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The Phillips curve – history of thought and empirical evidence

Szabolcs Szentmihályi – Balázs Világi

The Phillips curve is one of the best known, most discussed and most often used macroeconomic relationships. As a result of the severe, prolonged global recession that unfolded in the wake of the 2007–2008 financial crisis, special attention was paid to the issue of the slope of the curve. In spite of the protracted recession, the decline in inflation remained moderate, and although it reached a much lower level than before, permanent deflation did not occur.

According to most of the empirical studies, flattening of the Phillips curve was observed in the past decades, i.e. the coefficient of the output gap declined significantly. Although this process started prior to the crisis, the crisis amplified it considerably. The main underlying reasons for these developments are attributable to changes in corporate pricing behaviour and to the process of globalisation, as well as to the fact that downward nominal wage rigidities made the Phillips curve even flatter in the low inflation environment following the crisis.

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1. Introduction

The Phillips curve is one of the best known, most discussed and most often used macroeconomic correlations. The Phillips curve captures the correlations between inflation and unemployment as well as between inflation and the output gap. From the views of various schools of economic thought, various Phillips curves may be obtained, which have completely different economic policy implications: while according to the new classical approach, monetary policy is able to influence only inflation and not the real economy, according to the various Keynesian approaches economic policy is able to have an effect on both, but not independently of one another.

In this study, following the discussion of the background of the Phillips curve in terms of history of thought, we examine what characteristics the Phillips curve has empirically, how the crisis of the past period affected the properties of the curve and what consequences it has concerning monetary policy.

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2. The Phillips curve in the economics of the 1950s and 1960s

The equation that captures the correlation between developments in inflation and the real economy can be traced back historically to the study by *Phillips* (*1958*). The original article contains an empirical estimation for UK data between 1861 and 1957. The author found stable correlation between nominal wage inflation and unemployment; the higher the wage inflation, the lower the unemployment. Later, *Samuelson and Solow* (*1960*) found a similar correlation in the case of the United States, although they documented a weaker relation than Phillips.

Whether a similar relationship between inflation and unemployment follows from the negative relation between wage inflation and unemployment is important from two aspects. Firstly, the original Keynesian theory did not deal with the mechanism of price adjustment, and thus the Phillips curve generalised for price inflation could be interpreted as the 'missing equation'. Secondly, for the activist economic policy typical of the period, a stable relation between inflation and unemployment would have provided an opportunity to set unemployment to a desired level by managing aggregate demand, although at the price of raising inflation to a level higher than before, if necessary.

The majority of economists from that period tended to interpret the Phillips curve as the relation between price inflation and unemployment. Although there had been doubts in connection with that from the very beginning, Samuelson and Solow themselves also cautioned in this regard. Phillips found the relation for a period when inflation was relatively low, and there was no guarantee that the relation would remain stable in the case of higher inflation as well.

3. New classical criticism of the Phillips curve

In their influential studies, *Friedman* (*1968*) and *Phelps* (*1968*) criticised the theoretical approach that absolutised the stable Phillips curve and also criticised the economic policy based on that. That criticism was theoretical, but some years after its publication, economic developments confirmed their conjecture. The essence of their criticism is that the empirical Phillips curve is far from being as stable as thought, because an important variable that cannot be observed (or is difficult to observe) is missing from the correlation: inflation expectations.

According to their train of thought, the only reason why monetary policy is able to increase the level of employment by generating inflation is that employees' inflation expectations underestimate inflation, and thus overestimate their real wages. If, as a result of monetary policy easing, inflation grows faster than nominal wages, it is worthwhile for companies to use more working hours for production, which adds to real economic activity and employment. At the same time, due to

their inaccurate inflation expectations, employees do not perceive that their real wages are declining, and therefore they are ready to do additional work.

However, this outcome is not the final state of equilibrium. Employees gradually adjust their inflation expectations, perceive that higher nominal wages do not mean higher real wages, enforce higher nominal wages, and thus real output returns to the original position. Accordingly, the result of activist economic policy is that inflation is higher, but real output is unchanged in the long run.

In summary, over the long term, monetary policy is unable to stimulate the real economy by generating inflation. The real economy and unemployment have a natural rate determined by technological progress and the institutional environment. The real economy can be diverted from its natural rate in the short run by generating surprise inflation, but with the adjustment of expectations, the economy returns to its natural rate in the long run. If the output gap is defined as the deviation of real GDP from its natural rate, based on the above, in the output gap–inflation plane the long-term relation between them is described by a vertical straight line. Therefore, according to the theory of Friedman and Phelps, the Phillips curve is vertical over the long term.

In the early 1970s, the empirical Phillips curve, which had been believed to be stable, really collapsed in the United States. This was the so-called stagflation period. At that time, economic growth did not accelerate, in spite of the high inflation. This resulted in a considerable increase in the credibility of the argumentation of Friedman and Phelps.

It was the time when the new classical school, which is even more radical than them, became included in the mainstream of economics. Their thoughts are summarised in the inspiring study by *Lucas* (*1973*). The new classical school accepts Friedman's argumentation, but has an extreme hypothesis with regard to expectations. In their opinion, expectations are rational. Consequently, expectations adjust themselves to the changed economic policy immediately, and not in the long run. While with Friedman and Phelps it is possible for the economy to deviate from its natural rate through surprise inflation, with rational expectations monetary policy is unable to cause surprise inflation, and thus it is impossible to deviate from the natural rate even in the short run. Monetary policy is practically ineffective.

Formally, the relation between inflation and real economy is expressed by the following new classical Phillips curve:

$$\pi_t = \pi_t^e + by_t + \varepsilon_t, \qquad (1)$$

where y_t is the output gap in period t, b is a positive parameter, π_t is inflation, π_t^e means the inflation expectations, and ε_t is a random error term. Since, according to the rational expectations hypothesis, economic agents cannot systematically

make mistakes upon creating the expectations, the deviation of π_t^e from π_t can only be a random variable with zero expected value, which is independent of economic policy. In other words, according to the new classical school, the Phillips curve is vertical already in the short run. Although monetary policy may influence the rate of inflation, it has no impact on real economy. Only random factors that are independent of monetary policy have an effect on the output gap.[1]

4. The new Keynesian Phillips curve

As discussed in the previous section, based on the rational expectations hypothesis, new classical economics claimed that the Phillips curve is vertical in the short run as well, and as a result, monetary policy does not have an impact on real output. However, soon after the appearance of the new classical school, several authors pointed out that even if we accept the rational expectations hypothesis, the conclusion corroborating the ineffectiveness of monetary policy is only true if we assume that prices and wages are flexible, i.e. prices and wages react to the changes in demand and supply factors immediately.

However, in the case of sticky prices and wages the ineffectiveness of monetary policy cannot be proven. Prices and wages are sticky if they are fixed for a longer period of time, and under certain conditions they remain unchanged even if demand or supply changes. *Fischer* (*1977*) and *Taylor* (*1980*) showed that if prices/wages are fixed for at least two time periods (quarters), monetary policy is able to influence the real economy.

Calvo (*1983*) prepared a similar model, which, as it can be handled well technically, became the basis of the new Keynesian dynamic stochastic general equilibrium (DSGE) models, which became popular starting from the 1990s. The so-called new Keynesian Phillips curve can be deduced from Calvo's model. The special feature of the new Keynesian Phillips curve is that although it is based on rational expectations, trade-off still exists between output and inflation in the short run. In the long run, however, monetary policy becomes ineffective in the new Keynesian models as well, because in the case of an arbitrary monetary policy action, prices gradually adjust themselves to the changed situation.

For a more accurate understanding of the above, it is worth looking at Calvo's model in more detail. The fundamental assumption of the model is that a random process regulates the number of time periods during which a given firm sets the price of its product. Let γ be the probability that a given company's current output price remains valid in the next time period as well. The greater γ, the stickier the

[1] Similar argumentation can be applied to any economic policy that is based on influencing aggregate demand. Accordingly, it can be applied to fiscal policy as well. However, it is not valid in the case of economic policies that influence structural factors and aggregate supply. Consequently, even in the new classical case it cannot completely be stated in general that economic policy is ineffective.

prices. Accordingly, the probability that the given company will set a new price in the next period is (1–*γ*). We assume that *γ* does not depend on since when the current price has been valid.

It follows from the above that if a firm sets the price of its product at a given time *t*, the optimally determined price is described by the following (log-linearised) formula:

$$p_t = \left(1-\beta\gamma\right)\sum_{i=0}^{\infty}\left(\beta\gamma\right)^i MC_{t+i}, \qquad (2)$$

where 0 < β < 1 is the discount factor of the owner of the company. According to the above expression, if a firm sets a new price (p_t) at date *t*, in the case of an optimum choice the new price equals the weighted sum of the current and future expected marginal costs (MC_{t+i}), where the weight of an item declines with the distance in time it refers to. The weights are the functions of parameters β and *γ*. If *γ* = 0, i.e. pricing is flexible, we obtain the price = current marginal cost formula, which is a well-known formula of standard microeconomics. The above price formula of the Calvo model is its generalisation: as the price determined at date t will probably remain valid in the future as well, it is optimal if it is the function of not only the current but also of the future expected marginal costs. However, the further a future date, the less probable that the price chosen now will be valid then. Therefore, the expected marginal costs of later dates have smaller and smaller weights in the formula.

It can be demonstrated that if there are similar firms in the economy, and they set their prices according to the Calvo model, and the same *γ* applies to all of them, the following relationship will be true for aggregate inflation:

$$\pi_t = \beta\pi^e_{t+1} + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\gamma}\omega mc_t + \varepsilon_t, \qquad (3)$$

where π_t is inflation at date t, π^e_{t+1} is the expectation for inflation at time *t+1*, mc_t is the real marginal cost (nominal marginal cost divided by the price level), while *ω* positive parameter measures to what extent the optimum price of a given company depends on aggregate variables and to what extent on the relative position of the competitors' prices.[2] If the choice of the optimum price of the company primarily depends on aggregate factors, the value of *ω* is high, but if the position of competitors is also important, the value of *ω* is relatively low.[3]

The importance of formula (*3*) is that it establishes a relation between real marginal cost, which characterises the state of the real economy, and developments in

[2] The findings of *Rotemberg* (*1982*; *1983*) are similar on the basis of a different model, where the cost of the price change is a quadratic function of the size of the price change.

[3] According to the terminology that is often used in literature, ω is the index of the degree of strategic complementarity.

inflation. In this sense it can be considered a quasi Phillips curve, even if the output gap or unemployment is not among the variables.

The economic interpretation of equation (*3*) is worth thinking over in an intuitive manner. Equation (*3*) is obtained by aggregating and rearranging equation (*2*), which represents the pricing behaviour of individual firms. According to equation (*2*), in the case of sticky prices, expectations for future marginal costs also matter upon determining the price. In the aggregate equation (*3*) derived from it, these expectations are represented in a compact form by the term π^{e}_{t+1}.

The real marginal cost sensitivity of the developments in inflation, i.e. the slope of the quasi Phillips curve (*3*), depends on the degree of price stickiness, i.e. γ. The intuitive explanation for this is as follows: if pricing is nearly flexible, i.e. γ is close to 0, the weight of the terms concerning the future is low in formula (*2*). Therefore, if the current marginal cost changes, the new prices of firms that are preparing for repricing will strongly react to the change in the marginal cost. In addition, if prices are flexible, many firms reprice their products at all points in time. The result of these two impacts is that the aggregate price index, and thus inflation as well, will react strongly to the change in the aggregate real marginal cost.

By contrast, if prices are very sticky, i.e. γ is close to 1, the weight of the current marginal cost in formula (*2*) is relatively low, and the firms that are changing their prices react to the changing of the current marginal cost only slightly when determining the new price. Moreover, in this case, only a few firms want to change prices at any time. As a result, inflation will also react modestly to the change in the aggregate real marginal cost.

Summarising the above, the stickier the prices, the smaller the coefficient of the real marginal cost, i.e. the flatter the quasi Phillips curve. In other words, the coefficient of the real marginal cost is monotonously declining in γ.

In addition to price stickiness, parameter ω also affects the slope of the quasi Phillips curve. Intuitively, this is also easy to explain. If the decisions of the optimally repricing firms are fundamentally determined by aggregate economic developments and not by the competitors' behaviour, i.e. if the value of parameter ω is high, new individual prices, and thus inflation as well, react strongly to the aggregate real marginal cost. In contrast, if ω is low, i.e. the competitors' prices are also important for those who choose new prices, they take into account that, due to sticky prices, some competitors do not change their prices, and therefore they also take a smaller step as a response to the changes in aggregate economic indicators (for example, they increase their prices to a lesser extent, to prevent their consumers from preferring the competitors). Consequently, in this case the reaction of inflation to the aggregate real marginal cost is relatively weak.

The real marginal cost included in equation (*3*) can be defined as follows:

$$mc_t = \left(1-\alpha\right)\left(\chi_w w_t + \chi_z z_t + \chi_x x_t - A_t\right) + \alpha p_t^m, \qquad (4)$$

where w_t is the real wage, z_t is the real rental rate of capital, x_t is the volume of the company's real output, and A_t is the measure of productivity, whereas p_t^m is the real price of imported inputs, and α, χ_w, χ_z, χ_x are non-negative parameters that depend on the production function.

