inflation expectations of households or of money market participants had changed significantly in the second half of 2009. In addition to the disciplinary power of unused capacities on pricing, the forecasts for the period when the effects of the weakening exchange rate and the VAT increase would end indicated that inflation would fall below the target. Consequently, no monetary tightening was deemed necessary.

Early in 2011 inflation was considerably above the target due to the repeated increase of the standard VAT rate and the higher energy and import prices. According to the Board, medium-term inflation risks had also risen (Bank of England, 2011). The central bank emphasised that in such an environment it was particularly important how much economic agents relied on past inflation when formulating their expectations and how long they envisage the horizon over which the Bank of England can meet its target again. In its communication, the Bank of England emphasised the risk of second-round effects repeatedly in view of the inflation being persistently above target. The inflation expectations of households started increasing in previous months whereas the expectations of businesses, and expectations derived from money market prices and wage growth remained stable. Eventually, the VAT rate hike dropped out of the basis early in 2012, the incoming data indicated a significant decline in inflation, which reduced the expectation risk.

The above cases share the common element that inflation expectations can be assumed to be anchored in both countries. Where the inflation target had been met on average for a longer period, second-round effects gave less cause for concern and the central bank 'looked through' the one-off spike in inflation. However, in countries where the inflation target had not been achieved, central banks were more inclined to also react to direct price level increasing measures, and thus the tax change had an impact on their interest rate decisions.

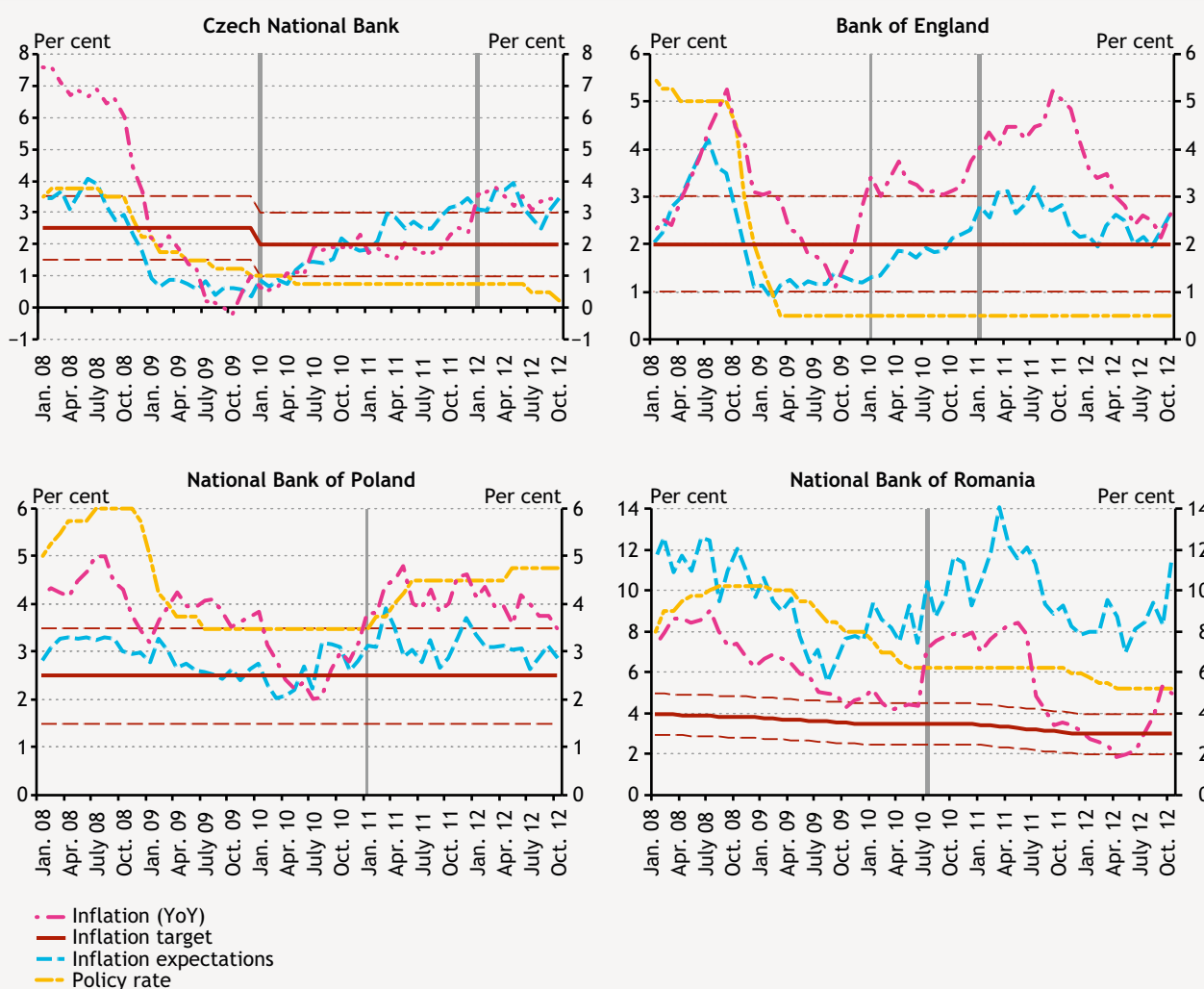
One such central bank is the Banca Națională a României (National Bank of Romania), whose decision making body, at its meeting at the end of June 2010, abandoned the interest rate cut cycle started at the beginning of the year, in the course of which it had reduced the base rate by 175 basis points in total. The decision was motivated mainly by the expected rise in inflation as a result of the VAT increase and the need to anchor expectations so that the appearance of second-round effects in consumer prices can be avoided. Against the backdrop of a significant, but temporary spike in inflation, the central bank continuously emphasised during the summer that it was striving to mitigate second-round effects and anchor inflation expectations at a low level. Taking into account the inflation reducing effect of the negative output gap, decreasing inflation towards the target was expected for the end of 2011, after the first-round effect of the tax change drops out of the price index. In the medium term, however, they called attention to the risk of second-round effects through rising expectations. The risk remained despite the inflation figure in September being slightly less than expected, while the base rate was not modified again during 2010. The first-round effect of

the VAT rise petered out in one year; as a result, inflation had subsided to 3.5 per cent, which is close to the target, by September 2011. After this, the Board embarked on another interest rate cut cycle in November.

In the case of the Narodowy Bank Polski (National Bank of Poland), the motives underlying the rate increase may have included fears of rising inflation expectations. The rise in the inflation rate in Poland early in 2011 was attributable mainly to the VAT rate increase, the global rise in agricultural commodity prices and oil prices as well as an increase in regulated prices. Parallel with the inflation rate, core inflation and the inflation expectations of households also rose. The Board decided on a 25-basis point base rate increase in January already, citing inflation risks. Because of rising inflation, there was a risk that expectations would be stuck at a higher level, which would call for further

monetary tightening. At its next meeting in early March, the Board did not see such a measure justified: in its assessment, the interest rate increase of January in combination with the subdued economic climate, the moderate wage pressure of businesses and rising unemployment had sufficiently reduced the inflation risks. In April, however, it was already evident that core inflation and expectations had both continued rising, and the incoming real economic data showed that increasing inflation pressure was to be expected from the demand side. Consequently, the Board decided to continue monetary tightening to mitigate the risk of inflation being above the target in the medium term. The tightening cycle started in response to the rising inflation may have also played a part in the current anchoring of expectations. More firmly anchored expectations also mean that the latest rate cut may incur less inflation risk.

Chart 2
Inflation, expectations and the policy rate in the countries analysed



Note: The vertical lines indicate the VAT rate increases analysed. The broken lines indicate the tolerance interval around the inflation target. Inflation expectations quantified from the survey of the European Commission, based on Gábel (2010).
Sources: IFS, MNB, central banks and national statistical offices.

It is notable in the inflation history of the countries analysed that they typically considered firmer monetary policy responses necessary in cases where the inflation target had not been met in the prior period and consequently there was a higher risk of increasing inflation expectations (Chart 2). In contrast, where the target had been met, there was more confidence in the anchoring of expectations, and thus there was less fear of second-round effects.

OVERVIEW OF THE SITUATION IN HUNGARY

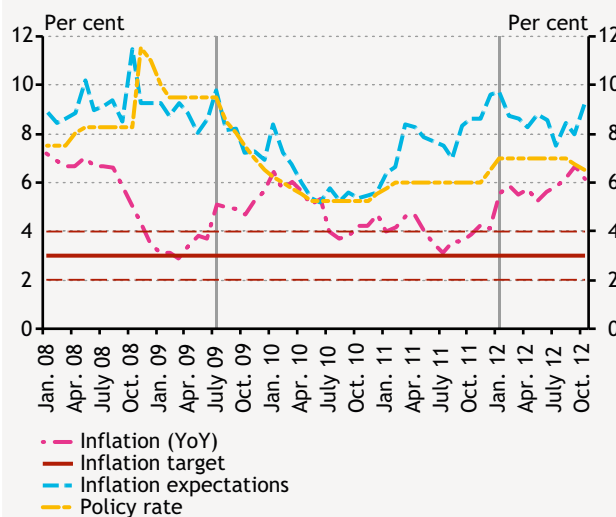
Inflation in Hungary has been significantly above target for a considerable length of time. Since the introduction of the continuous inflation target early in 2007, inflation has been above 5 per cent on average. The so-called constant tax rate index calculated by the Hungarian Central Statistical Office (HCSO) to filter out the immediate direct effect of changes in indirect taxes was approximately 1 percentage point lower on average during the period but it was still above the 3 per cent target. According to policymakers, when assessing the achievement of the inflation target, fluctuations resulting from unexpected effects must also be taken into consideration, and therefore a consumer price index departing from the 3 per cent target by no more than ± 1 percentage point is acceptable *ex post* for purposes of price stability. However, inflation was above the 4 per cent ceiling thus calculated in three quarters of the period. In the case of the constant tax rate index, this ratio is below 40 per cent, which is still not negligible and shows the importance of indirect tax rises in the development of inflation.

Inflation remaining persistently above target may endanger the anchoring of expectations. This risk arises because economic agents, perceiving inflation to significantly exceed the target of the central bank, may conclude that the central bank is more tolerant of short-term deviations in inflation or doubts may arise concerning the commitment of the central bank or its ability to bring inflation back to target in the medium term (Macallan et al., 2011). This may cause their inflation expectations to rise, which in turn will be reflected in their pricing and wage decisions. The more credible the central bank is, that is, the longer the period that it was able to maintain price stability, the less likely the above risk is to materialise.

International experience also shows that persistent deviation from the target raises inflation expectations, which start declining only when inflation is back around the target again (Corder and Eckloff, 2011). Research findings indicate that short and medium-term inflation expectations are slower to shift than inflation itself, and they gradually

return to their previous level once inflation is back on target. However, the return of (medium-term) expectation takes time. In half the cases investigated, where inflation was persistently off-target, inflation deviated from the inflation target for 9 quarters at the most – the Hungarian figure is significantly higher than that. This also seems to indicate that in Hungary there is a considerable risk that

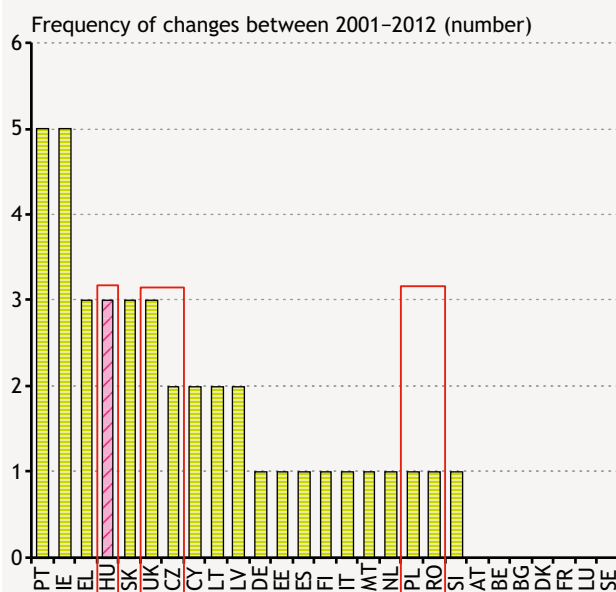
Chart 3
Inflation, expectations and the policy rate in Hungary



Note: The vertical lines indicate the VAT rate increases analysed. The broken lines indicate the *ex post* tolerance interval around the inflation target. Inflation expectations quantified from the survey of the European Commission, based on Gábel (2010).

Sources: IFS, MNB.

Chart 4
Frequency of changes to the standard VAT rate in EU Member States between 2001 and 2012



Note: The countries analysed are highlighted.

Source: European Commission.

inflation expectations are not anchored, as in the past 5 years monetary policy has been unable to stabilise inflation for a longer period around the 3 per cent target (Chart 3). This is also suggested by the results of Gábrriel (2010), to the effect that in Hungary expectation shocks have played an important part in explaining the volatility of inflation and the development of inflation and wages. Accordingly, the inflation target of the central bank probably fails to sufficiently coordinate the expectations of economic agents; therefore, there is greater probability of temporary inflation shocks having second-round effects.

High inflation is partly attributable to frequent and substantial cost shocks: in recent years food and oil price increases and tax measures with inflationary effects have come one after the other. The changes in the Hungarian VAT rates would be considered frequent by international standards, and thus the outstanding volatility of the standard tax rate did not contribute to a predictable economic environment and the evolution of firmly anchored inflation expectations (Chart 4). Accordingly, there is a risk that of the scenarios described above, the one containing a series of shocks will materialise.

CONCLUSIONS

The illustrative scenarios and international experience outline the typical response of central banks to VAT increases: where inflation expectations are anchored, it may be assumed that government measures directly increasing price levels have no persistent effect on inflation, and monetary policy does not respond to them, while it does offset any second-round effects appearing in wages and expectations. The international best practice of central banks relies on the assumption that price level increasing shocks are relatively rare and symmetrical. This assumption is the reason that central banks may be justified in thinking that such shocks are not built into the inflation expectations

of economic agents. In the case of Hungary, however, there are arguments that the risk of second-round effects is greater. On the one hand, based on the persistently above-target inflation and survey results, the anchoring of inflation expectations around the target is questionable. On the other hand, in recent years economic agents may have become accustomed to the rearrangement of Hungarian consumption tax rates; therefore, it may be reasonable that they do not think of the government's price increasing measures as rare shocks with zero average effect.

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Ádám Martonosi: Factors underlying low investment in Hungary

Since the onset of the economic crisis, an unprecedented downturn in investment in the national economy has occurred in the past four years. This marked decline has been registered in all sectors of the economy, albeit to differing degrees. Investment is a key aspect of convergence for the Hungarian economy as the renewal and expansion of the capital stock determines the magnitude of production capacities, and through that, economic output. The lack of investment by the government sector and households mainly reduces gross domestic product in the short term, while the decline in corporate investment not only directly reduces aggregate demand, it also has a negative impact on Hungary's potential growth in the medium and long term.

Our analysis examines the development of investment in a regional comparison, in a breakdown by sectors, starting from the pre-crisis years and primarily focusing on the period of the crisis.