The quasi Phillips curve represented by formula (*4*) can be converted into a Phillips curve in the traditional sense. Let us assume that $\alpha = 0$, i.e. it is a closed economy. Then, under certain conditions, equation (*3*) can be expressed with the help of the output gap,

$$\pi_t = \beta\pi_{t+1}^e + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\gamma}\omega\kappa y_t + \varepsilon_t \qquad (5)$$

where y_t is the output gap and κ is a positive parameter that depends on the wage elasticity of labour supply and the preferences of the representative household.

If it is not a closed economy, marginal cost (*4*) can be approximated by the expression $mc_t = \kappa\left(1-\alpha\right)y_t + \alpha p_t^m$. Using this, the quasi Phillips curve can be expressed as follows:

$$\pi_t = \beta\pi_{t+1}^e + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\gamma}\omega\left[\kappa\left(1-\alpha\right)y_t + \alpha p_t^m\right] + \varepsilon_t \qquad (6)$$

In the literature, formula (*5*) is called new Keynesian Phillips curve, but below we refer to expression *(6)* as well by using this name.

The main features of the new Keynesian Phillips curve are as follows:

i. Firstly, *unlike* in the new classical case, monetary policy is able to have an impact on the real economy through inflation in the short run. In the new classical Phillips curve, the output gap depends on the difference between π_t and π^e_t, and if rational expectations are assumed, the deviation of inflation at date *t* of time from the relevant expectation can only be caused by unforeseeable shocks that are independent of economic policy. By contrast, in the new Keynesian Phillips curve, the output gap depends on the difference between the expectations concerning *current* (π_t) and *future* (π^e_{t+1}) inflation. And the difference between the two may differ in the short run even with rational expectations, and this difference may be influenced not only by random shocks, but by monetary policy as well. If economic policy changes, and according to economic agents' expectations future inflation will deviate from the current inflation, exactly

as a result of the changed monetary policy, according to the new Keynesian Phillips curve it will have an impact on the real economy as well.

ii. Secondly, in the long run, the effect of inflation on the real economy is neutral, *like* in the new classical case. Namely, with rational expectations (if certain stability conditions exist), in the case of any shock, following the occurrence of the shock, π_t and π^e_{t+1} converge to the same value; therefore, in the long run they will not have an effect on the output gap.

iii. Thirdly, the slope of the Phillips curve, i.e. the coefficient of the output gap, depends on the degree of price stickiness. The stickier the prices (i.e. the greater γ), the flatter the Phillips curve. A flatter Phillips curve implies that the same change in the real economy has a lower impact on inflation. However, if prices are flexible, i.e. $\gamma = 0$, the Phillips curve will be vertical in the short run as well, i.e. $y_t = 0$ in expected value. Consequently, we are back to the new classical case, in which monetary policy is unable to influence the real economy.

The intellectual importance of the new Keynesian Phillips curve is that the expectations were successfully integrated in the theory in such a manner that it is in harmony with the widespread opinion that monetary policy is able to influence the real economy. However, it is important to note that the new Keynesian Phillips curve is basically a supply relation. Accordingly, the behaviour of the economy cannot be described precisely with the help of the Phillips curve alone. It has to be complemented with aggregate demand relations and a monetary policy rule.

However, the form of the new Keynesian Phillips curve represented by equations (*5*) and (*6*) is not completely problem free. Namely, its feature that it does not contain a backward-looking inflation term (π_{t-1}) is hard to reconcile with empirical experiences concerning the developments in inflation, i.e. that inflation is a slowly changing and rather persistent process.

This problem is resolved by the version of the new Keynesian Phillips curve in *Smets and Wouters* (*2003*). This approach is based on a different concept of sticky prices. In the original Calvo model, a company either chooses a new price optimally or leaves the already existing one unchanged. In the amended model, it chooses a new price either optimally or by following a simple rule of thumb. While the idea behind the approach to sticky prices according to Calvo is that it is not worth changing the prices at each time period because it is costly, according to the amended approach it is not the price change that has a cost but the optimum determination of the prices, as the collection of the necessary information and the performance of calculations require resources.

All this is formalised as follows. A random process regulates the frequency of the time periods when a given company optimally determines the price of its product.

Let us use (1- γ) to indicate the probability that a firm will optimally set the price of its product in the next time period. Consequently, the probability that it will follow a simple rule of thumb at date t+1 is γ. It is assumed that the rule of thumb is an indexing scheme based on past inflation: $p_{t+1} = p_t(1+\pi_{t-1})^{\upsilon}$, where $0<\upsilon<=1$ is the degree of indexation. It is assumed again that γ is independent of when a company priced optimally last.[4]

On the basis of these assumptions the connection between inflation and the real economy can be described by the following formula:

$$\pi_t = \frac{\beta}{1+\beta\upsilon}\pi^e_{t+1} + \frac{\upsilon}{1+\beta\upsilon}\pi_{t-1} + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\left(1+\beta\upsilon\right)\gamma}\omega mc_t + \varepsilon_t \qquad (7)$$

Similarly to the above, the aforementioned quasi Phillips curve can also be expressed as

$$\pi_t = \frac{\beta}{1+\beta\upsilon}\pi^e_{t+1} + \frac{\upsilon}{1+\beta\upsilon}\pi_{t-1} + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\left(1+\beta\upsilon\right)\gamma}\omega\kappa y_t + \varepsilon_t \qquad (8)$$

or as

$$\pi_t = \frac{\beta}{1+\beta\upsilon}\pi^e_{t+1} + \frac{\upsilon}{1+\beta\upsilon}\pi_{t-1} + \frac{\left(1-\gamma\right)\left(1-\beta\gamma\right)}{\left(1+\beta\upsilon\right)\gamma}\omega\left[\kappa\left(1-\alpha\right)y_t + \alpha p^m_t\right] + \varepsilon_t \qquad (9)$$

Equations (*8*) and (*9*) are called hybrid new Keynesian Phillips curves.

In the hybrid new Keynesian Phillips curve, the greater the degree of indexation *v*, the higher the weight of the backward-looking inflation term. In the special case when *v* = 0, we get back to the original new Keynesian Phillips curve (*equations 5 and 6*). The slope of the Phillips curve depends on the same factors as in the case without indexation. The only difference is that the degree of indexation also affects the slope of the curve. The higher the degree of indexation, the flatter the Phillips curve.

It is true for the hybrid new Keynesian Phillips curve as well that in the short run monetary policy is able to affect the real economy, but over the long term this curve is also vertical, i.e. over the long term, monetary policy is able to influence the rate of inflation only. This latter assertion is modified to some extent if downward rigidity of nominal wages is introduced.

Originally, Keynesian economics deduced from the rigidity of nominal wages and not from that of prices that monetary policy may have a real impact. Moreover,

[4] A similar model can be found in *Christiano et al.* (*2005*), but the authors assume that v = 1.

they did not simply assume the stickiness of wages, but the downward rigidity of wages; see *Tobin* (*1972*). Emphasis shifted in the direction of price stickiness later.

At the same time, the assumption of downward wage rigidities was based on not strict empirical analyses, but rather on anecdotal opinion. By contrast, new classical economics expressly refused the assumption of any nominal rigidity, although these arguments were not empirical either, but logical. The concept of downward wage rigidities was revived in the late 1980s, as an increasing amount of empirical evidence supporting this assumption could be found; see the overview of these empirical analyses by *Akerlof et al*. (*1996*).

The consequence of downward wage rigidities is that the Phillips curve is not completely vertical over the long term either, so it is not true that over the long term any level of inflation can be reconciled with the natural rate of unemployment or output. In the case of downward wage rigidities, a very low level of inflation can only be maintained over the long term if unemployment is higher than its natural rate. This is one of the reasons why central banks do not pursue full price stability, but have a low, although not zero, inflation target.

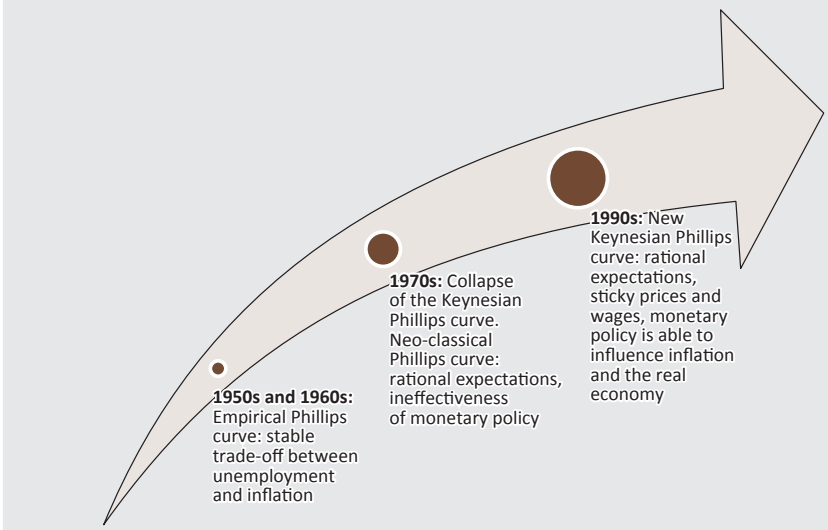
Intuitively, it can be explained as follows. For the sake of simplicity, let us assume that the developments in prices are exclusively determined by wages, and the real wage clears the labour market, except when attaining the equilibrium real wage would require the reduction of the nominal wage. In this case, nominal wage remains constant, and quantitative adjustment takes place in the labour market, or if the quantitative adjustment is large enough (many people lose their jobs), some nominal wage decline is tolerated. If inflation is relatively high, there is only a very low probability that the downward rigidity of nominal wages binds. Namely, if monetary policy tightening results in a negative shock for the economy and the real wage has to decline, due to the high inflation it may take place even if nominal wages are increased. Accordingly, in a case like this, wages (as well as prices) adjust flexibly, and thus the behaviour of the economy will be similar to the new classical case, and the Phillips curve will be vertical.

Nevertheless, with the above assumptions we come to completely different conclusions if inflation is very low, close to zero. In this case, if, due to monetary policy tightening, labour market equilibrium requires the reduction of real wages, it could take place only with declining nominal wages. Therefore, wages remain unchanged, and quantitative adjustment takes place, and if it is sufficiently significant, a slight nominal wage decline may take place. As a result, inflation declines slightly, but at the price of a high real loss. Accordingly, while the Phillips curve is almost vertical with high inflation, it is almost horizontal in the case of low inflation.

The above intuitive reasoning is corroborated by formal models as well, such as the static model of *Akerlof et al.* (*1996*) or the dynamic one of *Benigno and Ricci* (*2011*).

In summary: The empirical Phillips curve used in the 1950s and 1960s 'collapsed' during the stagflation of the 1970s. New classical economics gave an answer to this phenomenon by taking into account the impacts of inflation expectations, and a new Phillips curve approach was proposed, which, in turn, implied the ineffectiveness of monetary policy. New Keynesian economics accepted that expectations play a key role, but with the introduction of nominal rigidities it showed that in the short run monetary policy is able to affect both inflation and real economy. Moreover, in the case of downward wage rigidities, in a low inflation environment monetary policy is not neutral over the long term either. The history of thought outlined here is summarised in Figure 1.

Figure 1.
History of thoughts of the Phillips curve



Source: Own compilation based on the review of history of thoughts

5. Coefficients of the Phillips curve in a changing economic environment

The size of the coefficients and the degree of the slope of the Phillips curve have important economic policy implications. In a low inflation environment, a flat Phillips curve helps economic policy. In this case economic policy may stimulate economic growth while inducing negligible additional inflation. Or in a reversed case, if the economy is hit by a negative shock, it does not result in a deflationary spiral.

On the other hand, in a high inflation environment a flat Phillips curve causes difficulties for economic policy. In this case, if economic policy wants to cut inflation, and does not succeed in reducing inflation expectations, it can only be achieved by a major reduction of real economic activity, i.e. the sacrifice ratio of disinflation is high.

In view of the above, it is important to understand what factors influence the coefficients of the Phillips curve and how the change in the economic environment affects these. The effects of two factors are examined in this section: *(i)* firstly, the effects of the change in the inflation environment. *(ii)* Secondly, the effects of globalisation.

First, we examine how the inflation environment affects the three key parameters of the new Keynesian Phillips curve, i.e. γ, which represents the degree of price stickiness, v, which is the degree of indexation and ω, which measures the sensitivity of pricing decisions to competitors' prices.

In a high inflation environment, where prices change quickly, it is not worth maintaining prices for a long time, which justifies relatively frequent repricing, i.e. γ will be relatively small. Besides, even if a company does not price optimally in a given period of time, knowing that the general price level will increase in the given period, it will also raise its prices roughly by as much as the rate of inflation, and if it does not prepare an accurate forecast, it will estimate the rate of inflation on the basis of past inflation, and thus the value v of will be relatively high.

High inflation environment affects the value of parameter ω as well. The study by *Mackowiak and Wiederholt* (*2009*) shows that if optimal decision making is costly and a choice has to be made whether to decide mainly on the basis of macroeconomic or microeconomic information, in the case of high and volatile inflation it is better to concentrate on the macroeconomic factors during optimal pricing, and accordingly in this case the value of ω will be relatively high.

Summarising the above, in the case of high inflation the weight of the backward-looking term in the Phillips curve is expected to be high. Moreover, if prices are sufficiently flexible, the coefficient of the output gap will also be relatively high, which means that inflation can be reduced with a relatively small real economy sacrifice. This is in line with the empirical observation that if there is political will and credibility, the reduction of two-digit inflation to one-digit is usually a relatively simple task that can be performed relatively quickly.

If there is price stability, i.e. in a low and predictable inflation environment, it is not important to index to past inflation, especially if inflation expectations are anchored due to a credible monetary policy. Therefore, the value of v may be close to zero. As the average change in prices is smaller, if a company does not reprice

optimally, it makes a smaller mistake; therefore, the motivation for regular optimal repricing is lower, i.e. the value of γ may be relatively high. Besides, in the case of low inflation, sector specific information regarding the behaviour of competitors appreciates during decision making, while the weight of macroeconomic factors depreciates. Accordingly, the value of ω will be low.

Based on the above, in a low inflation environment, if inflation expectations are anchored (for example in the case of a successful inflation targeting regime), the weight of the forward-looking inflation term will be high, while that of the backward-looking term will be low in the Phillips curve. In addition, if prices are sufficiently sticky, the coefficient of the output gap will be low, i.e. the Phillips curve will be flat. In the case of downward wage rigidities, the curve will become even flatter in parallel with a close-to-zero inflation rate. All of this is in line with the observation that the further reduction of relatively low inflation is possible only with significant real sacrifice.

The following presents an examination of how globalisation affects the coefficients of the Phillips curve. Trade relations become stronger as a result of globalisation. One of the consequences is that often better-quality and/or cheaper foreign inputs are used for production instead of the domestic input used before. As a result, in real marginal cost equation (*4*), α, the weight of foreign input will grow, and therefore, in the new Keynesian Phillips curves (*6*) and (*9*) the coefficient of output gap y_t will decline, i.e. the curve will be flatter.

At the same time there is another impact as well, which is examined in *Sbordone* (*2007*). Accordingly, another effect of globalisation is that a company in a given sector will have multiple competitors. One of the consequences is that as a result of changing a given firm's individual price, the demand for the firm's products changes to a greater extent than in the case of fewer competitors (for example, in the case of a price increase, demand for the products of a monopoly falls to a lesser extent than if the same price increase was implemented by a company in a competitive market). Accordingly, the presence of multiple competitors stemming from globalisation reduces the size of ω, as the importance of aggregate economic indicators relatively depreciates from the point of view of the given firm compared to the impact of the decisions of the competitors in the sector. At the same time, the price sensitivity of demand is relevant in terms of the optimal pricing decision only as far as the changing demand affects the marginal cost of the given company. The lower the degree of decreasing returns in the firm's production function, the lower the impact of demand on the marginal cost. Sbordone argues that, as a result of stronger competition, the demand sensitivity of marginal cost declines, which, in turn, adds to ω, as it devalues the role of competitors and raises the weight of macroeconomic developments. Sbordone examined the result of these two impacts with the help of a calibrated model; according to his findings,

the second impact is stronger, i.e. ω increases as a result of globalisation, and the Phillips curve will be steeper.

At the same time, *Guilloux-Nefussi* (*2015*) challenges the correctness of Sbordone's assertions. In her opinion, globalisation cannot simply be described by the fact that there will be more competitors in the market. More productive firms will have greater opportunities in a larger market, and will be able to have a higher share in export markets. Consequently, due to their size they will be less sensitive to competitors' decisions, which reduces ω, i.e. globalisation eventually still points to the flattening of the Phillips curve.

6. Empirical results

Although the new Keynesian Phillips curve that is based on the Calvo pricing provides a versatile theoretical framework, it becomes really practicable if it is possible to measure the parameters of the curve empirically.

One of the first attempts to do so was made by *Galí and Gertler* (*1999*). Their analysis did not focus on economic policy; they primarily wanted to know whether they would be able to estimate significant parameters whose sign is consistent with the theory. Therefore, the estimated equation did not include the output gap, but it included the real marginal cost, which is a more fundamental notion from the aspect of the theory.

They prepared their estimate for the United States, and approximated the real marginal cost with the wage share, while capturing inflation expectations with instrumental variables. Their findings were consistent with the theory. Firstly, they confirmed the importance of inflation expectations; according to their estimates, the coefficient of the backward-looking inflation term is much smaller than that of the forward-looking one. Secondly, the coefficient of the real marginal cost term is significant and positive. Using European data, the findings of the study by *Galí et al*. (*2001*) are similar.

Their findings were of high importance in terms of the testing of the new Keynesian Phillips curve, but at the same time their method was criticised by many. For example, *Rudd and Whelan* (*2002; 2007*) call attention to the fact that the applied GMM method tends to overestimate the coefficient of the forward-looking inflation term.[5]

Below is an overview of studies whose focus is not on the methodology, but on the question that is important in terms of practical economic policy, i.e. how the parameters of the Phillips curve change over time.

[5] In her study, *Lendvai* (*2005*) prepared a similar estimate for Hungarian data. See also the studies by *Kucsera* (*2013*) and (*2014*).

Roberts (*2006*) estimated the slope of the reduced-form Phillips curve for the data of the United States for two different periods: 1960–1983 and 1984–2002. He found that the slope of the curve declined nearly to half by the second period. The decline in the curve, although not its degree, can be considered robust even in the case of various specifications of the output gap. On the basis of the production function based output gap, the fall is between 30 and 40 per cent depending on the period chosen (1961–1979 or 1961–1983), while applying the output gap used by the US Congressional Budget Office the decline in the slope of the curve is merely between 12 and 23 per cent.

Williams (*2006*) also tried to estimate the possible change in the slope of the Phillips curve using data for the United States. He carried out the estimation on samples of various periods: the samples started between 1980 and 1999, and always ended with 2006. According to the findings, the slope was much lower in the case of the samples starting in the 1990s than in the case of ones starting in the 1980s.

Boivin and Giannoni (*2006*) estimated structural VAR models for US data for two different periods: 1959–1979 and 1979–2002. According to their estimate, the slope of the Phillips curve declined by more than 25 per cent between the two periods. In the authors' opinion, the underlying reason for this may have been the increase in price rigidities.

Borio and Filardo (*2007*) prepared their estimate for 16 developed countries and the euro area starting from 1972. The study called attention to the importance of global developments in terms of changes in inflation. It is important to emphasise that this empirical recognition is fully in line with the theoretical framework of the new Keynesian Phillips curve described in the previous section, as discussed therein. Nevertheless, most of the empirical works did not take the opportunity to examine this theoretical possibility.

This is why the study by Borio and Filardo is interesting; it points out that in terms of the developments in inflation the global factor is of significant importance. In their opinion, the models used for the forecasting of inflation are too country specific, and according to their analysis, models with more global approach are able to better capture the real developments. Based on their findings, the inclusion of the cyclical position of the world economy in the inflation model significantly increases its explanatory power, and in parallel with that the given country's cyclical position may be less relevant in terms of the developments in inflation.

The effects of the increasing globalisation in the world economy on inflation may appear through multiple channels. The development of the telecommunications sector significantly facilitated the geographical relocation of production and the decomposition of the production process into its components. The range of tradable goods expanded, and thus the substitutability of these products

across countries also increased. In addition, for economic agents the removal of the obstacles of foreign trade and financial regulations also contributed to the possibility of benefiting from technological innovations. Moreover, channelling of the countries that used to be based on planned economy into world trade also had a serious impact on the production potential of the global economy. All of these effects contributed to the possibility that global economic factors can more strongly influence developments in inflation in individual countries. In addition, the trend of the shift towards lower inflation can be identified through two channels. Approaching from the production side, a decline in wages may be caused by production relocation into countries with lower wage levels or by higher immigration, while examining from the demand side, the increasingly strong market competition may also result in lower inflation.

In its study, the *IMF* (*2006*) basically examined what impact globalisation may have had on the developments in inflation in the past decades. For the period of 1960–2004 a model was estimated for 8 developed countries to describe the developments in inflation, and the model is actually an extension of the framework of the traditional Phillips curve. According to the findings, the sensitivity of prices to the output gap really declined in the past decades. Similarly to the study by *Borio and Filardo* (*2007*), the authors identify globalisation as the main factor.

At the same time, some dispute the role of globalisation in the flattening of the Phillips curve. In their study, *Ihrig et al.* (*2008*) estimated a Phillips curve equation for 11 OECD countries for the period 1977–2005. The slope of the Phillips curve estimated for the period 1977–1990 became higher than the one estimated for 1991–2005; accordingly, flattening of the curve is seen here as well. At the same time, in the authors' opinion there is no evidence that this decline is a result of globalisation. The countries where the importance of the domestic output gap declined the most were not the ones where the openness of foreign trade increased the most. In addition, based on the estimates, foreign trade openness did not have a significant impact on the sensitivity of inflation to output.

According to the Phillips curve estimate of *Ball* (*2006*) for the G7 countries for the period 1971–2005, foreign trade does not play a role in the flattening of the curve, and therefore he rejects the possibility that this phenomenon is caused by globalisation.

As a result of the deep and long-lasting global economic recession that unfolded as a consequence of the 2007–2008 financial crisis, special attention was paid to the issue of the slope of the Phillips curve. The underlying reason is as follows: as a result of the protracted recession, the output gap became negative to an unusual extent in developed countries, but the decline in inflation still remained moderate. Although it reached a much lower level than before, persistent deflation did not occur.

In terms of understanding this phenomenon, the study by *Blanchard et al.* (*2014*) is of key importance. It is a comprehensive analysis of the issue both in time and space: the Phillips curve was estimated for 20 countries with the help of time series starting in 1960, with variable parameters technique.

The estimated equation is as follows:

$$\pi_t = -\theta_t\left(u_t - u_t^*\right) + \lambda_t \pi_{t+1}^e + \left(1-\lambda_t\right)\pi_{t-1} + \mu_t \pi_{mt} + \varepsilon_t \qquad (10)$$

where π_t indicates inflation, u_t is the unemployment rate, u_t^* is the natural level of unemployment (the authors do not use the output gap, but they use the unemployment gap, which is closely related to the former), π^e_t represents long-term inflation expectations, π_{t-1} is the one quarter delaying of inflation, while π_{mt} indicates imported inflation compared to inflation (measured as deviation from the average).

Actually, the coefficient of λ_t indicates the stability of inflation expectations, the parameter θ_t is the slope of the Phillips curve, while μ_t reflects the importance of imported inflation.

The findings suggest that firstly, the stability of long-term inflation expectations has increased significantly since the 1970s, and secondly, the slope of the Phillips curve declined considerably over time. The increase in the anchoring of expectations is especially visible in the results of the USA, where this coefficient has grown significantly since the early 1990s. The decline in the slope of the Phillips curve mostly took place in the period between the 1970s and the 1990s; the coefficient did not decline further during the latest crisis.

Based on *Table 1*, it can also be established that while in 1985 the coefficient of the slope was significant everywhere except for 2 countries, in 2014 already in the case of 16 countries out of the 20 included in the estimate this value is not significantly different from zero. Accordingly, this relation is practically insignificant in statistical terms in most countries.[6]

The findings of the study by *Matheson and Stavrev* (*2013*) are similar. They estimated the Phillips curve on US data from 1961 to 2012, using a variable parameter model. Based on their results, the Phillips curve describes the developments in inflation in this period well. The parameter of the slope of the Phillips curve declined steadily in the estimation period, and by the very end of the sample it was only half of its value measured in the 1970s. Moreover, the decline in the coefficient can be considered robust for the various specifications of the natural rate of unemployment as well.

[6] In addition to the changes in the parameters of the Phillips curve, Blanchard et al. also examined whether post-crisis recessions are attributable to hysteresis, and discuss the economic policy implications of this issue. As this is beyond the scope of our study, these issues are not discussed in this paper.

According to their findings, inflation expectations were not anchored in the 1970s; they became increasingly backward-looking and were volatile. However, starting from the 1980s, long-term inflation expectations started to decline before becoming stable at a lower level by the 2000s.