In a regional comparison, investment trends in Hungary were already moving in the wrong direction before the crisis, with the investment ratio gradually declining as a percentage of GDP. The adjustment of 2006 considerably reduced government expenditures, and simultaneously the less favourable demand conditions resulted in a general drop in corporate investment. As a combined result of the above, at the onset of the crisis Hungary had the lowest investment rate in the region. After 2008, the combination of the major economic slowdown, the persistently weaker demand prospects, the substantial balance sheet adjustment requirement for the public and private sectors alike and the marked downturn in the lending activity of banks caused a substantial decline in investment. In Hungary, the decrease in accumulation by households has been significant in international comparison, while the government's investment ratio has remained stable in recent years, mostly as a result of the accelerated use of EU funds. The drop in corporate investment proved to be substantial primarily in sectors producing for the domestic market and in the service sectors, while investment by companies producing for exports was boosted considerably by large projects in the manufacturing industry. As a result, the investment situation is more favourable in this segment.

INTRODUCTION

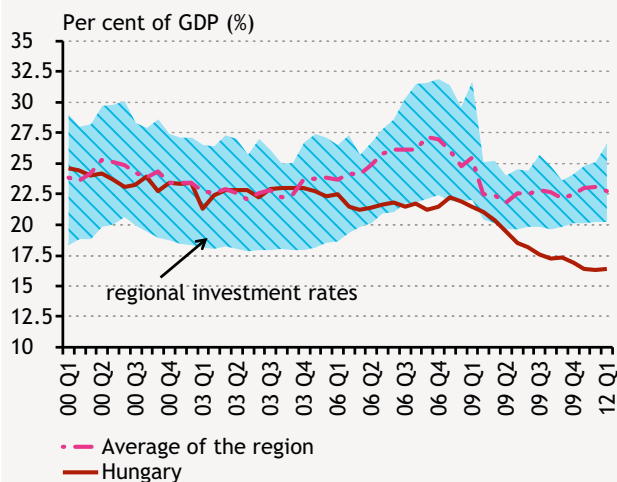
Whole-economy investment is of outstanding importance for several reasons. On the one hand, 20 to 25 per cent of aggregate demand is generated by investment projects in the region, and thus they make a significant contribution to GDP in the short term. On the other hand, investment allows the domestic capital stock to expand and renew. The potential growth of the economy is determined by the combination of the available labour force, the volume of physical capital¹ and the efficiency of their combined use. Consequently, on the supply side of the economy, investment is the basis of growth mainly in the medium and long term.

This is why it is important to understand the processes underlying the investment activity of recent years, the channels through which the crisis exerted its adverse effects, the factors that have determined and will continue to determine the investment-related decisions of economic agents and the probable duration of this negative trend.

The dynamic investment growth seen in Hungary in the 2000s came to a halt by the middle of the past decade (Chart 1). In the two years following the 2006 fiscal consolidation, the decelerating economic growth was supported only by the subdued growth in investment. After the outbreak of the global economic crisis, however,

¹ The level of the capital stock is affected not only by investment but also by depreciation. In this paper, we focus on understanding the investment processes.

Chart 1
Investment rates in a regional comparison



Source: Eurostat.

investment in the national economy plummeted to depths unseen since 1995: from 2009 Q1 we witnessed a marked decline across the board, in every segment of the economy. The rate of decline in Hungary has been dramatic in international comparison as well, and we are in a worse position than our neighbours in the region.

In this paper, we investigate how investment activity changed before and during the crisis in a regional comparison, primarily based on an analysis of the countries of the region. First, we identify the channels important for investment through which the crisis hit the various sectors and economic agents, and subsequently we present where and to what extent the process of adjustment caused persistent, trend-like decline or only a temporary, cyclical downturn.

INVESTMENT DURING THE CRISIS

In period of recession, investment generally shows a pro-cyclical behaviour:² the decline in aggregate demand moves in parallel with a substantial decrease in capital formation. In addition to the cyclical decline typical of recessionary periods, long-term factors may result in a decline in underlying investment developments. The persistent deterioration in the growth outlook may foreshadow a more marked adjustment than previously seen.

The cyclical downturn is first noticeable in a contraction in aggregate demand and deterioration in the income position

of households. Against the backdrop of increasing unemployment and declining real wages, households first cut back on their investment while they try to smooth their consumption using their savings. If the recession is also coupled with a major downswing in the housing market, the decrease in housing prices points to a decline in households' investment activity, partly through the fall in the value of the collateral that can be used for credit and partly through the decline in bank portfolio quality and thus through a tightening in mortgage lending as well.

In the case of corporations, the contraction in global demand is first reflected in deteriorating corporate profits, which businesses offset by reducing production and inventories. Weaker output is coupled with a drop in inputs used for production, including moderation of wages and a decline in the workforce on the human capital side, and a reduction in the utilisation of production capacities on the productive capital side. In the event of a temporary, cyclical economic decline, enterprises do not tend to cut back on their capital stock, with the exception of firms which were already in a poor profitability position before the crisis. On the other hand, investment is reduced as lower capacity utilisation means less depreciation and thus lower additional investment requirement and consequently capacity expansions may also be postponed.

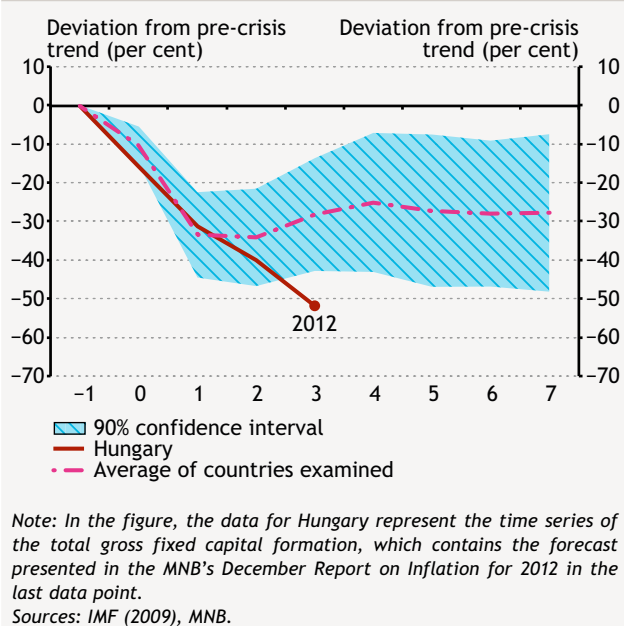
In the event of a cyclical economic downturn, fiscal investment may be influenced by different considerations. In countries that pursued disciplined fiscal policies prior to the crisis there is more room for manoeuvre to pursue a looser fiscal policy. Budget measures may partially offset weakening private sector demand by stimulating aggregate demand. We have seen examples among countries with more favourable initial debt stock, for instance the car scrapping programme in Germany, and in our region, government investment has increased as a percentage of GDP since 2008 in Slovakia and in Poland³ as well. During the crisis, many countries were unable to take this route because the level of public debt proved to be an integral part of the problem, and thus the fiscal authorities themselves were forced to implement fiscal consolidation measures including cutbacks in government investment projects.

Based on the experience of the IMF with financial crises (Chart 2), investment falls for two years after the onset of the crisis, and then – following stabilisation – it grows at rates similar to the pre-crisis period. Looking at the

² In the case of the region and converging countries, this is coupled with significant volatility (Benczúr and Rátvai, 2005).

³ In the case of Poland, investment growth was driven by infrastructure projects for the European Football Championship in 2012.

Chart 2
Investment during financial crises
 (Hungarian investment is shown for 2008–2012)



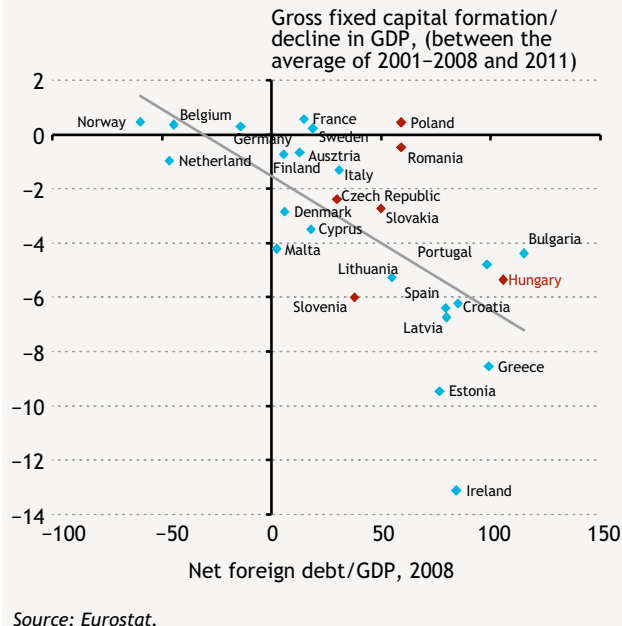
Hungarian data, two important differences can be observed: first, in the case of domestic investment the deviation from the pre-crisis trend is greater than what is experienced internationally; second, no turning point is seen in the domestic data for the time being.

In many European countries, the excessive indebtedness of the government and/or the private sector proved to be one of the main causes of the problems, which may suggest not only a cyclical downturn in investment but may foreshadow a trend-like decline in investment due to the protracted balance sheet adjustment of the various actors. In the following, we present the causes that may suggest a persistent downturn in investment.

The overspending of prior years/decades led to high public or private debt in a number of countries, and fears concerning their repayment mounted gradually after 2008. Faster adjustment was observed in the countries where the debt-to-GDP ratio was higher, and thus the decline in investment was more significant (Chart 3).

The general weakening of confidence rendered the refinancing of existing debt more expensive if not impossible for the states, while the strengthening coordination within the European Union imposed much more severe requirements for the consolidation of public finances. The European Central Bank attempted to remedy the financing problems of distressed countries by various means, and several countries are still using these facilities. Nevertheless,

Chart 3
Relationship of debt and investment in international comparison



seriously indebted countries face higher financing costs than prior to the crisis. Against that backdrop, the countries that implemented fiscal consolidation became part of the investment problem themselves, as the persistent decline in the level of government investment may reduce the investment rate in the long term.

The level of household indebtedness has played a similarly important role in the investment activity of recent years. Mortgage loans, which were available at low interest rates before the crisis, resulted in a rapid growth in housing investment in a number of European countries and contributed to the development of a real estate market bubble in several cases (Spain, Ireland). In most countries, the tightening of credit conditions, the deterioration in the income position and the bursting of the housing price bubble resulted in a substantial drop in the output of the construction industry, and investment shrank to a fraction of their previous levels. Although no real estate market bubble developed in Hungary, a rapid increase in households' mortgage-backed indebtedness mostly denominated in foreign currency was typical here as well. The balance sheet adjustment of households due to the accumulated debts has been ongoing in these countries since the onset of the crisis, but its rate is slow and – compared to the rate seen in the pre-crisis period – it will result in a lower investment rate in the long term.

The magnitude of indebtedness represented a less significant problem in the corporate sector: compared to the other

two sectors, the balance sheet adjustment requirement was lower in connection with the reduction of debts. Accordingly, cyclical channels may have limited corporate investment activity more strongly here.

Alongside with and in close relationship to the debt, another important consideration is the issue of financing. Investment is typically implemented with a high proportion of credit, but the negative impacts of the crisis on the financial system made it difficult if not impossible to obtain funding, and funding costs rose significantly. The lending capacity of banks and other credit institutions weakened as the losses suffered on their loan portfolios and the negative revaluation of the remaining portfolio significantly worsened the balance sheets of banks. The contraction of funding sources and banks' declining risk tolerance still represent severe constraints to private sector entities, which therefore cut back on their investment. Governments find it easier to obtain financing than private sector entities. Most countries are still able to raise funding in the government bond markets, albeit at elevated interest rates, and where this becomes temporarily or permanently impossible, the credit facilities of international organisations offer a solution. In Europe, the EU's development funds may present additional sources of financing for converging countries including Hungary. Most of these funds are provided to the various countries for investment purposes, and they can mitigate the financing difficulties of the public and private sectors alike, due to their low own funding requirement. On the whole, however, the lending capacity of the financial system has weakened compared to the pre-crisis era, which may persistently reduce investment activity in both the corporate and household sectors.

The third element of the stubborn investment problem is the issue of forward-looking expectations relating to the economic situation. In Europe, the public and private sectors struggling to reduce the debt are only able to stimulate the supply side of the economy at a very slow pace, which in turn elevates the financing constraints in place on the side of the financial system. Furthermore, the profitability of businesses is undermined by the corporate tax burdens increased in the course of crisis management, while the frequent changes in the regulatory environment reduce predictability and risk tolerance. In combination, these factors create an uncertain business environment for the corporate sector, which may lead to a permanent backlog in investment by companies producing for the domestic market or providing services. Enterprises producing for exports are in a better position, as other actors in the global economy, particularly Asia, have generated significant demand even during the crisis, but risks relating to a global slowdown point to more restrained

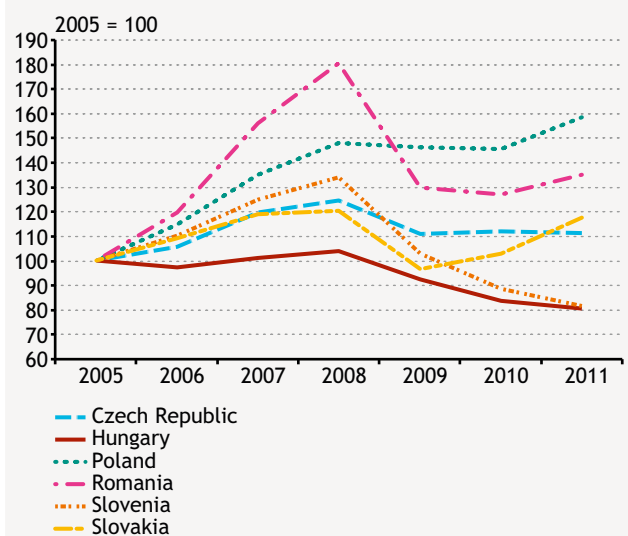
investment activity in the case of exporting companies as well, and other risks (funding, taxation, regulatory changes) also affect enterprises producing for external markets.

INVESTMENT TRENDS IN HUNGARY AND THE REGION

The level of economic development of Hungary and other countries in the region is below the EU average. The lower per capita capital stock and lower average wage level typical in converging countries promise a higher return to investors, and thus the capital stock may grow faster than in developed countries. However, the outbreak of the economic crisis reduced the speed of convergence, and the investment rate declined considerably in all countries of the region. In the following, we attempt to identify the differences and similarities in the investment trends of Hungary and its regional peers.

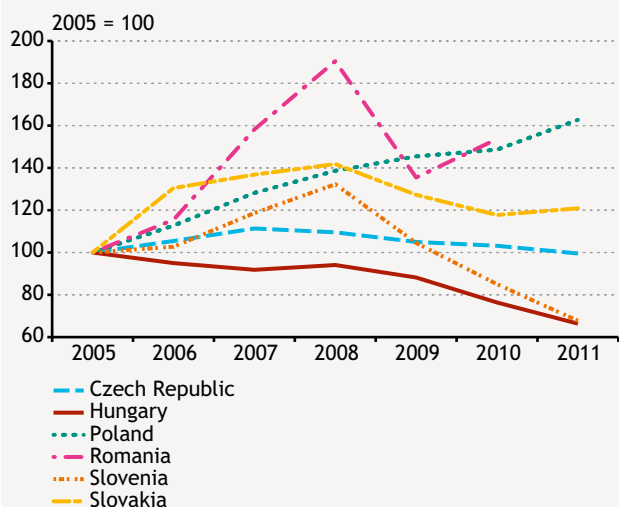
In international comparison, the investment-to-GDP ratio can be used to compare the proportion of gross domestic product each country uses to renew or expand its capital stock. Of the countries in the region, only Poland and Romania had lower investment ratios in the first half of the 2000s than Hungary. However, in the pre-crisis years Hungary was already below the regional average, and at the onset of the crisis the difference was 4-5 percentage points compared to its better positioned regional neighbours (Chart 1). We should note that prior to the crisis the fiscal consolidation of 2006 in itself reduced the Hungarian investment rate by one percentage point and in the subsequent two years we only saw stagnation, while

Chart 4
Changes in investment



Source: Eurostat, national statistical offices.

Chart 5
Building-type investment



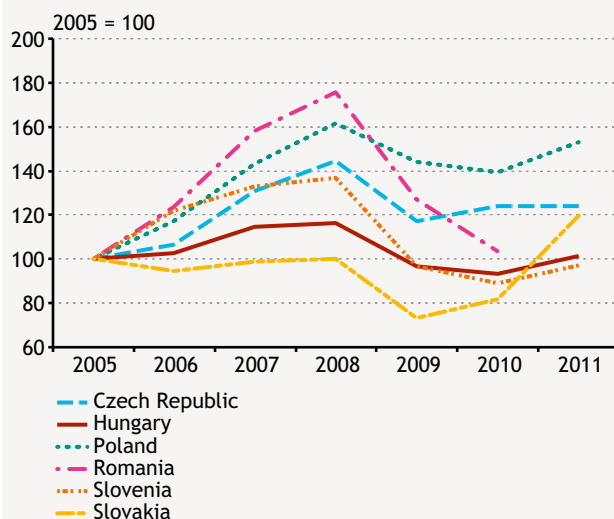
Source: Eurostat, national statistical offices.

investment expenditure as a percentage of GDP continued to increase in almost every neighbouring country until 2008. Investment plummeted everywhere in 2009. In the period since 2010, the investment rate has stagnated or increased in the majority of the countries of the region, while compared to 2005, investment activity in Hungary in 2011 was some 20 per cent lower, which is the lowest figure in the region, together with Slovenia.

In its own right, the investment rate being lower than that of our neighbours in the region for an extended period of time may indicate a persistent investment problem; the question is which economic segment is responsible for this deficiency. Looking at the breakdown of investment by material-technical content,⁴ a strong duality is seen, which may indicate differences in behaviour across the various sectors of the economy (government, households, businesses).

The growth of building investment has been very heterogeneous in the region since the onset of the crisis (Chart 5). Hungary's performance is among the poorest, a similar decline is found only in Slovenia, where this process happened faster and more drastically in recent years. In the case of machinery investment, after the decline of 2009, signs of slow stabilisation are seen in Hungary, the Czech Republic, Poland and Slovenia, while Slovakia expanded its capacities dynamically. Machinery investment in Hungary is at its 2005 level. All of this indicates that the investment

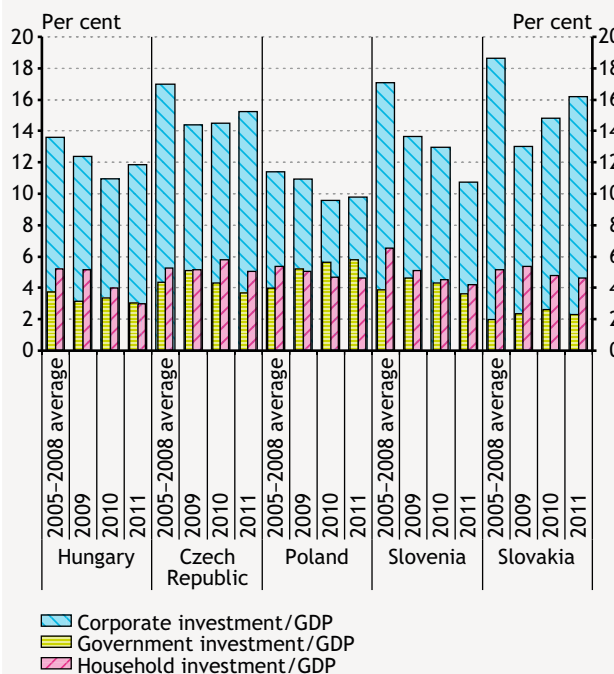
Chart 6
Machinery-type investment



Source: Eurostat, national statistical offices.

performance of Hungarian companies was already lower before the crisis, whereas during the crisis the dynamics observed in terms of corporate investment did not deviate from the regional average.

Chart 7
Sectoral investment trends in regional comparison



Source: Eurostat, national statistical offices.

⁴ Two large groups of investment are building-type and machinery-type investment, covering 95–98 per cent of investment activity as a whole. In terms of sectors, the government and households tend to implement mostly building-type investment while the capital expenditures of businesses are mostly in machinery and equipment.

Moving on to the detailed analysis of the various sectors, the Czech Republic and Slovenia led the way in government expenditure reductions following the outbreak of the crisis, with the ratio of government investment falling by one-fifth as a percentage of GDP. The rate of government expenditures did not change materially in Hungary and Romania; it should be noted, however, that Hungary had already implemented a fiscal consolidation round between 2006 and 2008, whereby investment expenditures fell by one-third as a percentage of GDP. By contrast, Poland and Slovakia increased their government investment to GDP ratio significantly despite the crisis, expanding their expenditures by one-fifth in three years on average.

In Hungary, the government sector is responsible for 15–20 per cent of whole-economy investment. Government-related investment covers a broad range: in addition to

direct public involvement (central agencies, local governments, state-owned enterprises), investment involving the public sector is also present in the business sector (public utilities, quasi-fiscal institutions, PPP projects, EU projects). In general, the largest share of capital formation of the government consists of infrastructure projects, which had been a major addition to investment in Hungary before the crisis. In the course of the fiscal consolidation of 2006, the investment rate of the government declined significantly, mostly due to the lack of the previously significant infrastructure projects. During the crisis, expenditure cuts meant reducing investment in all areas of the government sector; still, the government investment rate as a percentage of GDP did not decrease as compared to the pre-crisis level. This was mainly attributable to the significant inflows of EU development funding.

Role of EU funds in investment in Hungary

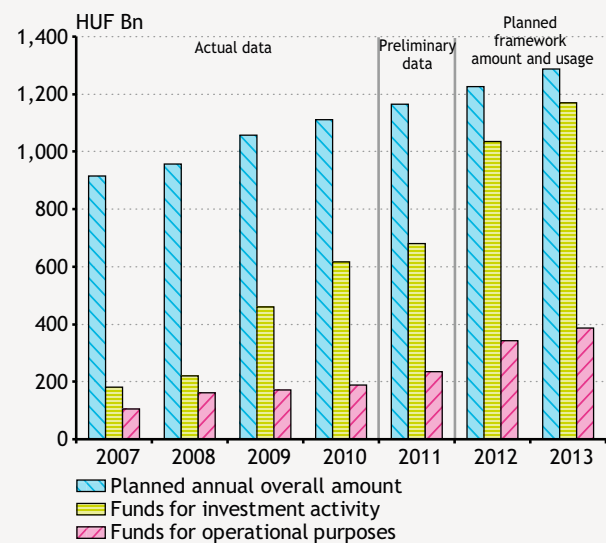
Hungary receives funding from the EU in several forms. In terms of investment, the most important ones are the funds present in the budget; of these, the amounts coming from the Structural Funds and the Cohesion Fund, and the amounts for rural development are the most substantial.

In the 2004–2006 period, the funding available to Hungary was considerably smaller, but in the 2007–2013 period the annual financial allocations increased. The available figures indicate that in 2007–2008 only one quarter of the funds available were utilised, while this ratio rose to one half of the annual financial allocation in 2009, in 2010–2011 it was close to the total allocation available for the year, and this year it is expected to exceed that amount. It should be noted that the financial allocation for the current year is not lost if it is not utilised in the given year; EU rules allow for the use of funding across years.

The role of EU funds in the real economy is particularly important in the case of whole-economy investment as the magnitude of the available financial allocations may amount to 10–15 per cent of the investment volume in the given year. It should be noted that not all inflows of funds to Hungary can be used for gross capital formation; only those items can be taken into account that are not used towards operation of the institutional system or for various HR projects.

The use of EU funds is not restricted to the government sector in the narrow sense, as they can be applied for by every sector of the economy. In terms of investment, funds can primarily be applied for financing infrastructure projects and for enterprise development. They are of outstanding importance in government investment as the fiscal consolidation has diverted the government's investment activity towards projects that can be implemented with EU funding; thus the government's investment rate has not declined in recent years, despite the gradually shrinking own funds provided by the government.

Chart 8
Proposed and actual use of EU funds



Source: NGM

Household investment declined significantly mainly in Hungary and Slovenia. Between 2008 and 2011, the investment rate of households as a percentage of GDP dropped by 35–40 per cent. By contrast, in Slovakia and Poland there was a slight decline of 10–15 per cent in this three-year period, while in the Czech Republic and Romania household investment did not decline to any appreciable extent.

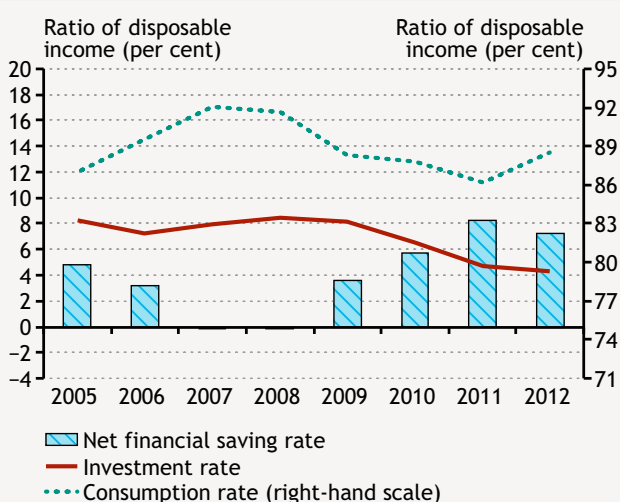
In Hungary, capital formation of households represents 20–25 per cent of total investment, with the overwhelming majority⁵ of this relating to the real estate market (purchase of new home, renovation of old property). Proportionally, household investment showed the steepest decline during the crisis: in the case of the housing market, the number of new homes completed per year shrank to one third by 2011, the lowest level since the political transition. The drastic decline in demand entailed a persistent drop in housing prices.

The decline is attributable to several causes. On the one hand, dynamic growth started in the Hungarian housing market early in the 2000s, initially driven by the government-subsidised forint denominated housing loan programme and later by the explosive growth in foreign currency lending. After the onset of the crisis, the exchange rate of the forint weakened considerably and the foreign currency denominated housing loan stock placed a severe additional burden on households. With an increase in repayment

burdens, a further deterioration took place in the income position of households. In parallel with the setback in aggregate demand, businesses reduced their costs through wage cuts and layoffs, and thus unemployment grew and the real income of households decreased. As a first step, households reacted to the recession environment by a rapid reduction in consumption. Subsequently, after 2009, their consumption rate stabilised, and even increased slightly. However, a sustained decline has been observed in the investment rate. As a proportion of disposable income, the investment rate halved during the crisis years, and thus the postponement of investment has become one of the most important channels of adjustment for Hungarian households. In addition to the blanket ban on foreign currency lending, forint lending was also suppressed, which also led to a drop in home purchases (Chart 10).

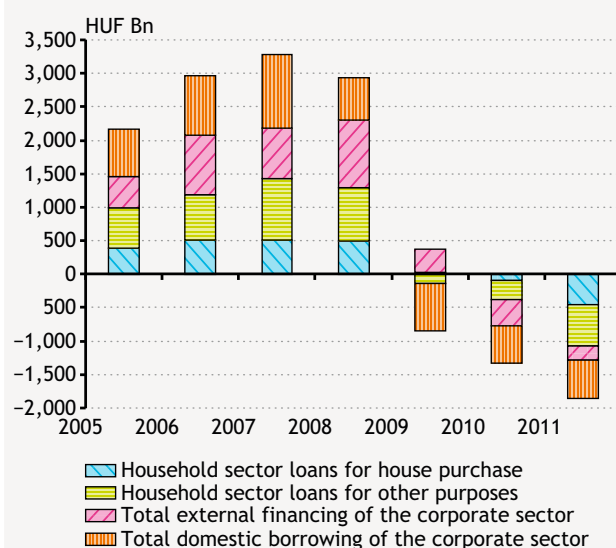
Corporate investment constitutes some 55–70 per cent of total investment in the countries of the region; consequently, this was the sector that typically suffered the greatest setback. The situation appears to be worst in Romania and Slovenia, where corporate investment continued to decline in 2011, while in other countries including Hungary the corporate investment rate improved to some extent last year, but it has not reached the pre-crisis levels in any country as yet. While the decline in government and household investment typically reflects weaker longer-term underlying trends in the region, in the case of businesses a minor decline was observed, which was partly attributable to the favourable investment performance of exporting

Chart 9
Households' investment, consumption and net financial savings rates



Note: The surge in the net financial savings rate and the decline in the consumption rate in 2011 are explained by the disbursement of the private pension fund real yields.
Sources: MNB and CSO.

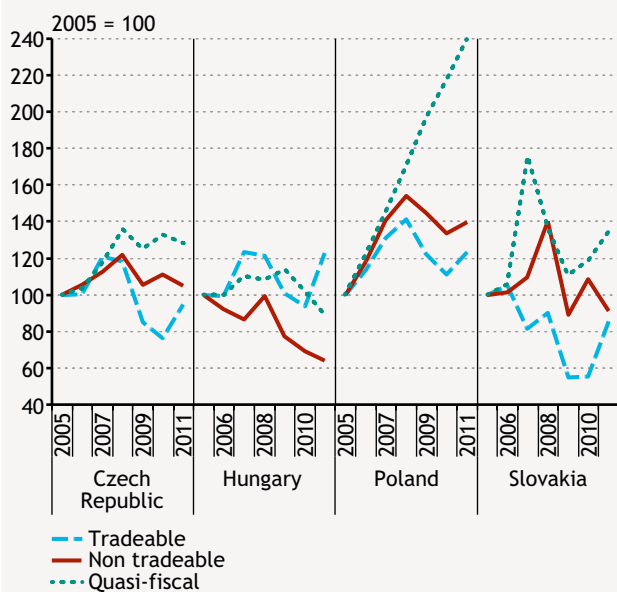
Chart 10
Net borrowing of households and businesses



Forrás: MNB.

⁵ Machinery investment of agricultural sole proprietors is also classified in the household sector and it represents 25 per cent of investment activity.