Table 1.
Coefficients on the unemployment gap, in 1985, 2000, 2014

Country	Year	Coefficient	Standard error	Country	Year	Coefficient	Standard error
USA	1985	0.34	0.23	Switzerland	1985	3.32	1.6
USA	2000	0.23	0.18	Switzerland	2000	0.52	1.05
USA	2014	0.16	0.28	Switzerland	2014	0.96	1.24
Japan	1985	4.97	1.67	Sweden	1985	0.73	0.71
Japan	2000	0.78	0.98	Sweden	2000	0.61	0.57
Japan	2014	3.45	2.98	Sweden	2014	0.76	0.94
Germany	1985	0.72	0.18	Belgium	1985	0.67	0.22
Germany	2000	0.17	0.2	Belgium	2000	0.51	0.42
Germany	2014	0.03	0.25	Belgium	2014	0.56	0.76
UK	1985	0.8	0.37	Norway	1985	0.84	0.38
UK	2000	0.02	0.46	Norway	2000	0.43	0.39
UK	2014	0.24	0.94	Norway	2014	0.56	0.64
France	1985	1.11	0.21	Austria	1985	0.59	0.27
France	2000	0.38	0.33	Austria	2000	0.58	0.27
France	2014	0.65	0.42	Austria	2014	0.57	0.28
Italy	1985	1.31	0.34	Denmark	1985	0.58	0.29
Italy	2000	0.04	0.42	Denmark	2000	0.11	0.3
Italy	2014	0.4	0.37	Denmark	2014	0.22	0.39
Canada	1985	0.56	0.21	Ireland	1985	0.72	0.3
Canada	2000	0.35	0.26	Ireland	2000	0.29	0.23
Canada	2014	0.08	0.47	Ireland	2014	0.24	0.4
Australia	1985	0.27	0.31	Greece	1985		
Australia	2000	0.99	0.5	Greece	2000	0.15	0.11
Australia	2014	0.08	0.79	Greece	2014	0.15	0.11
Spain	1985	0.39	0.11	Portugal	1985	1.88	1.12
Spain	2000	0.11	0.14	Portugal	2000	0.38	1.06
Spain	2014	0.18	0.1	Portugal	2014	0.22	0.91
Netherland	1985	0.33	0.13	New-Zealand	1985	1.07	0.59
Netherland	2000	0.34	0.13	New-Zealand	2000	0.1	0.76
Netherland	2014	0.33	0.14	New-Zealand	2014	0.98	1.22

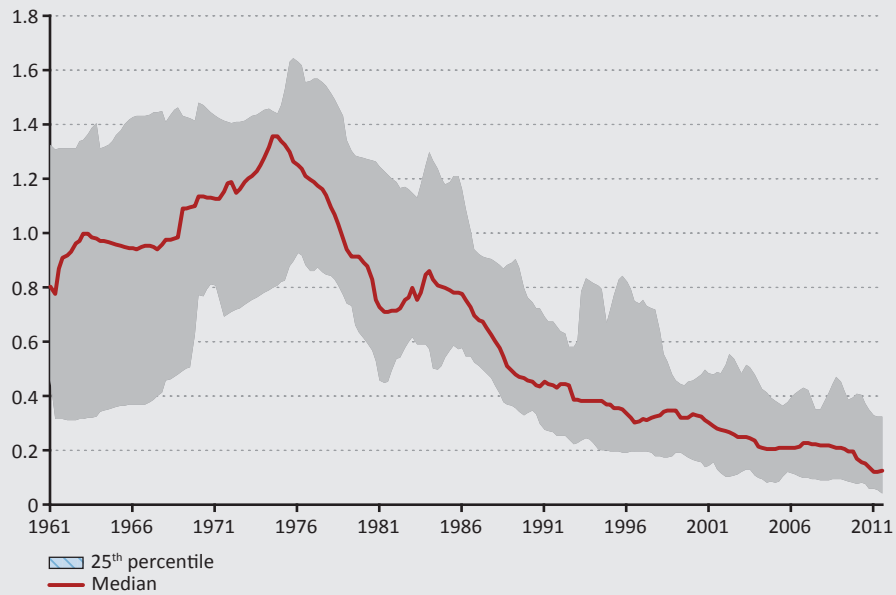
Source: Blanchard et al. (2014)

In addition, they documented the growth in the importance of imported inflation, which is not surprising in view of the increasing import penetration and globalisation, and is in line with the findings of the study by *Borio and Filardo* (*2007*).

The findings of the *ECB* (*2013*) are also in conformity with the above. This study contains separate estimations for the slope of the Phillips curve for the euro area between 1997 and 2013 as well as for wage inflation and inflation, and, based on their findings, in both cases the impact of real economy factors on inflation has declined since the beginning of the crisis.

The study of the *IMF* (*2013*) estimated the parameters of the Phillips curve on the data of 21 developed countries between 1961 and 2011. It was found that the slope of the Phillips curve has been steadily declining since the mid-1970s (as shown in *Figure 2* as well), while the degree of anchoring of inflation expectations has continuously been increasing since hitting the bottom in the 1970s. However, the authors did not find a clear trend in the sample period in the case of the parameter that measures the importance of global factors.

Figure 2
Slope of the Phillips curve



Source: IMF (2013)

For the interpretation of the above results that confirm one another, it is worth referring back to the theoretical framework discussed in the previous section. The Phillips curve becomes flatter if prices become stickier (γ increases), while the weight of the forward-looking term will be greater if the degree of indexation, i.e. v, declines. As it was discussed, a stable, low inflation environment where monetary policy effectively influences expectations may induce these changes.

All of this is in line with the fact that in the past two decades in the developed world an increasing number of countries adopted inflation targeting based on the management of inflation expectations, with the help of which they succeeded in creating a low inflation economic environment.

This process had already started prior to the outbreak of the 2007 crisis, but the subsequent protracted recession further reduced the level of inflation, which amplified the developments that had started before. Although the aforementioned studies do not prove it directly, since the outset of the crisis downward wage rigidities also have presumably added to the trend of the flattening of the Phillips curve. As presented in the previous section, downward wage rigidities become important and contribute to the flattening of the Phillips curve when the inflation rate comes close to zero per cent. And, the recent recession was exactly this kind of period.

At the same time, it is attributable not only to the flattening of the Phillips curve that the decline in inflation remained moderate during the crisis in spite of the significant negative output gap. According to the *ECB's* (*2013*) study, it also played a role that the composition of employment may have changed as a result of the crisis, and since the recession had a negative effect mostly on the low-qualified workers, the ratio of highly qualified people is higher among the employed, which, of course, adds to the level of aggregate wages. In addition, the increase in indirect taxes and administrative prices as a result of the fiscal consolidation may also have raised the level of inflation.

A further possible explanation of why the decline in inflation was not greater during the crisis is that a considerable portion of the observed high unemployment is attributable to long-term effects and not to cyclical ones. Consequently, the negative output gap is smaller, as the output gap is related to cyclical factors. The *IMF* (*2013*) study examines this argument from an empirical point of view, but rejects it, and is clearly in favour of the flattening of the Phillips curve and the anchoredness of expectations.

In connection with the results discussed so far, it is worth highlighting that if the output gap has only a small effect on inflation, it implies that the stabilisation of inflation requires enormous movements in the output gap. Moreover, if this relation is not only weak but uncertain as well, even significant changes in the

output gap do not necessarily guarantee the control of inflation. Accordingly, monetary policy should focus on output instead of inflation, but it is justified to ask what determines inflation in this case. Based on the results, inflation expectations do, which, in turn, are determined by the anchoring of expectations.

At the same time, the results have ambivalent implications. Although confidence in central banks increased considerably in connection with the achievement of the inflation target, simultaneously with that, central banks' ability to actually attain their objectives declined significantly, raising the question of what will anchor expectations in the future.

The overall picture related to the flattening of the Phillips curve is refined by some further empirical analyses. In his study, *Stevens* (*2013*) estimated the Phillips curve equation used in the articles by *Blanchard et al*. (*2014*) as well as *Matheson and Stavrev* (*2013*) for the euro area from 1980 to 2013, with the help of a somewhat different econometric specification. His main findings are similar to those of the aforementioned authors: the anchoredness of expectations increased, the importance of imported inflation grew, and the slope of the Phillips curve declined in the period under review. Although according to their estimations the slope of the Phillips curve will increase again at the end of the period, it is probably the result of the fact that the movement at the end of the period in the time series is identified by the HP filter as a trend, and therefore the estimate for cyclical unemployment underestimates the fall in demand during the current crisis. Eventually this results in the overestimation of the slope of the Phillips curve at the end of the estimation period.

Riggi and Venditti (*2015*) prepared an estimate for euro area data from 1999 to 2014. Their results are basically in line with the above, i.e. flattening of the Phillips curve is observed in the long run. At the same time, they claim that the situation changed in 2013 and 2014, and the Phillips curve became steeper. According to the authors, this may stem from changes in the structure of the economy. On the one hand, they mention lower nominal rigidities (more frequent price adjustments) as a possible underlying reason, which may be attributable to the structural reforms of some countries. On the other hand, they think it is possible that it was not the slope of the Phillips curve that changed, but that the output gap may be larger than estimated now.

Oinonen and Paloviita (*2014*) examined the slope of the Phillips curve in the case of the euro area for the period between 1990 and 2014 using a variable parameter estimation, with three different output gap variables. They found that the slope of the Phillips curve had increased since 2012. However, together with the Phillips curve's becoming steeper, they emphasise that changes in expectations remain one of the most important factors influencing euro area inflation.

7. Conclusions

The equation that captures the correlation between the developments in inflation and real economy developments is called the Phillips curve. Originally, the Phillips curve was a stable empirical relation discovered in the 1950s, which collapsed and became invalid during the stagflation of the 1970s. Nevertheless, complemented with expectations, the Phillips curve has remained a useful analytical tool.

The new Keynesian Phillips curve, which is widely used nowadays as well, captures the relationship between inflation, inflation expectations and the output gap. The coefficient of the output gap, i.e. the slope of the Phillips curve, is of key importance in the equation in terms of economic policy.

According to most of the empirical studies, a flattening of the Phillips curve was observed in the past decades, i.e. the coefficient of the output gap declined significantly. This is mainly attributable to the changes in corporate pricing behaviour and to the process of globalisation. At the same time, there is no guarantee that the trend of flattening will continue; in fact, as a result of certain circumstances, it may even reverse.

In the current low inflation environment, the flat Phillips curve is advantageous for economic policy, because it is possible to induce significant growth with minimum additional inflation.

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Possible explanations of the low inflation environment and restrained investment activity

Orsolya Csortos – Zoltán Szalai

As a result of the crisis that erupted in 2008, economic activity and inflation have remained weak in the developed countries, and signs of slowdown have also been seen in emerging countries that had performed relatively well in the initial years of the crisis. The slow rate of growth and persistently low inflation create new challenges for monetary policy. The correct economic policy answers can only be found by exploring the reasons for this phenomenon. In 2015, the key focus was often on short-term factors such as falling oil prices. Prices of other commodities have shown similar volatility in recent years, implying that short-term inflation surprises are not only being caused by developments in the energy market. At the same time, core inflation indicators excluding food and energy prices were also low, raising the question whether the inflation trends are dominated by medium-term or long-term factors. One possible explanation of the poor performance of the real economy is that in the pre-crisis years, growth was based on significant indebtedness of economic agents, which were then forced to adjust their balance sheets after the asset price bubble burst. This is a process stretching over several years, and it suggest low inflation and growth rates over the medium term as well. In the views of others, the present slow growth is the continuation of a trend lasting several decades that had already started before the crisis and was only interrupted by the crisis and the adjustment. One group of long-term explanations explains the lengthy recovery with real economy factors, including the imbalance between savings and investments ("secular stagnation" and "savings glut" theories). However, more and more people are emphasising the limitations of these real analyses, and explain the restrained investment activities with changes in the financial structure, corporate finance and corporate governance. This paper deals with the reasons for the globally low inflation, which has recently come into focus for many leading economists and international organisations. We summarise the different views and opinions, which – due to the nature of the issue – primarily reflect the considerations of developed countries, but indirectly determine the future of the whole world economy.

Journal of Economic Literature (JEL) Classification: E31, E43, E44, E52, G32

Key words: inflation, economic growth, corporate governance, corporate financing, monetary policy, monetary analysis

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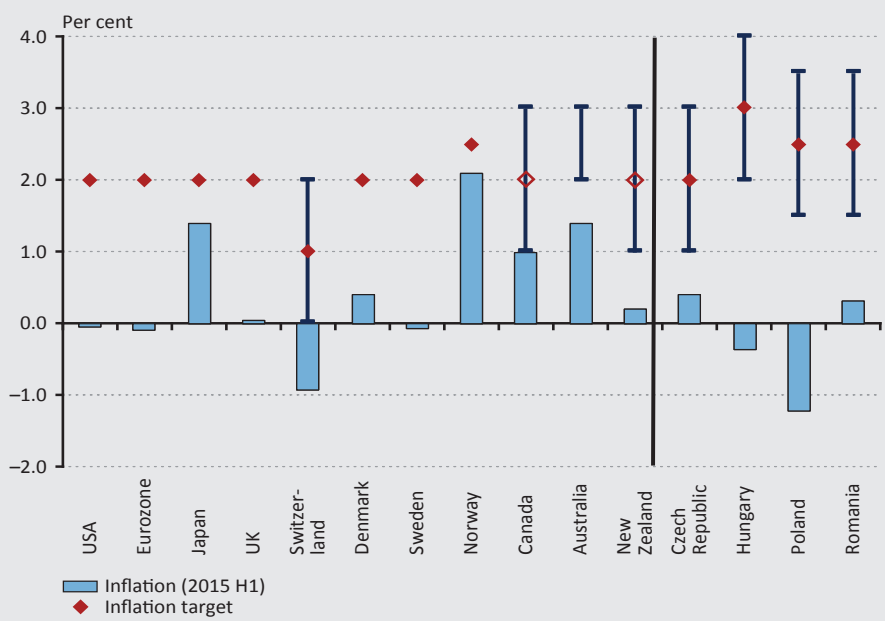
1. Introduction

Seven years after the crisis that peaked in 2008, the monetary policies of the key developed countries are still moving in different directions, as the economy of the United States shows relative strengthening compared to Japan and the eurozone. In the meantime, the significant drop in oil and other commodity prices and the subdued wage dynamics raise the risk that inflation may lag behind central bank targets for a longer time, and in some cases, the emergence of deflation also cannot be ruled out (*Figure 1*).