Chart 11
Corporate investment in the region by industry



Source: Eurostat.

foreign companies that moved to the region before or during the crisis. Breaking down corporate investment to industries, different trends emerge in industries producing primarily for exports (manufacturing, agriculture), producing mostly for the domestic markets and service industries (e.g. trade, catering, communication, financial services) and quasi-fiscal⁶ corporations.

The investment activity of exporting companies has been improving in every country, which is explained primarily by the high export demand from Asia and the new manufacturing capacities moving into the region. In the case of the group producing or providing services for the domestic market, corporate accumulation fell considerably, in line with weak domestic demand. Considering that demand prospects have been extremely uncertain for quite a long time, we continue to expect poor investment performance from this group of businesses. For quasi-fiscal sectors that are partly commercial but also contain a significant government element, regional trends reveal a mixed picture. In general, compared to the outbreak of the crisis, a slight decline is observed in Slovakia and the Czech Republic, whereas in the case of Poland the figures reflect the infrastructure projects for the European football championship of 2012. By contrast, the downturn was more significant in Hungary.

Investment by quasi-fiscal corporations is strongly linked to EU funds, which explains their more moderate decline.

A detailed examination of Hungarian trends shows that 55-60 per cent of total investment comes from corporate investment, approximately two-thirds of which is used for the purchase of machinery and equipment, with only one third relating to buildings and other structures. After the onset of the crisis, investment declined substantially both in industries producing for the domestic market or providing services, and in exporting industries. Negative expectations relating to poor demand are shown by the fact that in the manufacturing industry, which accounts for some half of corporate investment, there was 15 per cent less investment in 2009 than in the previous year. In addition to the contraction of aggregate demand, the sharp drop in corporate lending (Chart 10) and the more expensive purchase of imported machinery due to the weakening of the exchange rate also hindered corporate investment. The special taxes imposed due to the fiscal consolidation further reduced the profitability of certain sectors (trade, financial sector, energy, telecommunication) and thus also their willingness to invest.

The decline in corporate investment may be partly explained by the substantial excess capacity in producing sectors. In the case of industries producing mostly for the domestic market, capacity utilisation has been on a downward trend since 2006, and it has departed even more from the capacity utilisation indicators typical for exporters.

Despite the generally unfavourable investment climate, some positive signs were seen in the exporting sectors even during the crisis. In recent years, several large investment projects were started in Hungary and as it was noted earlier,⁷ the appearance of a major foreign-owned manufacturing company in itself can improve the investment scene considerably. The favourable effects of investment by foreign companies in the machinery and transport equipment industries (Audi, Mercedes, Opel, Hankook) appeared in the second half of 2010 and remained substantial until the end of 2012. However, it should be noted that despite these large individual projects, underlying trends continue to be weak in the manufacturing industry. The investment activity of manufacturing sectors producing for the domestic market has fallen by one quarter from its 2005 level.

⁶ The problem with industry classification is that even a detailed breakdown will contain both government-induced and purely commercial investment, e.g. motorway construction, railway renovation, energy projects. To address investment outside the government sectors in the narrow sense, we prepared our own classification for industry groups where the quasi-fiscal industry group contains the energy sector, water management, transportation and several minor service industries.

⁷ In 2007, the tyre manufacturing plant of the South Korean Hankook substantially improved the growth rate of manufacturing industry investment.

In a regional comparison, the picture is quite favourable for exporting industries, thanks to large capital projects, while Hungary registered the steepest drop in the region in other industries. Industries producing for the domestic market or providing services invested almost 40 per cent less than in 2005, which is partly attributable to weak domestic demand and the poor economic outlook, though it should be noted that the special levies imposed on certain sectors (trade, communication, financial services) may also have contributed to the weak investment activity.

Economic agents' expectations play an important role in developments in corporate investment. In the regional competition for investment, the assessment of the competitiveness of the given economy is important. The indicators of various rankings of the business environment evaluate individual countries on the basis of a number of criteria (economic growth, due process of law, taxation, administrative burdens, labour quality, etc.).

Based on the Growth and Competitiveness Index of the World Economic Forum of Davos, Hungary is in the middle group within the region. The index takes into account a number of variables; competitiveness does not depend exclusively on the business environment. Hungary's relative position within the region was at its worst in 2008, improving slightly by 2012. Of the sub-indices relevant for the business environment, the assessment of the macroeconomic environment improved significantly between 2006 and 2012, while in the case of the sub-indices for public and private institutions, education, the labour market and technology, the position of the country deteriorated markedly both in regional and global comparison.

Another international survey, the World Bank's 'Doing Business in', focuses mostly on the business environment and the underlying institutional conditions such as: starting a business, protection, administrative cost of and tax payment by investors, or due process of law. In 2006, Hungary was second among the six countries under review. According to the most recent ranking, Hungary is the last in the region at present, and the country's assessment is particularly unfavourable in the case of the sub-indices that compare the protection of investors and tax payment. Although in the case of some of the components under review the assessment of the country has improved, its relative assessment in the case of several criteria relevant in terms of investment has deteriorated, which carries downside risks to new investment.

CONCLUSIONS

In a regional comparison, Hungary's position is weak in terms of investment. The investment rate was among the lowest in the region at the onset of the crisis and has remained so ever since. Most of this shortfall already existed in the pre-crisis period, and it has increased somewhat since the outbreak of the crisis. In the pre-crisis years, the decline in the investment rate was mostly caused by the decline in government and corporate investment. The adjustment in 2006 resulted in a major fall in the government investment rate, which was stabilised by an increased inflow of EU funds following the crisis. Although in terms of dynamics, developments in domestic corporate investment have been similar to the regional average since the crisis, regarding corporate investment as a proportion of GDP, Hungarian enterprises continue to spend 3-5 percentage points less on accumulation than Hungary's neighbours in the region. Persistently lower corporate investment may present a lasting investment problem; the shortfall is most obvious in the case of the sectors producing and providing services for the domestic market, while in the case of exporting companies investment activity was maintained by the large investment projects of recent years. Apart from this significant individual item, underlying developments are weak in this segment as well. Although prior to the crisis there were no signs of evolution of a housing market bubble in the domestic housing market, Hungary has seen household investment decline the most in recent years. The restraining of investment expenditures has become one of the most important channels of households' balance sheet adjustment. Considering that due to the significant revaluation of foreign currency denominated debts household indebtedness – as a proportion of disposable income – is still close to the 2008 level, the absence of household investment may remain a protracted process for years to come.

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Zita Véber and Judit Brosch: Can cash payment be limited in a modern payment system?¹

Is it acceptable that festivals allow payment by festival cards only but not by cash, and that some airlines will sell you flight tickets only if you use your bank card to purchase online? In connection with the interpretation of the legal tender status of banknotes and coins, different views have been voiced in recent years: whether cash or certain denominations of banknotes and coins (large-denomination banknotes, small-denomination coins) can be rejected as means of payment for products or services; whether it is acceptable that a product or service can be paid only through electronic payment instruments, and whether cash surcharges can be applied. In the opinion of the Magyar Nemzeti Bank as the body responsible for the issuance of forint banknotes and coins, the legal tender status of banknotes and coins does not mean their obligatory acceptance for payment under all circumstances. In this article, we provide an overview of the various approaches to the legal tender status and present the technical arguments which we believe support the position of the MNB.

INTRODUCTION

In the past decade, the advance of modern information technologies has led to the spread of new electronic forms of payment. As with any innovation, new solutions give rise to new questions. It is no different in the case of payment instruments. Because of the widespread use of electronic payment instruments, private persons have approached the MNB as the entity responsible for the issuance of money on several occasions. They complained that they had been unable to purchase certain products or services with cash; they had to use some electronic payment instrument, mostly a bank card. To mention but a few examples: organisers of increasingly popular festivals like to issue festival cards that can be loaded using cash or bank cards at the festival location; this (and only this) card can be used by festival visitors for payments; some airlines allow flight tickets to be paid only through the internet using bank cards; recently a café was opened accepting bank cards but not cash. In all these cases, the question was whether it was legitimate for retailers to refuse cash, so that persons wanting to purchase the product or service concerned need to have a bank card or need to load the card issued by the event organizer for the purpose of payment.

It is no coincidence that the issue of mandatory acceptance of cash has been raised just now. New non-cash payment

instruments have become common; in some market segments their use has become so widespread that retailers are no longer afraid that their competitiveness will suffer if they accept only cashless payment. For them, this is safer and cost effective; for their customers, it is safer, cheaper and more convenient.

When cash was the only possible means of payment for daily purchases, the provision of the Central Bank Act governing the legal tender appeared to be self-explanatory.² Today we can choose from among several electronic payment methods (deposit card, credit card, pre-paid card, reloadable card, mobile payment, online payment, etc.). This situation has put the provisions of the Central Bank Act on legal tender in a new perspective and raised questions: What does the legal tender status of banknotes and coins mean? Is it compulsory to always accept any denomination of banknotes and coins qualified as legal tender?

The European Commission has also addressed these issues and other questions relating to legal tender and issued a recommendation³ on this subject in 2010. The position of the MNB on the mandatory acceptance of legal tender is different from the recommendation of the European Commission. The subject is particularly topical as the Commission is expected to follow up on the implementation of the recommendation in the first half

¹ We would like to thank Dr Ildikó Szeder Gubek for her useful legal comments.

² Act CCVIII of 2011 on the National Bank of Hungary, Article 27 (2).

³ Commission Recommendation of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU).

of 2013 and assess the need for any additional, legally binding legislation.

From a legal aspect, we can establish that the retailer's refusal of cash payment and its practice of accepting electronic payment instruments only does not violate the

provisions of the Central Bank Act. In this study, we examine the meaning of legal tender status, review the legislation of various countries to the interpretation of legal tender and present the considerations that led the MNB – as the entity exercising the right of issuer – to adopt its position.

Box 1

Limitation of use of banknotes – Constitutional Court's resolution

With the spread of ticket machines and vending machines accepting only coins, the question of interpretation of the concept of legal tender arose quite some time ago. In this context, the Constitutional Court adopted the following position in response to a complaint from a citizen to the effect that banknotes are also legal tender and that they must also be accepted as payment by operators of parking meters:⁴ the "provision⁵ [in the Central Bank Act] does not rule out the possibility that the special characteristics of the various payment methods shall prevail, within reasonable limits, when making payment for various goods or services. Instances where payment can be made, alternatively or exclusively, at a machine is a special payment method".

DEFINITION OF CASH AS LEGAL TENDER IN THE CENTRAL BANK ACT AND IN THE VIEW OF THE MNB RESPONSIBLE FOR THE ISSUANCE OF CASH

In Hungary, the MNB has the right and responsibility to issue banknotes and coins. In respect of the issue of cash, the Central Bank Act contains the following key provisions:

Article 4 (2) The MNB shall be entitled to issue banknotes and coins. Banknotes and coins – including commemorative banknotes and coins – issued by the MNB shall be legal tender of Hungary.

Article 27 (1) The Governor of the MNB shall declare in a decree the issue of banknotes and coins, their denominations and distinguishing features and their withdrawal from circulation. The banknotes and coins withdrawn from circulation shall lose their function as legal tender as of the date specified in the decree of the Governor of the MNB.

The Central Bank Act provides the following on the acceptance of cash:

Article 27 (2) Each person shall be obliged to accept banknotes and coins issued by the MNB at face value

for payments to be made in official Hungarian currency until withdrawal.

This provision imposes the obligation to accept legal tender at face value, i.e., if the payment is made in cash, banknotes and coins shall not be accepted at a value different from their face value (e.g. a 100-forint coin for the value of 90 forints), while the provision quoted contains no obligation as to the payment method. Nevertheless, in our experience, the private persons complaining to the MNB as issuer about their inability to pay with cash interpret Article 27 (2) of the Central Bank Act as requiring everyone to accept cash for payment, that is, payment with any denomination of banknotes or coins should be possible under all circumstances.

Incidentally, the Central Bank Act itself also contains provisions limiting cash payment to the effect that the acceptance of coins in unlimited quantities is not obligatory when cash payment is accepted. That is, economic agents other than credit institutions and post offices are allowed not to accept more than 50 coins in a single payment.

Article 27 (4) For cash payments, including cash payments to a payment account, credit institutions and institutions operating the postal clearing centre shall be obliged to accept more than 50 coins.

⁴ Resolution No. 1063/B/2005. of the Constitutional Court.

⁵ Act LVIII of 2001 on the National Bank of Hungary, Article 31 (2) as effective at the time.

CONCEPT OF LEGAL TENDER IN THE LEGISLATION OF DIFFERENT COUNTRIES

Other countries have also given consideration to the interpretation of the concept of legal tender in their acts on the status of central banks or in other financial legislation. In 2010, the European Commission set up an expert group with the participation of the euro-area Member States to discuss this issue. They established that there were only a few Member States that had financial legislation to define the elements of the concept of legal tender, the reason being that national legislation consider this concept to be 'generally accepted'.⁶ In contrast, outside the euro area, typically in Anglo-Saxon countries, there are examples where the national legislation on legal tender is more detailed and the central bank of the country provides additional interpretation of the rules, publishing its position on its website as the case may be.⁷

Elements of the concept of legal tender

The comparison of the legislative provisions and interpretations of the countries reviewed concerning legal tender shows that the following three elements of the concept of legal tender are present in the laws of most countries.

Standardised medium of payment protected by the state

Legal tender is a standardised medium of payment issued by the body authorised for this purpose⁸ in the denomination structure corresponding to the requirements of cash circulation. The issuer determines its physical appearance and characteristics, issues it as a means of payment for payment transactions, withdraws it from circulation and protects it against counterfeiting with a number of laws and printing processes. In modern economies, a standardised cash system is a precondition for smooth payment transactions.

Acceptance at face value

It is an important feature of the legal tender, that it must be accepted at face value. This is stated in the legislation of several countries.

Power to discharge monetary debt or obligation

The legal tender is the instrument for the payment of monetary debt and obligations. Creditors may not refuse the settlement of debt or obligations in cash except where the parties agreed on other means of payment. A debtor discharges a debt by transferring a means of payment with legal tender status to creditor.

Acceptance of legal tender – can cash be rejected for payments?

There is also general consensus that the choice of the payment method or instrument to be used for payment depends primarily on the agreement between the parties, just as the specification of other terms of payment (time, location, etc.).

This follows from the principle of contractual freedom, which means that the contractual parties are free to decide whether to enter into contract and agree on all material terms. In the scope of transactions between economic entities (B2B transactions), the primacy of contractual freedom is easy to understand as agreeing on the terms and payment method is part of the bargaining process.

By contrast: in a retail transaction, would a retailer be obliged to accept cash payment when a customer insists on paying in cash or based on contractual freedom may the retailer decide not to make a deal (informing customers in advance that only cards are accepted at the shop)? In other words: does legal tender mean that it must be accepted at all times, except where the parties agreed upon the use of a different payment method or payment instrument in advance? On this issue, the position of the Anglo-Saxon countries and four euro-area Member States (Finland, the Netherlands, Ireland and Germany) is different from the view of the majority of euro-area countries.

The U.S. legislation defines legal tender as follows: "United States coins and currency are legal tender for all debts, public charges, taxes, and dues."⁹ In other words, the legal tender status means obligatory acceptance only in respect of payments under contracts already concluded, discharging existing debt or obligations (naturally except in cases where parties had previously agreed to use some other payment method or payment instrument). The relevant British

⁶ ELTEG (2010).

⁷ http://www.federalreserve.gov/faqs/currency_12772.htm, <http://banknotes.rba.gov.au/legaltender.html>, <http://www.royalmint.com/aboutus/policies-and-guidelines/legal-tender-guidelines>

⁸ Central banks are authorised to issue banknotes, while in a number of countries the Ministry of Finance has the right to issue coins.

⁹ Article 31 U.S.C. 5103 of Coinage Act of 1965.

legislation also contains a similar provision in respect of the discharge of debt in legal tender.¹⁰

Based on these rules, the central banks of Anglo-Saxon countries have clearly taken the view that retailers may not be obliged to accept cash unless debt has been incurred. "There is, however, no Federal statute mandating that a private business, a person, or an organisation must accept currency or coins as payment for goods or services" – the Fed interprets the legal tender provisions of the Coinage Act on its website.¹¹ On the website of the Australian central bank a similar position is stated.¹²

Four of the euro-area Member States (Finland, the Netherlands, Ireland and Germany) are also of the opinion that the legal tender provision applies to contracts already concluded; therefore, the retailer is not obliged to accept cash as payment for products or services.¹³ Under the regulations effective in the Netherlands, a retailer may refuse the use of cash for making payment if it is clearly posted at the entrance of the shop that only cards are accepted for payment.

According to the majority of euro-area Member States (with the exception of the four countries mentioned previously), however, the retailer is obliged to accept cash if the customer wants to pay in cash. This view is reflected in the Commission recommendation referred to above, which states in point 2: "The acceptance of euro banknotes and coins as means of payments in retail transactions should be the rule. A refusal thereof should be possible only if grounded on reasons related to the 'good faith principle' (for example the retailer has no change available)".¹⁴ They explained their position arguing that while in B2B transactions the parties are deemed to have an equivalent negotiation power, therefore the choice of the payment method and payment instrument may be based on contractual freedom, in business to consumer (B2C) relationships the bargaining positions of the parties are not equivalent, therefore the principle of contractual freedom can be limited. In other words, retailers cannot decide at their discretion and they must accept cash if the customer insists on paying in cash.

As the introduction stated, the MNB as issuer has adopted a position close to the views of Anglo-Saxon countries and the four aforementioned Member States¹⁵ in considering that the acceptance by a retailer of only electronic payment instruments to pay for a product or service is not against the Central Bank Act. Even though the exclusive acceptance of electronic payment methods may be constrained by civil law or consumer protection considerations in certain cases, the examination of those considerations is beyond the competence of the MNB.

In the following, we look at the considerations behind the MNB's decision to promote electronic payment instruments and not to prohibit their exclusive use.

BENEFITS OF ELECTRONIC PAYMENT INSTRUMENTS FOR THE NATIONAL ECONOMY

Electronic payment methods have a number of benefits over cash payment; in the following, we highlight three of these. The traceability of transactions, efficiency and security are the key reasons that electronic payments are more beneficial for society than cash payments. Using these three dimensions, we present the features of cash that lead to restrictions on the acceptance of cash in European countries including Hungary. We also discuss cases where the rule applied does not limit the use of cash payment generally, only the acceptance of certain denominations of coins or banknotes.

Restriction of the use of cash to combat the shadow economy

Cash is anonymous; this is why it is the ideal means of payment in the black economy. In recent years, the MNB has published several studies analysing the causes of the high cash usage in Hungary in international comparison,¹⁶ concluding that the high cash intensity of the Hungarian economy was partly due to the shadow economy as cash transactions are easier to conceal from the tax authority. For reasons of whitening the economy and combating illegal activities, the MNB has urged the restriction of the use of

¹⁰ Legal tender has, however, a very narrow technical meaning in relation to the settlement of debt. If a debtor pays in legal tender the exact amount he/she owes under the terms of a contract (and in accordance with its terms), or pays this amount into court, he/she has good defence in law if he/she is sued for non-payment of the debt. <http://www.bankofengland.co.uk/banknotes/Pages/about/faqs.aspx>.

¹¹ „There is, however, no Federal statute mandating that a private business, a person, or an organization must accept currency or coins as payment for goods or services.” http://www.federalreserve.gov/faqs/currency_12772.htm, <http://www.richmondfed.org/faqs/currency/>

¹² <http://banknotes.rba.gov.au/legaltender.html>

¹³ See ELTEG (2010).

¹⁴ Commission Recommendation of 22 March 2010 on the scope and effects of legal tender of euro banknotes and coins (2010/191/EU).

¹⁵ In addition to Germany, Finland, Ireland and the Netherlands, Scandinavian countries are also pioneers of the use of electronic payments, which is reflected in their legislation (e.g. Leo Van Hove, 2003).

¹⁶ Odorán and Sisak (2008), Bódi-Schubert (2010).

cash through the promotion of electronic payment instruments in its publications as well as in government forums.

Even though the majority of euro-area countries considers the acceptance of cash mandatory for both the settlement of monetary obligations and the execution of retail payments, according to recital (19) of Council Regulation (EC) No 974/98 on the introduction of the euro, the use of cash can be restricted for public reasons: "limitations on payments in notes and coins, established by Member States for public reasons, are not incompatible with the status of legal tender of euro banknotes and coins, provided that other lawful means for the settlement of monetary debts are available."

A number of the Member States have enacted rules limiting payment in cash above a certain ceiling in transactions between businesses and/or private persons and requiring the use of electronic payment methods.¹⁷ Furthermore, some countries require taxes to be paid by bank transfer, and public sector payments and transfers are also made exclusively through electronic means of payment.¹⁸ In Denmark, in addition to electronic payment being compulsory above DKK 10,000 (approx. HUF 400,000), both providers and purchasers are incentivised to comply as both are held jointly and severally liable for any VAT or other tax fraud.¹⁹ In Italy, incentives additional to the limitation of cash payments have been enacted to promote the spread of electronic payments. Since October 2012, public administration bodies and public service providers have been required to accept electronic payment methods and from 2014 on every economic entity offering products or services will be obliged to accept payment by debit card.

The regulation entered into force on 1 January 2013 limits cash payments above HUF 1.5 million in Hungary as well, but only between persons regularly engaging in economic activities.²⁰

There are also regulations²¹ or practices restricting cash payments to or from the Hungarian government:

1. The Act on the Rules of Taxation requires entities regularly engaging in economic activities to make cashless payments.²²
2. The overwhelming majority of the remuneration of public servants and government officials is paid into payment accounts.²³
3. Some public institutions limit the cash payments of households; some universities, for instance, only accept payments from students electronically and they pay scholarships exclusively into bank accounts.

It should be noted, though, that one third of the payments by and to the government, some 100 million transactions a year, continue to be carried out in cash rather than electronically.

The examples above indicate that states, including Hungary, limit cash payment to combat the shadow economy, and this effort is supported if the government promotes the wide-spread use of electronic payment instruments in the retail sectors.

The costs of cash payment are high

According to the MNB's survey of the social costs of payment instruments,²⁴ the Hungarian society could save some HUF 100 billion annually if cash payments were replaced by electronic transactions and similar usage ratios of payment methods were reached as in the Northern European countries. At first sight, cash payment has no cost if regarded from the aspect of the customer and only the costs incurred at the time of payment are taken into account. However, the study also assessed all social costs of the electronic payment methods and cash payment and demonstrated that the costs of cash payment exceed the costs of electronic payment.

The fix costs of cash payment are lower than those of electronic payment but the costs relating to cash payment increase proportionately with the volume of cash transactions (production, transportation, storage, control)

¹⁷ For more detail, see Turján et al. (2011), Odorán and Sisak (2008).

¹⁸ MNB (2012b).

¹⁹ If the customer is unable to pay electronically, he is relieved from the joint and several liability as long as he notifies the tax authority of the cash transaction. See: Opinion of the European Central Bank on limitations on cash payments (CON/2012/37) Denmark, 10.5.2012, pdf

²⁰ Subsection (3a) of Article 38 of Act XCII of 2003 on the Rules of Taxation.

²¹ Pursuant to Article 63 (3) of Act LXXXV of 2009 on the Pursuit of the Business of Payment Services, the mandatory use of any payment method can be prescribed only in an Act of Parliament or government decree.

²² Article 38 (1) of Act XCII of 2003 on the Rules of Taxation.

²³ Article 79/A of Act XXXIII of 1992 on the Legal Status of Public Servants, Article 143 of Act CXCIX of 2011 on Public Service Officials.

²⁴ Turján et al. (2011).

while the unit cost of electronic payments on the level of the national economy decreases with the increase in the number of payment transactions. When choosing a payment method or payment instrument, cost efficiency is an important aspect for economic agents. Consequently, in the future it is expected that more retailers will refuse payment in cash. In recent years, the card acquiring network has expanded dynamically but it is still considerably below the level seen in most EU countries.²⁵

The high cost of using large volumes of coins for payment has been evident for quite some time. Consequently, regulations issued by most central banks allow the limitation of payment with coins. In the euro area Member States²⁶ and also pursuant to the Hungarian Central Bank Act,²⁷ parties are not obliged to accept more than 50 coins in cash

payment transactions with the exception of the issuing bodies and certain designated institutions with a key role in cash distribution (in Hungary: credit institutions and post offices). The regulations in Australia, Canada and the UK also limit the mandatory acceptance of certain coin denominations, setting different ceilings for payment with the different denomination coins²⁸ (e.g. in the UK, 50p coins can be used to settle payment up to 10 pounds).

The use and distribution of small-denomination coins is very costly for economic agents in almost every country. Consequently, the possibility of ceasing the issuance of or withdrawing from circulation small-denomination coins not circulating any more in the economy arises time and time again (for more details, see Box 2).

Box 2 Small-value coins

The issue of the use of small-denomination coins is also linked to the high cost of cash payment. Because of changes in price levels and price structures, the problem every country encounters from time to time is that the purchasing power of small-denomination coins drops too low, they no longer take part in cash circulation due to their low value, they are hoarded in jars, customers do not re-introduce them into circulation: they increasingly become 'single-use'. They are used mostly for the exact settlement of small-value purchases. Consequently, the volume of issue of these denominations is by far more than that of larger denomination coins and the cost of their production, distribution, processing and storage is very substantial. This process led the MNB to withdraw 1- and 2-forint coins from circulation in 2008. Retailers did not re-price their products after the withdrawal of these coins; instead, they rounded the final sum payable on goods in line with the rules laid down in the Act on Rounding.²⁹ After withdrawal, the MNB carefully examined the potential inflation effects of this measure, but no demonstrable price increasing effect was found. According to household surveys, the overwhelming majority of the population supported the withdrawal of the inconvenient and costly small denominations that made purses heavy. Small denomination coins were withdrawn in a number of countries in a similar manner.³⁰

In some of the euro -area Member States the role of 1- and 2-cent coins is very similar to that of the 1- and 2-forint coins in Hungary. Therefore, before introducing the euro, two euro-area Member States (Finland and the Netherlands) decided not to issue small-denomination coins and to use rounding rules for payments. This does not mean, however, that 1- and 2-cent coins are not legal tender. All it means is that the Finnish and Dutch central banks do not issue 1- and 2-cent coins, cashiers are not obliged to give change of 1 and 2 cents when they apply the rounding rules; however, if somebody (particularly a foreigner) wants to pay with those denominations, the coins are accepted.

As small-denomination coins are responsible for a very substantial part of the cost of coin distribution, other countries in the euro area also consider from time to time the possibility of withdrawing these denominations from circulation and introducing rounding rules. However, in the expert group of euro-area Member States³¹ the majority was of the opinion that all remaining euro-area Member States should refrain from withdrawing small denominations and introducing rounding rules. The main argument was that rounding rules

²⁵ MNB (2012a).

²⁶ Pursuant to Article 11 of Council Regulation 974/98/EC.

²⁷ Article 27 (4) of the Central Bank Act.

²⁸ <http://laws-lois.justice.gc.ca/eng/acts/C-52/page-1.html>

²⁹ Act III of 2008 on the Rules of Rounding Required as a Consequence of the Withdrawal of 1- and 2-forint Coins from Circulation.

³⁰ For more detail see Leszkó (2009).

³¹ See ELTEG (2010): This is also the opinion of experts of countries with high per-capita GDP where the purchasing power of 1 and 2 eurocent coins is so low that these denominations have effectively become 'single-use'.

contradict the notion of legal tender of 1- and 2-cent coins. In its aforementioned recommendation of 2010, the European Commission reflected the majority position. In view of the high social cost saving that would result from the withdrawal from circulation of small-denomination coins, and the fact that rounding had no inflation effect in the countries that opted for it, the Commission will hopefully change its position in this matter.

Security

Security considerations may also motivate retailers to refuse payment in cash. In addition to the personal safety of persons working in the shops, the safekeeping, handling and transportation of cash requires special security equipment due to the risk of robbery. These investments are not necessary when electronic payments are used. The insurance premium is also lower for the business if no cash is handled.

In the case of payment of large amounts in cash and in respect of businesses operating at a large distance from any credit institution or other deposit facility (post office) that are unable to deposit cash receipts in their bank account on the same day, refusal of cash payment is allowed based on

the 'good faith principle' even in the countries where the refusal of cash is not acceptable in different circumstances.³²

For a business, holding cash for the sole purpose of having change for cash payments is a security risk. This consideration is appreciated by the French regulations, which make the acceptance of cash mandatory only if the payer discharges his obligation by paying the exact amount due.³³

Sometimes customers find it difficult to pay with large-denomination banknotes because retailers refuse to accept them for security and/or efficiency reasons. Based on the proportionality principle, the refusal of payment in large-denomination banknotes is allowed in the jurisprudence of most countries (for more details, see Box 3).

Box 3

Acceptance of high-denomination banknotes

Serving customers who want to buy small-value goods using high-denomination banknotes, particularly early in the morning, is difficult for retailers as they have already deposited their previous day's receipts in their bank account for security and financial management reasons and hold only change at the opening of the day. Therefore in most countries' laws, based on the proportionality principle, retailers are not obliged to accept large-denomination banknotes if their value is not in proportion to the amount to be paid.³⁴

When withdrawing cash from an ATM, the withdrawer has no control over the denomination structure of the cash dispensed. Consequently, the MNB requires in its decree credit institutions and post offices to exchange on one occasion a maximum of 50 pieces of banknotes or coins into different denomination banknotes and coins, to make sure that economic agents have the appropriate denomination of banknotes and coins necessary for their cash transactions.³⁵ Most credit institutions and post offices offer this service free of charge to their clients.

The denomination structure of euro banknotes includes two large denominations, 200 and 500 euro banknotes, the value of which far exceeds the customary value of everyday payments. According to the ECB survey on the use of cash, over half of the population of euro-area Member States have never seen a 500 euro banknote, and 44 per cent have never held a 200 euro banknote in their hands.³⁶ As the public very rarely if ever sees such banknotes, their acceptance is uncertain. Consequently, the euro area Member States started

³² See ELTEG (2010).