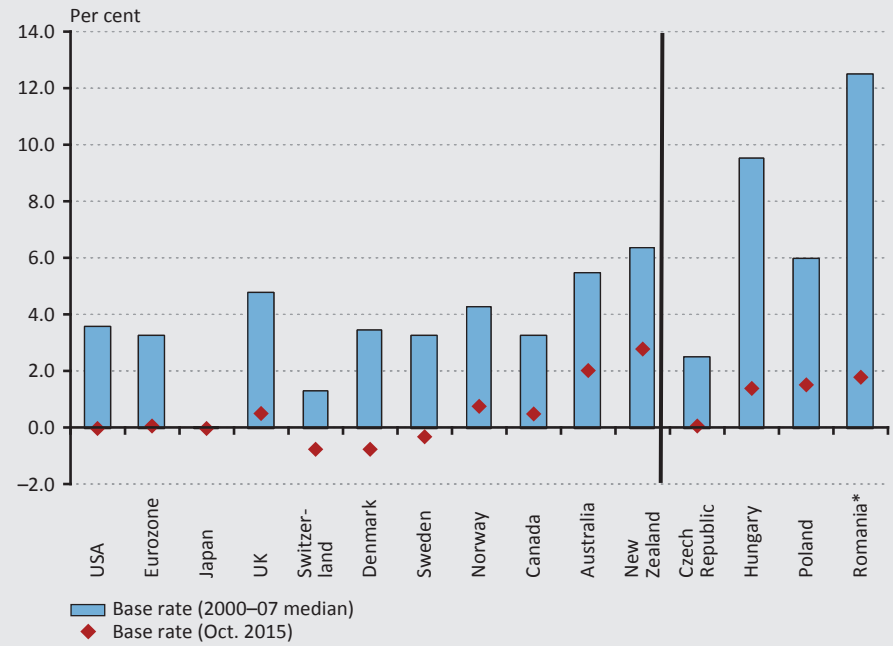
Due to the slow economic growth rates and low inflation, interest rates are historically low or (sometimes) negative, and therefore the effectiveness of the traditional monetary policy tool, i.e. the key interest rate, is decreasing (*Figure 2*). This new environment generates new challenges for monetary policy, and it can address those only if it is able to properly diagnose the reason for low inflation and slow growth and find the appropriate tools for raising inflation to the target level. In the following, we describe the key possible explanations of the phenomenon mentioned in economic debates and the related possibilities of handling it with economic policy tools.

Figure 1.
Inflation and inflation targets in developed countries and in the Central and Eastern European countries



Source: National central banks

Figure 2.
Policy rates before and after the crisis



**For calculating the median in Romania data were available only after 2003.*
Source: National central banks

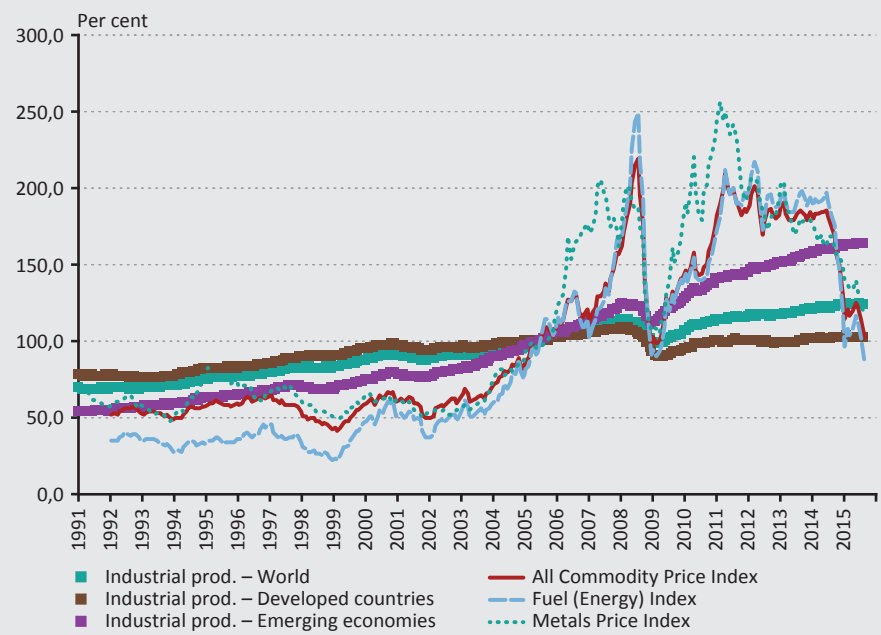
2. Short-term factors: low commodity and oil prices

In recent months, commodities with usually volatile prices, such as oil and other commodities, have received the most attention in explaining the unexpectedly low inflation. At the same time, core inflation indicators excluding food and energy prices were also low and are also expected to remain low over the usual forecast horizons, raising the question whether inflation trends are dominated by medium-term (cyclical, financial) or long-term (permanent, real) factors.

After a four-year period when oil prices ranged at over USD 100, prices started to dramatically fall in mid-2014, with the price of the Brent oil dropping below USD 50 at the beginning of 2015. The most frequently cited explanations include the upswing in the extraction of American shale oil on the supply side, and falling oil demand because of the poor Asian and European growth. *However, it is widely believed that real economy processes alone did not justify the extent of the changes in prices, and that these changes may have been amplified by financial market factors affecting the oil and commodity markets.*

Figure 3 shows the development of industrial production in developed and developing countries and the whole world, together with certain commodity and energy price indices. The figure implies that there were also other factors which played a role in the development of the oil price, apart from the real economy factors. Although the development of the oil price has recently received more attention, if we look at a longer horizon, it is clear that prices of other energies and commodities have moved similarly to the price of oil. This observation reduces the persuasive force of arguments which explain the development of the oil prices with oil market factors such as the quite spectacular expansion of shale oil production or features in the oil storage and transport capacities. It is also obvious that commodity and energy price indices tend to move between extremes more frequently than industrial outputs, which represent user or "real" demand. Similarly to the price of financial assets, oil and commodity prices exceed their own trends and the trends in industrial production, both in times of recovery and recession. This may indicate that movements in commodity prices, including oil prices, are also strongly influenced by expectations on the financial and speculative markets.

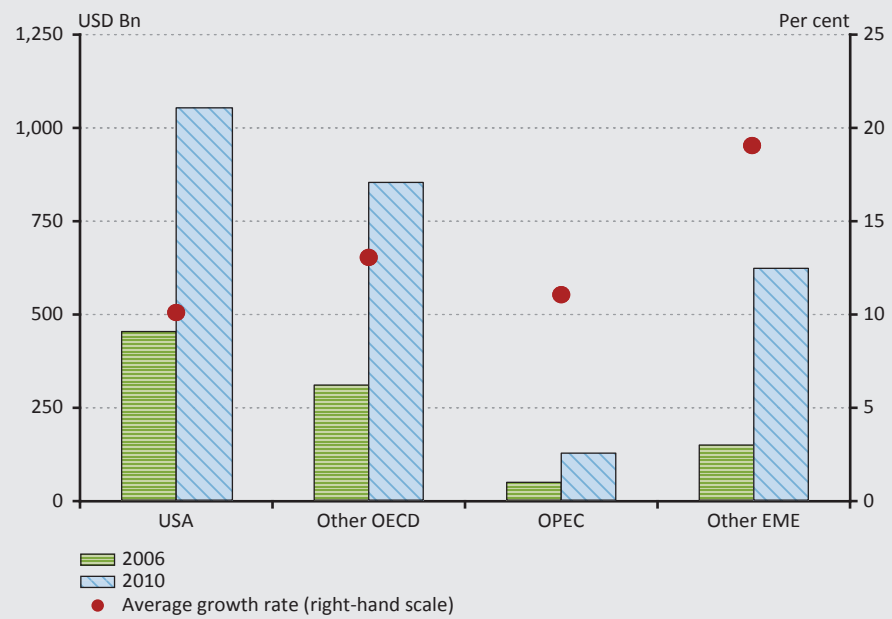
Figure 3.
Industrial production and commodity price indices
(2005 = 100)



Source: IMF (2015c) and Bureau for Economic Policy Analysis (2015)

The *BIS* (*2015a*) has pointed out that since 2006, borrowing by oil extraction companies – mainly outside the USA – has increased dynamically, and this has taken place in the context of low interest rates and weak US dollar rates. Together, the high level of indebtedness and its USD denomination, as well as the low oil prices, may cause serious financial difficulties for these firms. As a result of falling oil prices, the profitability of companies decreases, which causes liquidity problems, and thus the risk of bankruptcy and non-performance increases. In addition, appreciation of the US dollar in itself increases debt servicing burdens for many companies (*Figure 4*). Companies may react to the situation in different ways. On the one hand, they may sell their existing assets and equipment, and reduce their capital costs. On the other hand, seriously indebted extraction companies may maintain or even increase their extraction in spite of the low oil prices, in order to secure the necessary liquidity and debt servicing funds, which may strengthen the initial fall of oil prices and may force additional balance sheet adjustments.

Figure 4.
Debts of oil and gas companies



Source: BIS (2015a)

In addition to oil extraction companies, a number of financial investors (from pension funds to hedge funds) took positions financed with cheap loans at low interest rates on the forward and derivative oil and commodity markets. As expectations about a rate increase by the Fed strengthened, costly positions

were closed and derivative contracts were sold, pushing oil and commodity prices downward, and exacerbating the fall in spot market prices.[1]

Another important factor is that the development of energy prices plays a strong and (over the short term) determining role in the path of the consumer price index, although to different extents in each country. However, the pass-through of commodity prices to the consumer price index may change over time: in the 1970s and 1980s, high oil prices increased the price of other products as well and also raised core inflation and inflation expectations as well. Although the role of commodity prices in the consumer price index has continued to rise (*Figure 5*), over the last two decades these secondary effects have been mitigated, as movements in energy prices are reflected in core inflation indicators to a lesser extent[2] (*BIS 2015b*). At the same time, core inflation indicators which eliminate the development of food and energy prices were also low, possibly implying that the evolution of commodity prices is not the only factor playing an important role in low inflation (*Figure 6*).

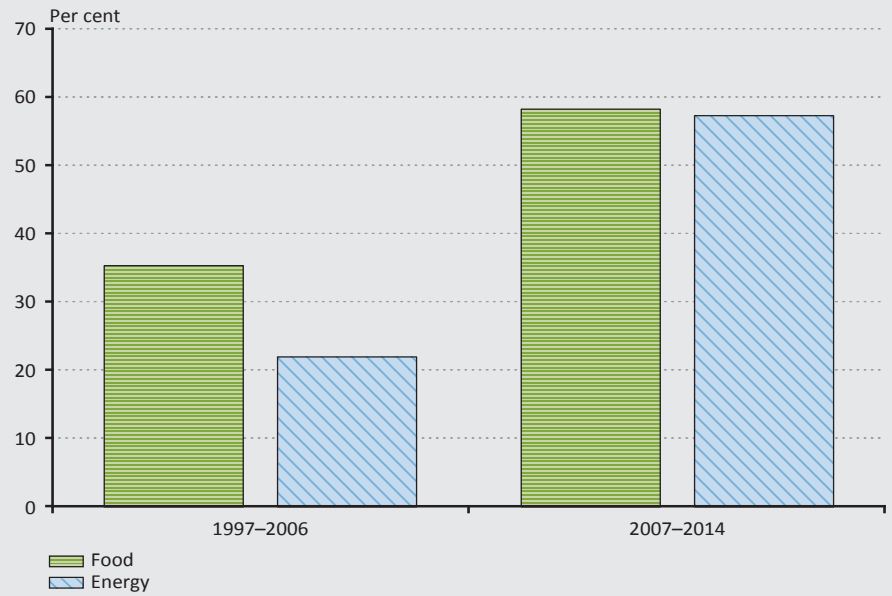
On the whole, one of the explanations for the low inflation which received the most attention was the development of oil prices. However, the development of oil prices may have been influenced by individual factors affecting the oil market which will slowly fade and will hardly be repeated to a similar extent. At the same time, it can be observed that in terms of the evolution of the low inflation environment, restrained commodity prices in a wider sense also play a significant role, and they are not affected by the features of the oil market. Financial market conditions determining the global economy have a direct influence on the development of oil and commodity prices, which are becoming more similar to financial assets. Their increase or decrease in itself gives little information on the real economy demand and supply conditions, because the prices are strongly influenced by expectations about future energy and commodity prices. In addition to real economy factors, prices are also influenced by volatile financial conditions and expectations about monetary policy steps, and the interactions of these factors as well.[3] *Nevertheless, core inflation indicators excluding food and energy prices have also remained low,*

[1] Fluctuations in commodity prices are further amplified by the fact that some investment banks used the various goods as collateral for their additional borrowings, and therefore withdrew large quantities of these goods from the physical markets. When the US Congress initiated a procedure against them because of price fixing, this collateral entered the markets in large volumes, putting pressure on prices on other commodity markets. The process in which the development of commodity prices is increasingly determined by financial market processes, and the prices behave like in those markets, is called the "financialisation" of commodities. This term had been used before by some economists for modern large companies, households and even for modern economies in general (See section 4.7 for more details).