³³ Art L112-5 du Code Monétaire et Financier: En cas de paiement en billets et pièces, il appartient au débiteur de faire l'appoint. The French financial laws contain no definition of legal tender status. In the case of payment with banknotes or coins, the Act quoted above requires the debtor to pay the exact amount due. French criminal law provides for the offence of refusal to accept payment in cash, but this provision is enforced only if the debtor would pay the exact amount in cash and the merchant refuses to accept it. Such a court case is described at the following link: <http://www.avocat-lingibe.com/question-reponse-juridique/entreprise/consomation-25.html>.

³⁴ See ELTEG (2010).

³⁵ Decree No. 11/2011. (IX. 6.) of the Governor of the MNB on the processing and distribution of banknotes and on technical tasks relating to the protection of banknotes against counterfeiting.

³⁶ For more detail see ECB (2011).

to consider whether retailers could refuse to accept payment with these banknotes. In the Netherlands, for instance, retailers are not required to accept large denomination banknotes if this fact is clearly indicated by means of a sticker at the entrance to the shop or filling station.³⁷ The US has adopted a similar practice in respect of large-denomination banknotes.³⁸ The majority of euro-area Member States, however, reject this practice and accept the refusal of large-denomination banknotes only on an occasional basis under the proportionality principle.³⁹

The above examples show that to some extent the authorities of each country reviewed acknowledge the attempts of businesses to restrict the acceptance of cash as long as it is justified by security or efficiency reasons. Within the euro area the majority of Member States consider that the acceptance of cash should be restricted solely on grounds of security. In addition, based on the principle of good faith, they consider it legitimate to refuse cash payment because the seller is temporarily short of the required change.⁴⁰ Nevertheless, endeavours by the government to limit cash payments to combat the grey and black economy have become more pronounced in the past one year or two in almost every Member State.

ARE CASH SURCHARGES ACCEPTABLE?

The payment services directive⁴¹ (hereinafter referred to as the 'Directive') provides that in order to encourage competition and the use of efficient payment instruments, Member States may decide at their discretion to forbid or limit the levying of charges for the use of a certain payment instrument by retailers.

The survey conducted in 2011 on the transposition of the Directive by the Member States⁴² reveals a mixed picture on whether Member States made use of the possibility to forbid or limit the levying of charges in legislation. Half of the Member States excluding Hungary (e.g. Austria, Denmark, France, Italy, Sweden) specifically prohibited such surcharges, two of them did so only in respect of payment by card though. Thirteen other Member States (e.g. Belgium, the Netherlands, Germany, Spain, the United Kingdom), however, did not make use of this option provided in the Directive, while some of them allow such charges to be imposed in proportion to the actual costs incurred by the use of the payment instrument concerned.

At the time of its entry into force on 1 November 2009, the Act on Payment Services⁴³ transposing the Directive into Hungarian law was lenient on the imposition of charges and costs. However, in the amendment of the Act effective as of 1 January 2011 the legislator prohibited the imposition of charges or costs in order to promote the use of cash-substitute payment instruments.

Article 36 (4) The payee may not impose any charges, costs or other payment obligations for the use of a cash-substitute payment instrument.

However, the Directive does not discuss whether charges may be imposed in the case of cash payment.

The issue of cash surcharges divided the experts of euro-area Member States. Some considered that surcharging cash is not compatible with the concept of legal tender (obligation of acceptance at face value) as set out in the Treaty on the Functioning of the European Union. Another group of the Member States consider, however, that the mandatory acceptance of legal tender only concerns the payment of a debt under a contract, and thus it has no bearing on the formation of the contract whereby all material conditions (including the price, with the possibility of a surcharge for a cash payment) are agreed.⁴⁴

The use of electronic payment methods can be efficiently promoted by allowing the payee to charge a fee corresponding to its direct costs relating to the cash payment as long as there are other payment methods (such as credit transfer) available as well. It would also be desirable in the relationship of payment service providers and their customers if every customer bore the costs and charges of their own payment service provider, including customers making cash payments to payment accounts

³⁷ <http://www.dnb.nl/en/news/news-and-archive/nieuws-2010/dnb235121.jsp>

³⁸ <http://www.richmondfed.org/faqs/currency/>

³⁹ See ELTEG (2010).

⁴⁰ See ELTEG (2010).

⁴¹ Directive 2007/64/EC of the European Parliament and of the Council on payment services in the internal market.

⁴² http://ec.europa.eu/internal_market/payments/framework/psd_study_en.htm

⁴³ Act LXXXV of 2009 on the Pursuit of the Business of Payment Services.

⁴⁴ See ELTEG (2010).

using postal inpayment money orders (yellow cheques). However, officially there is no uniform position on the issue of bearing the costs and charges of cash payment. For instance, the Act on Consumer Protection prohibits public utility companies from charging a separate fee for the payment of bills through postal inpayment money orders as of 29 July 2012,⁴⁵ and the Act on Electronic Communications imposes the same prohibition on electronic communications service providers as of 17 November 2012.⁴⁶ The law only allow service providers to give discounts to clients who choose a method for paying their bills that is less costly for the service provider. Because of this restriction, utility companies incorporate the cost of cash management into their rates and make all clients pay for it, including the ones using cheaper electronic payment methods.

The evolution of a more efficient payment structure requires that consumers choosing between payment methods are aware of their respective costs. The prices of different payment methods must provide incentives to users to choose the effective payment structure. This in turn requires that, on the one hand, the fee structures of payment service providers reflect costs and are not distorted through cross-subsidisation between products and services. On the other hand, the costs of cash payment should be borne by those who make use of that means of payment.

SUMMARY

Limiting cash usage is reasonable in the current economic environment and possible under Hungarian law. The MNB is in support of the broader use of electronic payment instruments with an eye to combating the grey and black economy, promoting efficient payment instruments and enhancing security. Consequently, the MNB as the issuer of forint cash is not against retailers accepting exclusively electronic payment instruments.

In respect of payments to and from the government and the regulation of B2B cash transactions Hungary has already taken steps in this direction, but the cash intensity of the economy is still high in a European comparison. This is why further measures are needed to promote the spread of electronic payments. For instance, payees should be allowed to charge a fee corresponding to their direct costs relating to the cash payment if there are other payment methods available as well. Furthermore, in our opinion

consideration should be given to rewording Article 27 (2) of the Central Bank Act, which regulates the acceptance of banknotes and coins, so that the rule unambiguously pertains to the obligatory acceptance of banknotes and coins at face value rather than the acceptance of cash in all circumstances.

We do not think that cash as a payment instrument will disappear in the foreseeable future. Cash has qualities that remain important for society. For instance, at this point many people find it easier to manage their monthly expenditures if the cash in their purse limits overspending while others find the anonymity of cash important to protect their privacy. This may be one of the reasons that even though the overwhelming majority of Hungarian households have bank accounts, many people still withdraw their regular income received on the bank account and settle their utility bills and pay for their daily purchases in cash.⁴⁷ Households that have no bank accounts obviously cannot obtain any regular or occasional income except in cash. There is yet another consideration that will keep cash usage necessary and legitimate in the longer term: in Hungary there are substantial differences between communities, depending on their population size and region, in terms of their access to the infrastructure required for cashless payment (bank branches, POS terminals).⁴⁸

Based on the experience of other countries, however, the spread of electronic payment methods is a clear tendency, particularly because they are more efficient and cheaper. The role of cash is likely to decrease in payments in Hungary as well, if not in terms of volume, but in terms of proportion.

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⁴⁵ Act CLV of 1997 on Consumer Protection, Article 8.

⁴⁶ Act C of 2003 on Electronic Communications, Article 128 (4).

⁴⁷ For more detail see Takács (2011).

⁴⁸ For more detail see Helmeczi (2010).

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Interview with Harald Uhlig

(Katalin Szilágyi and István Kónya)



*Harald Uhlig is Professor at the Department of Economics of the University of Chicago since 2007 and chairman of that department since July 2009, after having taught at Princeton, Tilburg University and the Humboldt Universität Berlin. His research interests are in macroeconomics, financial markets and Bayesian econometrics, and in particular at the intersection of these three. He has served co-editor of *Econometrica* from 2006 to 2010. He is a consultant of the Bundesbank and the Federal Reserve Bank of Chicago. He is the current chairman of the CEPR business cycle dating committee. He is a fellow of the Econometric Society. He is a research fellow of the CEPR and a research associate of the NBER. In 2003, he received the Gossen Preis of the German 'Verein für Socialpolitik'.*

– Can you tell us a bit about your research interests and some current projects you are working on?

I am generally interested in the interaction between financial markets and macroeconomics. I also have an interest in Bayesian time series methods. I have several ongoing projects; some are old and some are new. One project, which I am excited about, is thinking about sovereign debt crises and bailouts. It is motivated by the current situation in Europe. It's a joint work with *Francisco Roch*, who is now working at the IMF, after having been my PhD student at the University of Chicago. We are combining existing debt crisis models, as developed by *Cole* and *Kehoe*¹ as well as *Arellano*², and asking whether there is a potential role for bailouts, and what they will imply. There are many questions one could ask, obviously. We focused on a particular one: could a debt purchase guarantee as perhaps envisioned by the ECB lead to the selection of a good equilibrium among several, and how should it go about it? In the model, there is a possibility of a buyer's strike. Then, since there is a possibility that for a co-ordination failure in the future, where buyers just refuse to buy the debt of a country, current buyers will take that into account, and that can lead to yields being very high compared to a situation without the possibility of such a buyer's strike. This feature of the model captures the view by some, that evil speculators are currently ganging up on some countries in Europe right now and driving up yields, and that therefore policy makers have to step in. In our model, there is nothing evil, of course: debt buyers simply have to take into account that the country cannot roll over its debt in the future. The buyer's strike itself can be self-fulfilling: if buyers go on strike, then the country defaults, and because the country defaults, then going on buyer's strike was a good idea in the first place, since buyers will not get their money back from a country that just defaulted. This coordination problem gives rise to multiple equilibria. We introduce a bailout agency into the model, which really is simply a large investor. The bailout agency seeks to earn the market return just like everybody else, but it's large, right? So it can promise to be there even if nobody else is there to buy the debt of the country. So, if everybody else goes on a buyer's strike, this agency does not go on strike, and if their intervention is large enough, the country will not default, and the other buyers find that they should not have been on strike. The intervention solves the original co-ordination problem and gets to the good low-yield, no-strike equilibrium. Our bailout agency is not losing money or is not unduly profiting from the situation: they are just getting the market return on their portfolio. We then analysed how large the

¹ COLE, HAROLD L. AND TIMOTHY J. KEHOE (2000), "Self-Fulfilling Debt Crises", *Review of Economic Studies*, vol. 67 no. 1, pp. 91–116.

² ARELLANO, CRISTINA (2008), "Default Risk and Income Fluctuations in Emerging Economies", *American Economic Review*, vol. 98 no. 3, pp. 690–712.

promised intervention would have to be. We also wanted to know at what point the bailout agency should get out altogether, as the situation is so bad that the country will default for fundamental reasons, not for the sunspot³ reasons. It turns out that there's a range of debt where the bailout guarantees must become very large very quickly, almost to the point where this agency has to buy the entire newly issued debt of that country. A bit beyond that, it should get out completely though, because if the debt burden is too high to begin with, the country will default for fundamental reasons, even without the possibility of a buyer's strike. The lesson is that such an agency can help up to a point, but after that point, it should get out of it. The second lesson is that it has to do so at the right prices, taking into account that the country may still default due to fundamental reasons. The third lesson is that if the agency gets rid of this sunspot rollover risk problems, the yield will initially fall, but that then leads the country to borrow more and debt levels rise. To some degree, the default due to the coordination problems of a buyer's strike is replaced by fundamental default, because the country will have accumulated too much debt. The bailout agency eliminates the coordination problem equilibrium, but it will lower the default probabilities only somewhat. So if you want to get rid of default rates, that won't do the trick, but if you just want to get rid of the bad sunspot equilibrium, then this is something that may be reasonable to do. There are many more questions that one could ask, starting from this framework, and I hope I will get to think about them in the future.

– You probably have strong views on the current euro crisis. Do you have any thoughts you could share with us on this topic?

For full disclosure: my views certainly go beyond what one can solidly conclude based on serious research. But here they are. I don't quite like where the debate is going, I find it to be rather confused. Some say we have to save the euro. But what exactly does that mean? Duisenberg has been asked in the past what it means for the euro to fail. He pointed to keeping inflation stable as the single measuring stick. When people now talk about "saving the euro", I don't think that this is what they mean. Is it saving the financial system in the Eurozone then? That actually is part of the mandate of the ECB. Does "saving the euro" mean that you want to save countries from defaulting? Where is the connection? Does "saving the euro" mean you want to prevent countries from exiting the Eurozone? Why would it be so terrible if, say, Greece joins Denmark and other European nations as being outside the Eurozone? How is that endangering the euro? In any case, it would be nice if that got clarified: only then can one find the appropriate policy response. Here is one example. If you want to keep the currency stable, then it is probably a bad idea to print lots of euros and distribute them against bad collateral: this can create inflation down the road or losses for the central bank. So if you are really worried about a stable currency, if you use the measuring stick of *Duisenberg* (*Wim Duisenberg, first President of the ECB between 1998 and 2003 – the Editor.*), then that's not what you should be doing. But clearly that is what the ECB is doing, so *Draghi* (*Mario Draghi, President of the ECB since November 2011 – the Editor.*) and the ECB decision-makers apparently think about it in a different way. Do they have the financial system in mind; is that what they want to keep stable? I don't think so either. In the long-term refinancing operations, the ECB pretty much encouraged all the banks to purchase the debt of their own country. Now if you have a fragile bank in Greece, the last thing you ought to buy is Greek bonds. If you have a fragile bank in Spain, the last thing you ought to buy are Spanish bonds, right? You should encourage the bank to get rid of those Spanish bonds and buy German bonds instead, if you want to keep the bank stable! Instead, this is done to lower the yields on Spanish sovereign bonds and to prevent Spain from defaulting or from exiting the Eurozone. But seriously: would Spain or Greece wish to exit the Eurozone, if it came down to it? I don't think they would. I think it would be bad for Spain, I think it would be bad for Greece to get out of the Eurozone. They get a lot of transfers while they are in the Eurozone, and contracts would be written in terms of euro anyhow: they have no incentives to go out. The one country that has incentives to get out of the Eurozone is Germany, because it is guaranteeing and ultimately paying a lot of money to maintain the current situation. To me, that would be the end of the Eurozone and the end of the euro as we know it, if Germany decides to exit. So, it seems the ECB is playing with fire by starting to bail out Southern European countries, and bailing out the banking system there: this all could encourage a German exit. The ECB is in violation of the original treaties, it's a violation of the Maastricht treaty, and their policy is a violation of the dominant authority of parliaments on fiscal matters. Parliaments should set expenditure and taxes, not the European Central Bank. It could easily happen that the European Constitutional Court decides that the ECB is encroaching on the budgetary authority of the parliaments. It could lead to a situation where

³ Sunspot means that the triggers for interactions between economic agents' behaviour and, consequently, possible equilibria are random rather than fundamental events.

Germany has no choice but to exit, if the German Constitutional Court agrees that such a violation has taken place.⁴ So, if Draghi wants to save the euro, then that's not what he wants to happen. If Draghi wants to be on the safe side, he shouldn't play with fire here, but he is. So, clearly he has some rather different objective in mind. I described one piece of my research, where one can perhaps view bailouts and guarantees as a way to achieve a good equilibrium, ruling out the buyer's strike equilibrium. One can think of the ECB as being this large outside investor that can guarantee this outcome. If the ECB wants to make that argument, then they should be very clear about it. But then, they have to be very sophisticated, they have to be very careful. They have to make sure that the only thing they do is to rule out the sunspots. But giving handouts to banks that have gambled with their assets and then lost, or transferring money to countries that don't get their matters sorted out sets all kinds of bad incentives. You create moral hazard down the road. I believe that Spain was well on its way to try to get its fiscal house in order. But now the ECB says, don't worry; we'll buy your bonds. But then, politically, inside Spain, it is going to be impossible to argue for cuts because you know the ECB is going to buy the bonds if all else fails. Who in his right mind in Spain will now argue in favour of the necessary, but tough political choices, if an outside rescue is available? But somebody has to pay for that, these resources do not come for free. Personally, I am therefore in favour of going back to the original rules and to say: well, if a bank falls, let's not worry too much about it. We have a resolution mechanism for failing banks that has existed and worked for a long time. If you have a solvent, but illiquid bank, by all means lend to it, but if the bank is insolvent, you need to take it over, clean out the shareholders and bondholders, and see what you can do with the remaining assets, possibly finding a willing buyer. If a country is insolvent, you don't bail it out, you let it default. Default of a country is nothing terrible; it's not the end of the world. It happens. Investors that own these bonds lose money, but that is how markets work: sometimes you gain, sometimes you lose. If we indeed went back to the original rules and allowed such defaults, we would probably see a thunderstorm. It would be pretty bad for a while, but then the problems would clear out and we would continue with healthy banks, healthy fiscal balances, no looming threat of sort of a large debt purchase by the ECB and so forth. Then, everything would be fine again. A brief period in which things are pretty bad and then back to a good situation: to me, that sounds much better than to keep kicking the can down the road, creating all the moral hazard and keeping all those zombie banks alive. Look at Greece. They tried to do the Greek bailout, but it is clear that Greece is going to default again or that more money needs to be poured into it from the outside. Why? Do it once, do it right, get it over with, proceed to the future: that is my view.

– Maybe we can move back to your favorite research area. It's about recent efforts trying to improve DSGE models (broadly interpreted) using financial frictions and other types of frictions. Do you think this is the right way to go, preserving the core and fiddle with additional bells and whistles, or do you see something very different happening in the near future? Or should something very different happen?

I believe that one should let many flowers bloom. So whenever somebody comes up with an interesting new way to approach a problem, I'm excited. George Soros has created an Institute for New Economic Thinking. Good. I like new economic thinking. New economic thinking is always a good idea, that's what we ought to do as researchers. But it's hard, right? And, you know, just because something is new does not automatically mean it is good. So, what we really need is good new economic thinking. If somebody comes up with something new and fantastic, go for it. But while some of us are doing this, we should also see whether we can amend the approaches used so far. There was a reason it was successful: it may well be possible to fix it a bit, and that may be the better way forward. So, let some try this, let some try that and let's have a race and let's see what works best in the end. Currently, many people in the profession try to tackle this from many different angles. There are many approaches on the table, and that makes it fun for researchers, it makes it confusing for users of research, and certainly more confusing to the outside world, but there are lots and lots of approaches that people try for different questions.

– Do you see any of these new approaches having a chance to become as successful as the current paradigm?

The question of "success" always needs context. One is able to do a number of things reasonably well within the current paradigm, with the current set of models. These models don't live in some abstract space; the models always have a purpose. Economists are there to answer questions, and different economists answer different questions: therefore,

⁴ The interview was made in early August. The German Federal Constitutional Court gave the green light for the ECB's bailout fund, the European Stability Mechanism (ESM), in mid-September.

different models serve different questions and purposes. Some models are very useful for answering these questions, and terrible for answering some other questions. Our profession has been blamed for not seeing the 2008 crisis coming and journalists have blamed our models for being inadequate for predicting it. But often, that was not the aim or the purpose for these models in the first place. Perhaps professional forecasters should be blamed: forecasting is their job. Let's ask why they missed it! But academics like me are for most parts interested in thinking and explaining some observed phenomenon. I am not in the business of forecasting. Instead, I see the events that have taken place in 2008 and in 2010 and the interesting questions that arise from that. I may then go ahead and write down a model that answers these questions. Such a model may or may not be particularly helpful to institutions – and I think central banks are such institutions, or the IMF or the OECD – where the exercise is to think ahead what is going to happen. If these institutions need better models for their tasks, they might want to think about ways of enticing academics to help them there. So, here is an interesting question. If you could take a time machine, given that we know now, and then travel back to 2006, what would be the key tools or the key models that you would take along, what would be the key things to look at that would help you predict the events as they unfolded? I fear that even the recent financial-friction models wouldn't help much. Perhaps you would want to look at things like house price-rent ratios, price dividend ratios, or the ratio of credit to GDP: these could all be telltale signs. There may be things that build up to a point where they become very fragile when something potentially large could happen. This idea has been around for a long time, but we have not completely sorted that out within our leading models. The current slate of DSGE models is more suitable for ex-post reasoning. Researchers feed data into these DSGE models, like spreads on financial markets, and then some of these DSGE models interpret that as increasing financial frictions. At best, you can then analyse the consequences of that. But it is probably fairly impossible right now to predict, say, two years ahead of time that this increase in spreads is going to happen. So, you couldn't take one of the new models back to 2006 in your time machine and hope to be able to predict the emerging crisis a year later. Again, that is OK if what you are interested in is thinking about these facts afterwards as most academics do. It is not OK in an institution that tries to get ahead of the game. So, to answer your question, which approach will be successful or not in future: for that, we first have to be clear about the purpose, about what it is that we wish to achieve here, and what the approach and the model should be for. Perhaps it would be a good idea for central banks or the OECD to very precisely formulate what it is that they need. I believe they have the resources to do that, right? Then get academics; give them the small little rewards that they need to start thinking in those directions and hopefully better tools emerge.

– Macro modeling has been made dramatically more accessible by specialised software, including your own Toolkit and Dynare. Some argue that the ready availability of packaged code lowers the entry barrier too much, and leads to large numbers of mindless applications. Do you see this happening, and if yes, is it a problem?

You know, I wrote these "toolkit" programs a while back. I wrote them for myself and then posted them on the web, just in case others found them useful too. They became remarkably popular. Obviously, I was happy about that. Lots of people used this "toolkit", other people even developed it further and did ever more sophisticated things with them – good! I was thrilled. More recently, *Michel Juillard (Banque de France – the Editor)* in France developed Dynare. I think it is more of an open source software, so a number of people have played a role in developing that code. Dynare is more recent than my programs, and it can do many things that my "toolkit" programs cannot do. Great, that's technological progress! Personally, I can still do certain things with my programs more easily than in Dynare. Others only use Dynare and that is just fine too, of course. It certainly has lowered the entry barrier, and it's easy to do many things. The quality of your results depends on what you do with it, of course! Computer scientists sometimes say 'garbage in, garbage out'. If you put in a bad model, you get bad output, even if the output looks super-sophisticated. It is still the human input that matters most. Still, these tools are a fantastic achievement. It made macroeconomists more serious about data, made them more serious about estimation, and about solution methods and understanding macroeconomic dynamics. It elevated the level of the debate considerably.

– Are you interested in policy questions; are you involved with macroeconomic policymaking? Do you advise central banks in Europe or in the USA?

I have some sort of contract with the Bundesbank and with the Chicago Federal Reserve Bank, but I would not say that I advise them on policy making. It just means that I go there and hang out with the researchers and talk to them. Perhaps, I give a presentation of my research, or I talk with them about their research, and we talk about economics

and monetary policy in broad terms. The key policy makers are not involved there, though. I get the impression that a number of them do not keep much in touch with the researchers. A key exception is *Otmar Issing*, who was on the Executive Board of the European Central Bank from 1998 to 2006. He talked to academics quite a bit, I give him a lot of credit for opening the ECB up to the debate with the scientific community; he's a real hero in all of this. I don't know why policymakers do not do that more frequently. They are perhaps smart, they are certainly busy, and they have many things to do. But for many policy issues, it is key to think through the underlying economics. It is unclear to me whether they talk to economists much at all, but my impression is, they do not do it much. It would probably be helpful, if they did it more. It always puzzles me that many of the central banks, including the central bank of Hungary, have excellent and sophisticated economists on the research staff. They are in touch with academia, they have great analytical skills that strike me as very useful for the policy issues at hand, but somehow, these insights do not get used enough at the top level. In central banks, it works at least somewhat. In fiscal policy, I don't see that it is working at all; it really is hard to detect much meaningful interaction between fiscal policy makers and the economics research community. Some colleagues claim it works for labour market policy, but I remain sceptical. How economic wisdom and good economic analysis has a chance to get into policy is a mystery to me.

– You used to have a blog if I'm correct.

Yeah, I had a blog with the *Handelsblatt*, a German daily newspaper on matters of economics. From my perspective, it was a hobby, not my main activity. But I found it refreshing. I might read something in the newspaper about some economic policy, and I might think that maybe I have something to say on that as an economist. The blog was great for that. I wrote it up and two hours later, it is on the web and the world knows about it. It became too much of a chore for me to clean out spam comments: they kept appearing and I had to erase them, they had absolutely nothing to do with the blog content. It looked like robot programs posted them. Removing them required time. So at some point I just said, look, this has been fun, but let me stop here, and so the blog was closed. I guess it had some impact. At some point, in September 2008, I was very worried about a bank run in Germany and I made some rather clear-cut comments about that in my blog. Someone at *Handelsblatt* thought that this was too dangerous as a blog entry, and so they erased it. But the moment they erased this blog entry, readers noticed, the number of visits to my blog shot way up, and readers found a way to read the entry on some autostorage site or so. Erasing that entry made it actually very popular, and many more people read it than if *Handelsblatt* had not done anything. It was a fascinating lesson in Internet culture for me.

– Macroeconomics has been heavily criticised for not being able to predict the crisis. Do you think this criticism is justified? What do you think were the main problems with pre-crisis macro?

This question should really go to the professional forecasters. As an academic, I am not in the game of forecasting, it is not my aim. But even when one does warn, does one get heard? Let me mention one episode. In 2003, the economics unit within the European Commission organised a conference on the interplay between central banks and fiscal policy, and they commissioned me to write a paper on that. It was supposed to be an academic piece, but on the level where you could teach it to undergraduate students in economics or where someone with a bit of training in formal economics could read it. So, I wrote a paper called '*One Money, But Many Fiscal Policies in Europe: What are the Consequences?*' The conference papers were published in a conference volume and the paper was generally available on the web. The paper has two parts: let me talk about the second half of it. The second part asked: what will happen, if a member country of the European Monetary Union goes into sovereign default or where such a sovereign default becomes a serious possibility? What should the European Central Bank do? What are some of the issues that one needs to think through then? I didn't have enough fantasy to think this through entirely, plus there was a deadline to finish the paper. But at least, I raised the issue, I presented it at the conference in Brussels, and there were research people somewhat close to policy in the ECB and other institutions seeing it being presented. So, if any of the policy people would have thought that this is an issue worth thinking more, or if any journalist had picked it up at that time and figured that this is worthy of more debate, there could have been some follow-up. But there was not, there was zero interest in that issue then. What I learned from this is that as an academic, if you warn of bad developments to come while the sun shines, you are Cassandra and it is very likely that you will simply be ignored. I surely was not the only one with such an experience.

– It has been argued by Peter Howitt that the connection between central bank practice and academic macro research is much weaker than academic economists would like. What are your views on this, and how should interaction be improved?

I think that central banks are actually doing a pretty good job here. Sure, things could be even better, but central banks in particular have gone a long way. 30 years ago, I believe they were not particularly sophisticated in terms of the academic debate. Nowadays, many central banks have high-level research staff, who are also part of the academic community, write research papers, read research papers, and interact with the academic research community. There is a lot of interaction between the academic research community and the central bank research community. This in turn has led to a substantial shift in the questions that macro researchers are interested in. For example, there is lots of research on the effects of monetary policy shocks, and one of the reasons is that central banks were interested in that research. By contrast, there is a lot less research on the many issues in fiscal policy. Researchers there have not received the same kind of attention by policymakers, and may have turned to other issues as a result. I genuinely believe that fiscal policy could be improved considerably, if there was the same level of interaction there. Why not have research staffs in finance ministries and economics ministries like they exist in central banks, and give them the time and resources to be part of the academic research community while also doing their work for the ministries? The next tricky part, of course, is how to utilise this economic expertise inside for actual policymaking. I do not know enough about that process. I often think that it would be good for high-level policymakers to have a PhD in economics themselves and to actually have, say, published some papers in economics. With that, they have an appreciation for how research works and how to make the best use of their research staff. There is no push button and you get the perfect answer to some current issue. Rather, it is an ongoing communication that can work well. That helps to sharpen the issues and helps identify the key forces at work. The leadership of central banks underutilises that resource too. But if you compare that to fiscal policy, to labour market policy, the difference looks like night and day to me. Central banks should really be the role models for other policy areas.

– You spent many years in Europe before moving to the United States. What is the current state of the profession in Europe in your view? Is there a convergence across the Atlantic, or is the USA still the place to be?

You know, there are many wonderful economists in Europe, there are some very good departments in Europe, but it's still a lot thinner in Europe overall. The density of top-notch economists in the United States is just amazing. Sometimes it feels to me that if you take all the macroeconomists that are in the Chicago area and compare them to the macroeconomists in all of Europe taken together, that the greater-Chicago crowd might hold up well in terms of insight and research activities. Perhaps then, Chicago is all of Europe packed in one city in terms of macroeconomic research. It is terrific to be part of that community. In Europe, the CEPR (*Centre for Economic Policy Research – the Editor*) has done a great job in getting people together, but it is always a challenge. There may still be a long way in Europe to go. The reasons are many. But it would be entirely feasible for Europe to be on par or even ahead. Europe is as rich as the United States, and there probably is a more fertile climate for intellectual debates here. I enjoyed living in Europe, and many European-born economists working in the United States do too. So, there is a lot of potential in Europe, genuine opportunities. Some universities have become very entrepreneurial and make use of that.

– Any other thoughts?

I think that's it. It's the first time that I am at the central bank of Hungary; it's an impressive place, and I wish you much success. I spoke to many people here, I found them to be very insightful and interesting, and I really enjoyed being here. I am very grateful for the invitation.

Appendix

MNB BULLETIN ARTICLES (2006–2012)

7th year, issue 3 (October 2012)

DIVÉKI, ÉVA AND DÁNIEL LISTÁR (2012): Better safe than sorry: views of the Hungarian public on the security of payment instruments

FELCSER, DÁNIEL AND KRISTÓF LEHMANN (2012): The Fed's inflation target and the background of its announcement

HOLLÓ, DÁNIEL (2012): Identifying imbalances in the Hungarian banking system ('early warning' system)

KOROKNAI, PÉTER AND RITA LÉNÁRT-ODORÁN (2012): Developments in external borrowing by individual sectors

SZALAI, ZOLTÁN (2012): A crisis of crisis management? Debates over fiscal adjustments in the European Monetary Union

STEPANCHUK, SERHIY (2012): 11th Annual Macroeconomic Policy Research Workshop at MNB: Microeconomic Behavior and its Macroeconomic Implications During the Financial Crisis

Interview with Fabio Canova

7th year, issue 2 (June 2012)

DIVÉKI, ÉVA (2012): Card or print? How to issue cafeteria vouchers electronically?