[2] In addition to commodity prices, the development of the exchange rate is another factor that plays a key role in the development of inflation over the short term. In this respect, experiences also indicate that the extent of exchange rate pass-through has decreased recently (*BIS 2015, p. 68–70*).

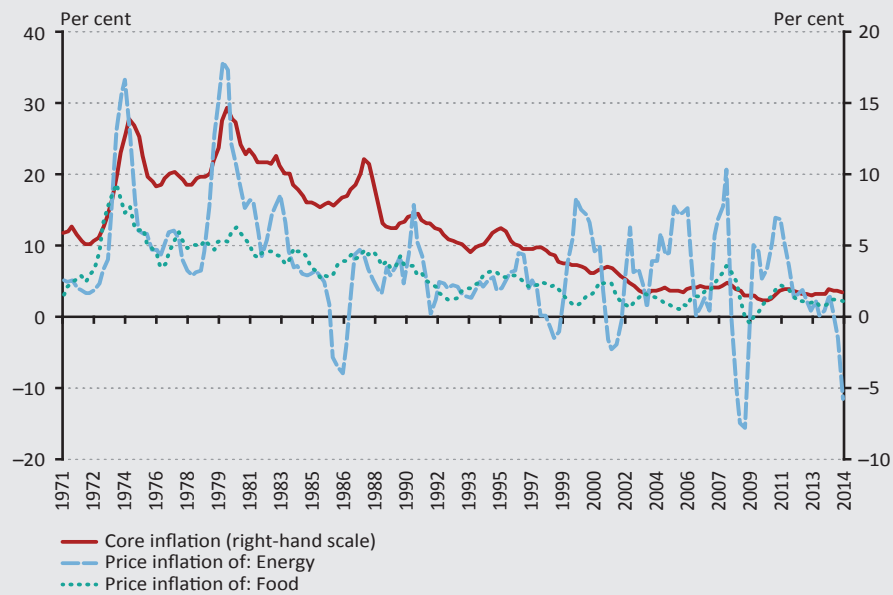
[3] Such expectations often have a only very indirect relationship with so-called fundamentals, which are usually driven by the physical demand determined by economic growth prospects and the physical (production and warehouse) capacities. See *Thaler* (*2015*).

Figure 5.
Correlation between commodity prices and inflation



Source: BIS (2015b)

Figure 6.
Core inflation and commodity prices



Source: BIS (2015b)

raising the question as to whether inflation trends are dominated by medium-term or long-term factors.

3. Medium-term explanation: balance sheet recession

The fact that the so-called core inflation indicators, which do not contain food and energy prices, were also low, strengthens the arguments that medium-term cyclical factors related to financial processes also play a role in the development of inflation. Therefore, one potential explanation for the current low inflation coupled with moderate growth is the balance sheet recession and balance sheet adjustment by economic agents.

The dynamics of balance sheet crises are as follows: with optimistic expectations regarding the future, economic agents become indebted too quickly and to a high extent, which leads to the creation, and then bursting of an asset price bubble. Following the bursting of the asset price bubble, economic agents face a significant drop in their income and in the value of the assets used as collateral for their loans, and therefore repayment of their accumulated debts represents an increasingly difficult challenge, prompting them to increase their savings. In the course of this balance sheet adjustment process, conventional monetary policy stimulus is not an efficient tool until the willingness of the private sector to borrow is adequately strengthened. Consequently, fiscal stimulus which is lasting and significant enough may be efficient in boosting demand. When the fear of extreme indebtedness is reduced, and economic agents begin to show higher funding requirements, monetary policy can be efficient again. However, when the optimism of economic agents becomes too high, it may generate another financial market bubble, and may cause another crisis (on the reasons, dynamics and management of balance sheet crises, see *Koo 2014 and Csortos–Szalai 2015* for more details).

Therefore, the lengthy recovery may be justified by the fact that indebted economic agents attempt to adjust their balance sheets. This means that during the period of balance sheet adjustment, households and companies spend their extra income on faster repayment of their debts, instead of taking new loans or realising new investments, and therefore they can save the new funds ("flows"), and spend them on the restoration of their balance sheets and on the termination of their portfolio burdens ("stock") and debts. As a result of this, the greater the damage to the balance sheets, the longer the cleaning lasts. In addition, when synchronised balance sheet adjustment occurs – i.e. when several sectors within a single economy (e.g. households, companies, banks) or, in the world economy, several countries or regions attempt balance sheet adjustment at the same time – it makes the efforts of the agents more difficult, and thus leads to a more dramatic fall in aggregate demand and a delayed recovery. Poor demand will also

ultimately have an adverse effect on output, as a result of which a situation close to stagnation may emerge (*MNB 2014, Chapter I*).

In Koo's view (*Koo 2014*), this phenomenon may be mitigated if fiscal policy plays an effective role in crisis management and supports the increased income of economic agents with fiscal stimulus of proper extent and duration, at the cost of budget indebtedness. This can be successful because in the case of low capacity utilisation, the fiscal multiplier is larger, and because of the balance sheet adjustment of the private sector, the crowding-out effect of fiscal policy is not as intense, while the inflation risk is also low. Koo emphasises that fiscal stimulus must be maintained for several years even after the completion of the balance sheet adjustment, as the sudden withdrawal thereof may revive deflationary risks. This is attributable to the fact that those agents who had to adjust their balance sheet will be under the psychological effect thereof, even after completing the process and they are reluctant to become indebted once again.[4] In addition to *Koo, Rogoff* (*2015*) also emphasises that initially fiscal policy was effective in crisis management, but that tightening was introduced prematurely, as a result of which the recovery took a "U" rather than a "V" shape.[5]

Borio accepts[6] Koo's diagnosis, i.e. considers the lengthy recovery as a consequence of the balance sheet crisis. *At the same time, the colleagues of Borio and the BIS*[7] *point out that the interaction between the real economy and the financial cycles played a key role in the outbreak of the financial crisis.* Prior to the financial crisis, stable growth was seen, and at that time it seemed to be sustainable, with low inflation. At that time, economic agents and decision-makers did not identify signs of overheating because of the moderate domestic inflation and wages, which did not start to rise as a result of the mass entry of new producers to the market and the intensive global labour market competition. Despite prices of financial assets, real property and commodities indicating overheating, these products with volatile prices were not considered reliable economic indicators. The lessons from the financial crisis underlined that movements in both real economy and financial cycles, and especially their impacts on each other, need to be considered in making decisions on economic policy.

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[4] This is confirmed by previous experiences. For example, following the crisis in 1929, agents performing balance sheet adjustments did not take any further loans during their lifetimes. Another example is the case of Japan, where the balance sheet adjustments of the companies were finished around 2005, but there is still no sign of their improved willingness to borrow, even with the present historically low interest rate level.

[5] Most forecast producers thought that the recovery, once started, will take a V shape. Finally, however, it took a U shape, as expected by several academic economists who studied the previous financial crises and loan cycles.

[6] *Borio (2012), p. 16.*

[7] *Borio (2012), p. 14, BIS (2014), p. 65-68, BIS (2015b), Chapter III.*

Accordingly, economic policy-makers must consider financial stability considerations in formulating and implementing strategy, i.e. the real economy and financial cycles should behave in a more symmetric way both during the recovery and recession phases. In the case of macroprudential policy, for example, this can be implemented easily, with the appropriate use of an anticyclical capital buffer or debt brake rules. Central banks may implement a more symmetric monetary policy if they start to restrain overheating as early as the recovery phase, or if recession comes, they do not react with quick and extensive easing. Borio and his colleagues think that asymmetric economic policy played a significant role in the development of the present and previous crises,[8] because during the recession the strong easing and supportive policies put an end to incentives for writing-off and rescheduling bad loans, and therefore the next, recovery phase of the financial cycle started from a higher debt level, which continuously strengthened the cyclical fluctuations and increased the costs of the following recessions.

In the respect of fiscal policy, a symmetric economic policy reaction means that management of the balance sheet crisis cannot be successful with fiscal expansion alone, because such expansion (similarly to monetary policy) will generate even bigger future bubbles and financial crises, in addition to the temporarily useful stabilisation function. Therefore, if there is still room for manoeuvre in fiscal policy, it should not be used for the general stimulation of aggregate demand, but rather to support the balance sheet adjustment of the private sector in a targeted manner, i.e. for cleaning, capitalising and restructuring the balance sheets of banks, while in the case of the non-banking sector, for debt mitigation or rescheduling. Apart from Borio, Rogoff (2015) also emphasises that economic policy decision-makers should have paid more attention to writing off debts and to the restructuring and recapitalisation of the banks.

The interactions of real economy and financial cycles are important also because in a financial recovery, in addition to overheating, *the allocation of real resources may be permanently different from the optimal, and even from an allocation that can be sustained over the long term*. In that case, the recovery from the crisis is slowed down not only by the balance sheet adjustment, but also by the real economy adjustment; in the course of this, the re-allocation of physical capital and human capital and labour can be a time-consuming process, and hence longer-term adjustment is needed to reach the growth rate of the period before the crisis (for more details, see *MNB 2015*).

[8] According to Borio, the economic policy responses to the earlier smaller bubbles, for example the policy pursued during the dot.com crisis, contributed to the present crisis (*Borio 2012*, p. 23; *BIS 2014*).

4. Long-term explanations: possible real economy and financial factors

4.1. Real economy explanations: imbalance of savings and investments

In a study that generated keen interest, Lawrence Summers[9] recalled a hypothesis from the period before World War II, referred to by Hansen as "secular stagnation".[10] He also acknowledges the importance of the explanation related to the balance sheet crisis, described in the previous section, but he believes that it only partially explains the current processes. *In his view, the economic dynamism of the advanced regions already faltered before the crisis and with the passing of the crisis low growth should be expected even over the horizon of a decade. Summers thinks that the present protracted slowdown is caused by structural and real economy changes.* The real economy problems underlying the decelerating growth in the pre-crisis years were concealed by the fact that the growth took place in parallel with the development of the financial bubble and imbalances, while there were no signs of overheating, due to the low inflation. Summers finds that the joint maintenance of satisfactory growth and financial stability was already becoming more and more difficult before 2007 in the developed countries.

In order to the illustrate the problem, he cites the estimate prepared by the Government Accountability Office (GOA) before the crisis, in 2007, according to which the output of the USA by 2014 should have been 10 per cent higher. About half of the shortfall may be blamed on the crisis, while the other half of it is attributable primarily to the unrealised investment, and only a small part of it to the decrease in the "total factor productivity" interpreted as technical progress.[11] Decelerating potential output entails a decrease in the equilibrium real interest rate.[12] The low interest rate, coupled with low inflation, complicates the work of

[9] Former Secretary of the Treasury of the United States and chief economic advisor, President of Harvard University and Chief Economist of the World Bank.

[10] *Summers* (*2014*) Hansen defined his thesis in the 1930s in the USA, but the war-time prosperity of subsequent years put it in the background.

[11] Here, Summers uses the already established terms of potential output estimates based on a production function. Thus, the change in output may be influenced by changes in employed capital and labour, or a residual interpreted as technical progress, which cannot be attributed to the separate contributions of the previous two production factors. This residue is usually interpreted as the efficiency of the use of the two other factors and is called full factor productivity or multi-factor productivity. Although it is a widespread procedure which is regularly used by international organisations, central banks and other analysts, the approach has been seriously criticised for decades in both theoretical and empirical terms. Felipe and *McCombie's article* (*2010*) and *book of studies* (*2014*) offer a useful summary of this issue. One of the key conclusions is that full factor productivity estimates are based on the concept of the production function, but the latter demands assumptions which are not satisfied in a modern economy. Therefore, the output per capita (labour productivity) distribution is a mere quantitative accumulation of factors, and the contribution of the efficiency of their use is questionable and in many cases rather misleading.

[12] The equilibrium or natural real interest rate is the market rate with which the economy is neither overheated nor overcooled. In other words, the natural interest rate ensures the full utilisation of capacities, while inflation is in line with the target. It is worth noting that this term is inseparable from the production function concept, so the reservations identified in the previous footnote apply to it in the same way.

the central banks, which – in addition to trying to achieve the inflation target – aim at facilitating economic and employment growth, without jeopardising financial stability. Put differently, the objective is to ensure that savings and investments are balanced with an interest rate that ensures full employment.

In Summers' views, investment demand will lag behind savings over the long term, and therefore the equilibrium interest rate will remain persistently low, and economic growth will remain slow. *Accordingly, inflation may also remain structurally low, which increases the risk of a situation in which central banks are unable to react with proper easing in the case of negative inflation shocks.* And, indeed, *Teulings and Baldwin (2014)* define permanent stagnation as a situation like that. This can be explained by the following changes in developed countries (the first three points explain the drop in investment demand, while the last two explain the increase in savings):

i. Slower population growth: in the developed countries, and in China too already, population will decrease or stabilise. If the population, including the ratio of people of working age shrinks,[13] the existing capital holdings will be relatively high compared to the number of employed people. This will reduce investment requirements, because there will be no need to fully renew the existing capital holdings. Therefore, investment and loan demand will fall, and that reduces the neutral interest rate.

ii. Slower capital accumulation and investments: In the modern economy, economic sectors that do not require large capital investments will have a bigger weight. These are for example Apple or Google, as these companies are among the largest in the world, they have huge free financial assets, and their developments do not require significant physical capital investments, which also reduces investment loan demand.

iii. Technological innovation and change in relative prices: Partly for related reasons – because of the spread of information technology – the relative price ratio of capital goods and consumer goods has changed. Capital goods have become relatively cheaper,[14] and thus the same output level can be reached with less investments (lower investment ratio). The result again is reduced demand for investment loans. It is true, though, that these companies spend more on factors such as human capital or intellectual products (software, research and

[13] If we take the indicator that also considers qualifications (e.g. human capital), the series of generations with higher qualifications seems to be coming to an end. In addition, the increasing activity of women may also soon come to an end, as a consequence of which the ratio of people of working age may not increase with the same dynamics.

[14] According to some estimates, in the past thirty years, the price of capital goods fell by almost twenty per cent compared to consumer goods. If we consider quality changes as well, the relative price reduction is even larger. See *Eichengreen* (*2015:68*).

development) which do not count or only partially in the investments calculated in statistics.

iv. Increasing inequality of incomes: The distribution of incomes is shifted towards the direction of people with higher incomes, who have a greater willingness save. Thus, the ratio of structural savings increases in the economy, which reduces the neutral interest rate.

v. Ageing: With the ageing of the society, the number of years spent in retirement increases, and therefore savings need to be increased, which reduces the natural interest rate (also, as the willingness to consume is lower in old age, and this phenomenon also reduces investment demand).

vi. Uncertain macroeconomic policy: The poor predictability of economic policy decisions may also encourage economic agents to increase their savings.

Due to the factors listed,[15] savings in developed countries are structurally higher than investments, which results in a low neutral (real) interest rate. This, coupled with low inflation, substantially narrows the leeway of monetary policy, which ultimately leads to negative real interest rates (and eventually also to negative nominal key interest rates). However, the presently loose monetary policy of the Fed and other leading central banks result in financial stability problems. Summers sees the following possible solutions for permanently slow growth:

i. He thinks it is possible to follow an approach in which nothing special needs to be done, as the supply side will also adjust to the decreasing demand with time. In Summers' view, Japan acted like that for many years, and so did the USA in the past three to four years. This is exactly what is reflected in the potential output estimates, as its reduction can be mostly attributed to reduced capital stock. For the sake of the comparison, and for the evaluation of social welfare, the capital stock per capita is a better indicator, although the transition to a stable economy with a smaller population is not necessarily smooth this way either (e.g. the pension system may have to be modified).[16]

ii. Another solution is to adjust market rates to the reduced neutral interest. This is one of the interpretations of the Fed's policy in the crisis. Summers finds this policy reasonable for a certain time, but also warns of its downsides: the danger of bubbles developing in asset prices, the impact on income and asset

[15] See *MNB* (*2015*) for more details.

[16] Explaining the results of the studies produced jointly with Goodhart, Pradhan actually said that the labour oversupply of decades has come to an end, and that reduced prices and inflation through a number of channels. According to their forecast, companies will have to face labour shortage in the future, which will result in the reversing of income distribution, from capital incomes to labour incomes, and inflation pressure may replace disinflation, and the shortage of labour will force increased productivity (*Pradhan 2015*).

distribution, and the danger that unviable companies may also easily survive amidst easy refinancing conditions.

iii. From the possible economic policy answers, Summers supports ones that aim at increasing aggregate demand. To this end, for example, he would allow for the increase of the budget deficit in the USA, and he thinks that budget restrictions are not advantageous. Aggregate demand can be supported in several ways, for example, from the various tools to facilitate exports to public investments in infrastructure. Referring to the simulation with the Fed model, Summers claims that a budget deficit increase of one per cent maintained for five years would permanently increase the output and reduce the debt rate after the initial growth (*Summers 2014:72*).

Summers' diagnosis was basically adopted by the IMF 2015 spring World Economic Outlook, which agreed with the key explanation factors. Oliver Blanchard made similar statements at the press conference that introduced the publication. At the same time, others reject the danger of permanent stagnation in connection with the developed countries.

Ben Bernanke, former Chair of the Federal Reserve, does not deem the initial issue, i.e. the problem of too low interest rate, to be convincing (*Bernanke 2015a; 2015b*). He finds it logically impossible for the real interest rate to remain negative in the long run, because in that case even extremely low yielding investment projects break even and as such credit demand will be infinite. In addition, Bernanke mentions that if there are not sufficient investment opportunities in the USA, the companies can look for investment opportunities abroad, especially in an environment of extremely low interest rates. Accordingly, one of the key difference is that the explanations of Summers' thesis are basically limited to the USA and the developed countries and ignore global considerations. According to Bernanke, the present low interest rates should be regarded as the temporary backwash of the balance sheet recession rather than permanent stagnation.

According to Bernanke, the imbalance in savings and investments is attributable to excessive savings ("savings glut") and not to insufficient investments. Accordingly, if excessive savings can be reduced, the problem of excessively low interest rates will be resolved. Bernanke believes that one of the main reasons for the savings glut is the excessive current account surplus of certain countries. Before the crisis, China had the highest export surplus, while now it is Germany accompanied by a number of smaller European countries. Bernanke is already inclined to see signs of adjustment. China's surplus has already decreased significantly, and in parallel with that the demand for securities issued in US dollar also dropped. The increased external surplus of the eurozone may be deemed cyclical: it soared mostly due to

the involuntary adjustment of the countries under market pressure, which will decrease as a result of the recovery.

4.2. Limitations of real analysis: explanations related to the changes in the financial structure, corporate financing and corporate governance

In the debate on permanent stagnation, both Summers and Bernanke started from the required balance of savings and investments, which is ensured by the equilibrium interest rate. They assume that agents make their decisions on the basis of real variables, with inflation filtered out. The banking sector mediates the savings considered as real variable to loan applicants who intend to make investments. Among the possible explanations described in the previous section, the debate is about the issue whether interests rates are low because of the high savings or the low investments, compared to each other.

This widespread approach has been strongly debated recently by economists in mainstream economic policy (*Borio–Disyatat 2011; Nealy et al. 2014*). Lending by banks is not limited by the already existing savings and the savings they collect, the limitations of lending are to be looked for elsewhere (*Nealy et al. 2014*). Interest rates do not ensure the balance of savings and investments in real terms either, but reflect the preferences in liquidity and the uncertainty about the assumption of credit and market risks (*Tily 2013; Szalai 2014*). Extending this recognition to the international economy, global imbalances cannot be attributed only or primarily to the imbalances of savings and investments, or the current accounts.[17] In the light of all that, regarding the restrained investment activity which was observed already before the crisis, there have been other explanations, in addition to the arguments of the supporters of permanent stagnation and the savings glut, and most of them can be related to changes in financial structure and corporate governance.

4.2.1. Short-termism

In the midst of the uncertainties of the crisis, demand for liquidity has grown and the abstinence from investments representing long-term financial commitments can be relatively easily explained. However, already before the crisis it was observed that companies (primarily major enterprises) had a significant volume of liquid assets and corporate savings,[18] because they used a smaller part of their profit on the development of their own physical and human capabilities and on the financing of research and development activities. Instead, they spent an

[17] In the modern world economy, capital flows do not simply compensate for current account deficits in a "passive" way, but independently of them, or in a way that determines them, play an active role, i.e. the gross flows have at least the same influence on financing conditions (*Borio–Disyatat 2011; MNB 2014*).

[18] IMF (2006) noted that in 2003–2004 corporate savings in the G7 countries were twice as high as the current account surpluses accumulated by less developed countries, which represented a "paradox" capital flow from the less developed towards the developed.

increasing part of the funds on financial market activities, payment of dividends to shareholders, and the amounts used for share repurchases that served as emoluments to company managers increased dramatically.[19] *This shows that restrained innovation and decelerating investments are not caused by the lack of financial sources only.* Both American and European large companies keep liquid assets over one trillion USD or EUR in bank deposits with very low (sometimes negative) interest rates, and in similar, not really sophisticated investment assets.[20]

Venture capital companies, which play an important role in the USA in the financing of innovations, are less keen to undertake financing research projects in early phases and prefer to focus on less risky phases which are closer to market entry (*Mazzucato–Wray 2015*). In light of this, the government plays an increasingly important role as the party financing innovation and the party determining development directions. However, in developed countries, development banks have been gradually terminated or their activities have become more limited. In the course of fiscal adjustments, governments often restrain investments that influence research and development and long-term compatibility, while the private sector, in spite of its significant sources, does not finance the phases that involve the highest risks, at least not to the extent it did in previous decades. Mazzucato explains in a number of studies that in the development of innovative products that are considered as the most successful products, the states – mainly the USA – played a determining role, and spent enormous funds on these products,[21] while successful companies attempt to reduce their tax burdens. However, when individual products achieve market success, the states have a relatively low share in the financial results. *As a consequence of all this, less research and development funds are created than necessary, as not enough funds from the results of the market utilisation of earlier innovations are spent on basic research, and this leads to moderate investment performance on the whole.*

4.2.2. The role of "active investors" in corporate governance

The earliest criticism of the so-called "shareholder value" management concept is related to the name of Lazonick (*Lazonick 1992*) and is now shared by more

[19] *Lazonick* (*2014a*; *2014b*), *Mazzucato and Wray* (*2015*). The 449 companies that belong to S&P 500, and that were present on the stock exchange from 2003 to 2012, spent 54 per cent of their total profit on open market share repurchase, and 37 per cent on paying dividends. This way not much of the profit was available for financing developments. See also the comments of Haldane, the chief economist of the Bank of England on the short-termism of markets (*Haldane 2011*; *2015*).

[20] In order to indicate the order of magnitude, we wish to mention that in order to boost bank lending and corporate investments, the ECB wishes to increase its balance sheet by September 2016, by purchasing securities in the value of one trillion euro, under an extended asset purchase programme. See *Tett* (*2015*), *Long* (*2015*), *Association of Financial Professionals* (*2015*). It should be noted that, small and medium-sized enterprises – which may have very different financial positions – play an important role in employment in the national economy, but not in investment.

[21] These companies include some that are considered as the most innovative ones, such as Google, Amazon, Apple, Facebook etc.

and more people.[22] Rejecting the optimism of *Jensen* (*1991*) and followers, he used data to explain that management incentives in the form of share options did not result in the strengthening of the long-term approach of the management (*Lazonick 1992; 2015*). On the contrary, the management has a number of tools to influence the share prices of its own company with methods that might as well be against the long-term interests of the company. Rewarding the management with share options in their own company was in fact the financing of their retirement and did not result in expanding investments and strengthening the interests of the management in the long-term viability of the company.

The OECD report of this year on corporate outlooks (*OECD 2015*) dedicated a separate chapter to this subject. They point out that in principle by requiring continuous profitability "active shareholders" or "impatient" investors (pension funds and other institutional investors) may play a positive role against corporate governance that has become too comfortable and fails to grab the business opportunities. However, they add that *in some of the cases, the same active shareholders may set a higher hurdle rate against the return of investments*. In an environment with as low financing costs as experienced nowadays, managers are willing to give in to pressures for short-term yield expectations and pay dividends even from loans, even at the expense of investments which would ensure long-term competitiveness. The OECD considers this a mechanism of the same value as the increase in the effective risk premium, which increases the return expected from investments, i.e. the return threshold. They show that the majority of companies' operating cash flow is spent on rewarding active shareholders and on share repurchases, which is unfavourable for investment activity (*Figure 7*).

In the views of the OECD, one of the most important current mysteries is that as a consequence of loose monetary conditions following the crisis, investors detect low risks on the financial markets, while companies sense high risks when they make investment decisions. Therefore, the hurdle rates related to new investments are so high that in spite of the historically low riskless nominal interest rates economic growth is restrained in several regions because of the lack of investments.[23] One of the biggest current challenges for economic policy-makers is how to achieve growth in investments and avoid the creation of financial instability and bubbles in the meantime.