FÁBIÁN, GERGELY AND RÓBERT MÁTRAI (2012): Unconventional central bank instruments in Hungary

LEHMANN, KRISTÓF (2012): International experiences with unconventional central bank instruments

PULAI, GYÖRGY AND ZOLTÁN REPPA (2012): The design and implementation of the MNB's euro sale programme introduced in relation to early repayments

RÁCZ, OLIVÉR MIKLÓS (2012): Using confidence indicators for the assessment of the cyclical position of the economy

TURJÁN, ANIKÓ AND JUDIT BROSCH (2012): Single Euro Payments Area (SEPA): Full speed ahead!

7th year, issue 1 (February 2012)

KISS M., NORBERT AND ZOLTÁN MOLNÁR (2012): How do FX market participants affect the forint exchange rate?

RABITSCH, KATRIN (2012): 10th Annual Macroeconomic Research Workshop at MNB: Fiscal Rebalancing, Public Debt, and its National and Global Implications

SZIGEL, GÁBOR AND PÉTER FÁYKISS (2012): The effect of indebtedness on the financial and income position of Hungarian households

6th year, issue 3 (October 2011)

ACZÉL, ÁKOS AND DÁNIEL HOMOLYA (2011): Risks of the indebtedness of the local government sector from the point of view of financial stability

BENCZÜR, PÉTER, GÁBOR KÁTAY, ÁRON KISS, BALÁZS REIZER AND MIHÁLY SZOBOSZLAI (2011): Analysis of changes in the tax and transfer system with a behavioural microsimulation model

HOSSZÚ, ZSUZSANNA (2011): Pre-crisis household consumption behaviour and its heterogeneity according to income, on the basis of micro statistics

KOCSIS, ZALÁN AND DÉNES NAGY (2011): Variance decomposition of sovereign CDS spreads

KOROKNAI, PÉTER AND RITA LÉNÁRT-ODORÁN (2011): The role of special purpose entities in the Hungarian economy and in statistics

PÁLES, JUDIT AND DÁNIEL HOMOLYA (2011): Developments in the costs of external funds of the Hungarian banking sector

6th year, issue 2 (June 2011)

HOMOLYA, DÁNIEL (2011): Operational risk and its relationship with institution size in the Hungarian banking sector

HORVÁTH, ÁGNES, CSABA KÖBER AND KATALIN SZILÁGYI (2011): MPM – The Magyar Nemzeti Bank’s monetary policy model

ODOR, LUDOVIT AND GÁBOR P. KISS (2011): The exception proves the rule? Fiscal rules in the Visegrád countries

6th year, issue 1 (April 2011)

ANTAL, JUDIT AND ÁRON GERESEN (2011): Foreign reserve strategies for emerging Economies – before and after the crisis

ERHART, SZILÁRD AND ANDRÁS KOLLARIK (2011): The launch of HUFONIA and the related international experience of overnight indexed swap (OIS) markets

HELMECZI, ISTVÁN NÁNDOR AND GERGELY KÓCZÁN (2011): On trade vouchers called “local money”

KÉKESI, ZSUZSA AND GÁBOR P. KISS (2011): The reversal of the pension reform 1998 from a short-term perspective

5th year, issue 4 (December 2010)

HOFFMANN, MIHÁLY AND GÁBOR P. KISS (2010): From those lying facts to the underlying deficit

KRUSPER, BALÁZS AND GÁBOR PELLÉNYI (2010): Impacts of fiscal adjustments in Western European countries on the Hungarian economy

MOLNÁR, ZOLTÁN (2010): About the interbank HUF liquidity – what does the MNB’s new liquidity forecast show?

SZOMBATI, ANIKÓ (2010): Systemic level impacts of Basel III on Hungary and Europe

5th year, issue 3 (October 2010)

BALÁS, TAMÁS AND MÁRTON NAGY (2010): Conversion of foreign currency loans into forints

FÁBIÁN, GERGELY, ANDRÁS HUDECZ AND GÁBOR SZIGEL (2010): Decline in corporate lending in Hungary and across the Central and East European region during the crisis

GEREBEN, ÁRON AND ISTVÁN MÁK (2010): Potentials and limitations of non-governmental forint-denominated bond issues by non-residents

KISS, GERGELY (2010): Experiences of European crisis management: the reform of economic policy coordination

KISS, GÁBOR P. AND ZOLTÁN REPPA (2010): Quo vadis, deficit? How high the tax level will be when the economic cycle reverses?

VARGA, LÓRÁNT (2010): Introducing optional reserve ratios in Hungary

5th year, issue 2 (June 2010)

CSERMELY, ÁGNES AND ZOLTÁN SZALAI (2010): The role of financial imbalances in monetary policy

FELCSER, DÁNIEL AND GYÖNGYI KÖRMENDI (2010): International experiences of banking crises: management tools and macroeconomic consequences

HABÁNY, LEVENTE AND ANIKÓ TURJÁN (2010): Channelling government securities redemption into VIBER and its effects on payment systems and its participants

KISGERGELY, KORNÉL (2010): Carry trade

5th year, issue 1 (March 2010)

BODNÁR, KATALIN (2010): Household consumption expenditures and the consumer confidence index

BÓDI-SCHUBERT, ANIKÓ (2010): Factors behind high cash usage in Hungary

KREKÓ, JUDIT AND MARIANNA ENDRÉSZ (2010): The role of foreign currency lending in the impact of the exchange rate on the real economy

4th year, issue 4 (December 2009)

GYURA, GÁBOR AND ANIKÓ SZOMBATI (2009): Systemic risk in focus – New directions of financial supervision at home and abroad

KISS M., NORBERT AND ISTVÁN MÁK (2009): Developments in sovereign bond issuance in the Central and Eastern European region after the Lehman collapse

SIMON, BÉLA (2009): The role of cash in corporate financial management – Where are petty cash holdings high?

VONNÁK, BALÁZS (2009): Risk premium shocks, monetary policy and exchange rate pass-through in small, open countries

4th year, issue 3 (October 2009)

BALOGH, CSABA (2009): The role of MNB bills in domestic financial markets. What is the connection between the large volume of MNB bills, bank lending and demand in the government securities markets?

HOLLÓ, DÁNIEL (2009): Risk developments on the retail mortgage loan market

KÉZDI, GÁBOR AND ISTVÁN KÓNYA (2009): Wage setting in Hungary: evidence from a firm survey

KARÁDI, PÉTER (ED.) (2009): Rethinking Business Cycle Models – Workshop at the MNB

4th year, issue 2 (July 2009)

HOMOLYA, DÁNIEL (2009): The impact of the capital requirements on operational risk in the Hungarian banking system

LESZKÓ, ERIKA (2009): Rounding is not to be feared

MUNKÁCSI, ZSUZSA (2009): Who exports in Hungary? Export orientation by corporate size and foreign ownership, and the effect of foreign ownership on export orientation

PINTÉR, KLÁRA AND GYÖRGY PULAI (2009): Measuring interest rate expectations from market yields: topical issues

VARGA, LÓRÁNT (2009): Hungarian sovereign credit risk premium in international comparison during the financial crisis

4th year, issue 1 (May 2009)

BAKONYI, ÁKOS AND DÁNIEL HOMOLYA (2009): Backtesting the efficiency of MNB's Lending Survey

BAKSAY, GERGELY AND GÁBOR P. KISS (2009): Act one, act first – the law on fiscal responsibility

MÁK, ISTVÁN AND JUDIT PÁLES (2009): The role of the FX swap market in the Hungarian financial system

KISS, GÁBOR P. AND RÓBERT SZEMERE (2009): Apples and oranges? A comparison of the public expenditure of the Visegrád countries

3rd year, issue 3 (December 2008)

FISCHER, ÉVA (2008): Challenges of financial integration in the Central and East European region

KOROKNAI, PÉTER (2008): Hungary's external liabilities in international comparison

ODORÁN, RITA AND BALÁZS SISAK (2008): Cash demand of the Hungarian economy – is the shadow economy still running smoothly?

REPPA, ZOLTÁN (2008): Interest rate expectations and macroeconomic shocks affecting the yield curve

SZÜCS, ADRIEN (2008): The 200 forint denomination will be a coin

3rd year, issue 2 (September 2008)

KARVALITS, FERENC (2008): Challenges of monetary policy – a global perspective and the Hungarian situation

DÁVID, SÁNDOR (2008): The Single Euro Payments Area

HOMOLYA, DÁNIEL AND GÁBOR SZIGEL (2008): Lending to local governments: Risks and behaviour of Hungarian banks

JUHÁSZ, RÉKA (2008): The optimal rate of inflation and the inflation target: international experience and the Hungarian perspective

3rd year, issue 1 (April 2008)

HORNOK, CECÍLIA, ZOLTÁN M. JAKAB AND GÁBOR P. KISS (2008): 'Through a glass darkly': Fiscal expansion and macroeconomic developments, 2001–2006

KOMÁROMI, ANDRÁS (2008): The structure of external financing: Is there a reason to worry about financing through debt?

KREKÓ, JUDIT AND GÁBOR P. KISS (2008): Tax evasion and tax changes in Hungary

NAGY, MÁRTON AND VIKTOR E. SZABÓ (2008): The sub-prime crisis and its impact on the Hungarian banking sector

PÁLES, JUDIT AND LÓRÁNT VARGA (2008): Trends in the liquidity of Hungarian financial markets – What does the MNB's new liquidity index show?

2nd year, issue 2 (November 2007)

CSERMELY, ÁGNES AND ANDRÁS REZESSY (2007): The theory and practice of interest rate smoothing

DELIKÁT, ANNA (2007): Role of financial markets in monetary policy

HOLLÓ, DÁNIEL (2007): Household indebtedness and financial stability: Reasons to be afraid?

SÁNTA, LÍVIA (2007): The role of central banks in crisis management – how do financial crisis simulation exercises help?

TÓTH, MÁTÉ BARNABÁS (2007): Monetary policy rules and a normative approach to the central bank's objective function

ZSÁMBOKI, BALÁZS (2007): Impacts of financial regulation on the cyclicity of banks' capital requirements and on financial stability

2nd year, issue 1 (June 2007)

BALÁS, TAMÁS AND CSABA MÓRÉ (2007): How resilient are Hungarian banks to liquidity shocks?

GÁL, PÉTER (2007): Unfavourable investment data – risks to economic growth?

KISS M., NORBERT AND KLÁRA PINTÉR (2007): How do macroeconomic announcements and FX market transactions affect exchange rates?

KOMÁROMI, ANDRÁS (2007): The effect of the monetary base on money supply – Does the quantity of central bank money carry any information?

1st year, issue 2 (December 2006)

GÁBRIEL, PÉTER AND KLÁRA PINTÉR (2006): Whom should we believe? Information content of the yield curve and analysts' expectations

GÁBRIEL, PÉTER AND ÁDÁM REIFF (2006): The effect of the change in VAT rates on the consumer price index

GEREBEN, ÁRON AND NORBERT KISS M. (2006): A brief overview of the characteristics of interbank forint/euro trading

JAKAB, ZOLTÁN M. (2006): Consequences of global imbalance corrections for Hungary

REZESSY, ANDRÁS (2006): Considerations for setting the medium-term inflation target

SZÉPLAKI, VALÉRIA (2006): Reform of the Hungarian corporate insolvency regulation and its financial stability aspects

1st year, issue 1 (June 2006)

BODNÁR, KATALIN (2006): Survey evidence on the exchange rate exposure of Hungarian SMEs

CSÁVÁS, CSABA AND LÓRÁNT VARGA (2006): Main characteristics of non-residents' trading on the foreign exchange and government bond markets

HOLLÓ, DÁNIEL AND MÁRTON NAGY (2006): Analysis of banking system efficiency in the European Union

KISS, GERGELY (2006): Fast credit growth: equilibrium convergence or risky indebtedness?

PÁRKÁNYI, BALÁZS (2006): Myths and Maths: Macroeconomic Effects of Fiscal Adjustments in Hungary

Publications of the Magyar Nemzeti Bank

All publications of the Magyar Nemzeti Bank on the economy and finance are available on its website at <http://english.mnb.hu/Kiadvanyok>. From 2009, the publications have been published only in electronic format.

Papers

MNB Bulletin / MNB-szemle

http://english.mnb.hu/Root/ENMNB/Kiadvanyok/mnben_mnbszemle

http://english.mnb.hu/Kiadvanyok/mnben_mnbszemle/mnben_szemle_cikkek

In Hungarian and English; published three or four times a year.

The aim of the short articles published in the Bulletin is to provide regular and readily comprehensible information to professionals and the public at large about underlying developments in the economy, topical issues and the results of research work at the Bank, which are of interest to the public. Private sector participants, university professors and students, analysts and other professionals working at central banks and international organisations may find the Bulletin an interesting read.

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http://english.mnb.hu/Kiadvanyok/mnben_muhelytanulmanyok

In Hungarian and/or English; published irregularly.

Economic analyses related to monetary policy decision making at the Magyar Nemzeti Bank are published in the Occasional Paper series. The aim of the series is to enhance the transparency of monetary policy. Typically, the papers present the results of applied, practical research, review the technical details of projection work and discuss economic issues arising during the policy making process.

MNB Working Papers

http://english.mnb.hu/Kiadvanyok/mnben_mnbfuzetek

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The series presents the results of analytical and research work carried out in the Bank. The papers published in the series may be of interest mainly to researchers in academic institutions, central banks and other research centres. Their aim is to encourage readers to make comments which the authors can use in their further research work.

Regular publications

Quarterly report on inflation / Jelentés az infláció alakulásáról

In Hungarian and English; published four times a year.

Report on financial stability / Jelentés a pénzügyi stabilitásról

In Hungarian and English; published twice a year.

Report on payment systems / Jelentés a fizetési rendszerről

In Hungarian and English; published once a year.

Annual report: Business report and financial statements of the Magyar Nemzeti Bank / Éves jelentés: A Magyar Nemzeti Bank adott évről szóló üzleti jelentése és beszámolója

In Hungarian and English; published once a year.

Féléves jelentés: Beszámoló az MNB adott félévi tevékenységéről (Semi-annual report: Report on the MNB's operations in a given half-year)

Only in Hungarian; published once a year.

Időközi jelentés: Beszámoló az MNB adott negyedévi tevékenységéről (Interim report: Report on the MNB's operations in a given quarter)

Only in Hungarian; published twice a year.

Analysis of the convergence process / Elemzés a konvergenciafolyamatokról

In Hungarian and English; published yearly or biennially.

Senior loan officer opinion survey on bank lending practices / Felmérés a hitelezési vezetők körében a bankok hitelezési gyakorlatának vizsgálatára

In Hungarian and English; published four times a year.

Public finance review / Elemzés az államháztartásról

In Hungarian and English; published three or four times a year.

In addition to those listed above, the Bank also occasionally publishes other materials.

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