4.2.3. Use of corporate borrowings

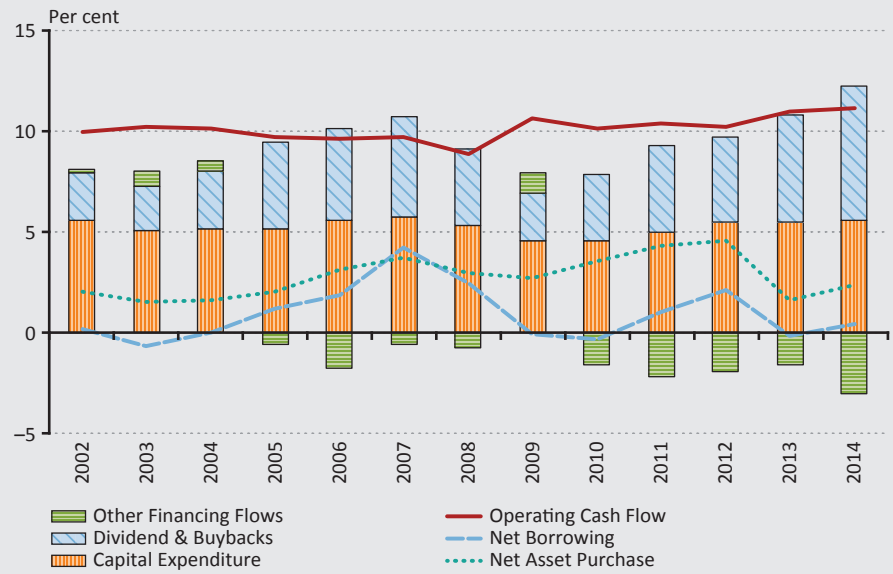
The OECD report also states that in the USA and Europe *companies would be able to finance investments from their net incomes (operating profits), and enough*

[22] *Aglietta* (*1995*), *Mazzucato* and *Petta* (*2014*), *Mazzucato* and *Wray* (*2015*), *Haldane* (*2015*).

[23] *ECB* (*2015:31*)

funds would remain for dividend payments and share repurchases[24] (*Figure 7*).[25] The problem is that corporate borrowings (which decreased significantly during the crisis and are only gradually increasing) *did not primarily finance capacity-expanding investment, but rather dividend payments and share repurchases*. Having examined the finances of large American companies for a longer period, Mason came to the conclusion that compared to earlier decades, companies spend and take out external loans not on the financing of investments, but rather on dividend payments and share repurchases (*Mason 2015*).

Figure 7.
Expenditures and funds of industrial companies in the USA as a percentage of net sales



Source: ECB (2015:47)

4.2.4. High corporate real interest rates

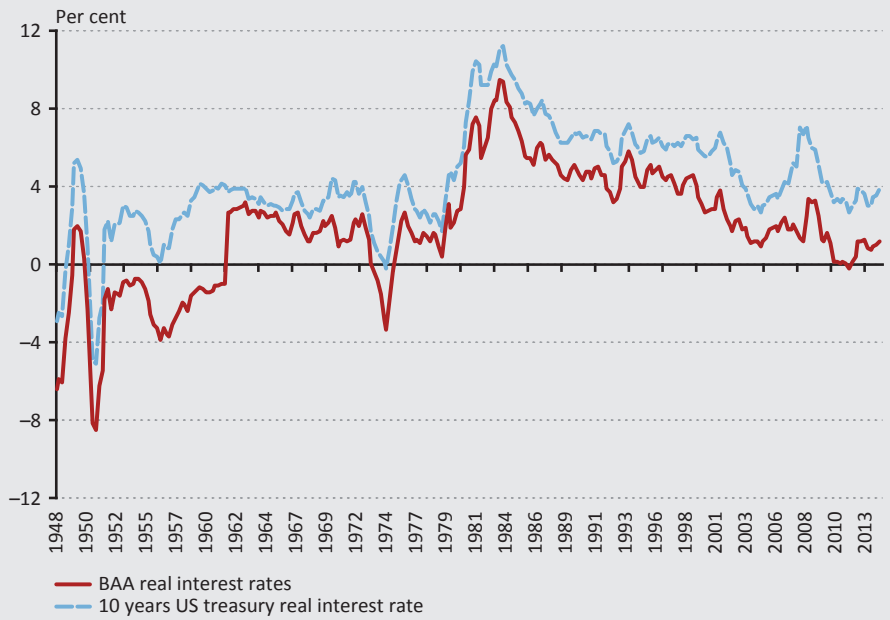
Tily draws attention to the point that *unless we are looking at the real interest rates of corporate bonds with the best credit ratings, we cannot talk about especially low capital costs at all.* In his calculations, even nowadays, with the historically low nominal rates and with key rates that are close to zero or sometimes negative, real interest rates on US corporate bonds with BAA rating are around 2–3 per cent, and they have just reached the *maximum of the golden age of growth* which lasted from World War II to the 1970s, i.e. the fast economic growth of the "golden age"

[24] Share repurchases are especially high in the USA, the United Kingdom and Switzerland, but represent a significant item in other European countries as well.

[25] A similar trend is also valid for large European companies, see *OECD (2015), p. 48, Chart 2.12.*

was characterised by lower real interest rates (*Figure 8*). On the other hand, in the years preceding the crisis, both real interest rates and nominal interest rates were higher. Taking a closer look, we can see that in periods characterised by deregulation, liberalisation and privatisation, real interest rates were high, which is just the contrary of what is expected from the measures.[26]

Figure 8.
Historical development of real interest rates



Source: Tily (2015a)

In the 1980s, deregulation, liberalisation and privatisation were expected to facilitate the optimal allocation of real resources and financial risks, to strengthen motivation by increasing competition and reducing costs of funds, and to improve competitiveness and boost investments. *However, looking back we can see that deregulation, liberalisation and privatisation in their own right*, without the proper adjustment of macroeconomic policy, *entail serious risks: the funds available for the real economy and for the financing of investments did not necessarily become cheaper, and the allocative efficiency was also poorer than expected, which may have played a role in the outbreak of the financial crisis in 2008*.[27] These assessments link the falling growth rate in developed economies to this

[26] Tily cites the regular IMF publication of 1985, which calls it the most stunning mystery that corporate short-term and long-term rates were historically high in spite of the measures (*Tily 2015a, footnote 5 and 2007/2010, p. 293*).

[27] *Cecchetti et al.* (*2015*), *Cournède et al.* (*2015*), *Zingales* (*2015*).

transformation.[28] Earlier, we indicated that the corporate sector still has significant liquid assets, while investment activity remains below the level from before the crisis (*IMF 2015b*). However, this can only partially be blamed on balance sheet adjustment, as investment activity was low before the crisis as well, because of high real interest rates. *Tily emphasises that in the period before the crisis, high real interest rates did not offer proper incentives for robust investment activity, while high nominal interest rates also contributed to the continuous increase in debt portfolios.*

Tily refers to his own research work (*Tily 2007/2010*), in which he explains that Keynes also considered monetary policy important (as opposed to later interpretations), and did not focus exclusively on fiscal policy. This refers to the period in the age of Keynes, which can be characterised with stagnation, when *Keynes himself attempted to create a monetary policy strategy framework which supported high investment activity*. *In order to achieve that, the monetary policy frameworks have to ensure low nominal and real interest rates permanently and in a predictable way.* In Keynes' analytical monetary policy framework, appropriate monetary policy is able to influence real interest rates on a permanent basis. Present analysis frameworks – such as the above debates on the theory of permanent stagnation – usually lack this approach, as they say that real interest rates are determined by real factors only (e.g. the marginal productivity of capital).

The monetary analyses going beyond the real analyses applied by the participants of the debate on permanent stagnation – as indicated by the above discussion which is far from complete — offer additional recommendations to boost permanent and sustainable growth. They suggest structural changes which create *"patient" financing for both basic research and the development into a market product and market launch*, in which the state must play a major role. In addition, corporate profits should come from the basic activity, and the incentive system of corporate managers should be transformed in such a way that it encourages behaviour that results in sustainable and fast growth. Companies should not only maximise shareholder value, but should ensure the long-term growth in the well-being of other stakeholders (e.g. employees, customers, suppliers, etc.).

This article does not endeavour to discuss the recommendations for such comprehensive changes.[29] We merely wished to draw attention to the fact that even before the crisis, there were processes – not only in the real economy, but in the financial and monetary areas as well – which pointed in the direction of permanently slow growth or even stagnation. *Therefore, a simple return to the liberalised financial and banking system in place before the crisis and to the*

[28] See for example *Lazonick* (*2014a*) and *Mazzucato* and *Penna* (*2014*).

[29] Interested readers may gain insight into these recommendations among others from the works of Mazzucato et al., Lazonick and Haldane as referred to above.

financial incentives of that time does not guarantee that deceleration or stagnation can be avoided.

Although the historically loose monetary conditions and the application of non-conventional tools are useful in reducing the costs of the crisis, they can achieve only partial success in reaching a satisfactory growth rate. *As shown, the main reason for poor investment activity can hardly be the lack of corporate financial resources in itself, at the macroeconomic level. Instead, the current restrained investment activity and overly low inflation can be explained by a lack of confidence in the long-term existence of a environment characterised by weak growth prospects and low nominal and real interest rates.*

This suggests that the analytical framework is changing in such a way that the operation of the financial sector and the behaviour of its agents has fundamental importance in macroeconomic processes. Thus, the fundamentally real models which were widely applied before the crisis and are still often used cannot be effective for describing the economic processes (*Buiter 2009; Haldane 2012*). Although the role of the financial sector is becoming more and more accepted after the crisis, its inclusion into real models cannot be a solution in itself. Frictions modelled in this way only explain why the non-banking private sector does not get enough loans. However, we indicated above that the main reason for the low investment activity of large companies in developed countries is not the lack of financial sources. The solution could be a return to the monetary concept related to the names of Wicksell, Schumpeter and Keynes, as in that analysis frame, the financial sector is in interaction with the real sector, which does not necessarily strives for a balance.[30]

5. Summary

The new environment following the crisis results in new challenges for monetary policy, which can address these challenges only if it is able to properly diagnose the reason for low inflation and slow growth, and find the appropriate tools for raising inflation to the target. The article reviews the short, medium and long-term factors that may be behind the current developments.

In connection with falling oil prices, short-term explanations received greater attention in 2015. Since the middle of 2014, the price of the Brent oil has decreased significantly, which was most frequently explained by the increase in the American shale oil extraction and the moderate global demand environment. However, it is widely believed that real economy processes alone did not justify the price changes, and that they may have been amplified by market factors affecting the oil and commodity markets. This may indicate that movements in commodity prices,

[30] More details, see *Aglietta* (*1995/2005*), *Borio et al.* (*2011*), *Borio* (*2012*), *Minsky* (*1986*).

including oil prices, are also strongly influenced by expectations on the financial and speculative markets. It can be seen that the prices of other commodities showed similar volatility in the past years, which implies that short-term inflation surprises are caused not only by the features of the energy market. At the same time, core inflation indicators, which eliminate food and energy prices, were also low, raising the question whether inflation trends are dominated by medium-term or long-term factors.

According to the approach related to medium-term factors, the balance sheet crisis after 2008 and the ensuing balance sheet adjustments by economic agents explain the current low inflation environment which is coupled with moderate growth. This view emphasises that in the years before the crisis, economic growth based on the significant indebtedness of economic agents, which attempted to adjust their balance sheets as soon as possible after the asset price bubble burst and to spend their extra income on reducing their debts, while refraining from making new investments from new loans or using their own resources. In Koo's views, this phenomenon may be mitigated by fiscal policy playing an effective role in crisis management and supporting the increased profits of economic agents with fiscal stimulus of proper extent and duration, at the cost of the indebtedness of the budget. The BIS staff adds that the interaction between the real economy and financial cycles played a key role in the outbreak of the financial crisis, and therefore this aspect will have to be systematically considered in the future, in the course of formulating strategies and implementing economic policy. In practice, this means that individual policies have to behave more symmetrically in both the recovery and the recession phases of the real economy and financial cycles.

One group of long-term explanations explains the low inflation and the lengthy recovery with real economy factors, including the imbalance of savings and investments. Although the theory of permanent stagnation associated with Summers acknowledges the importance of Koo's concept of the balance sheet crisis, he considers Koo's concept to be only partially suitable for explaining current developments. In his view, the economic dynamism of advanced regions was already interrupted before the crisis and with the passing of the crisis low growth should be expected even on the horizon of a decade. Summers says that a number of factors (e.g. slower growth of population and technological development, etc.) may play a role in the fact that savings are structurally higher than investment in the developed countries, which results in low neutral (real) interest rate. In this case, there is an increased risk that in the case of negative inflation shocks, central banks are unable to react with proper easing in order to stimulate the economy. Summers says that one of the possible economic policy answers to the permanent stagnation is to boost aggregate demand by increasing the budget deficit. As opposed to Summers, Bernanke does not accept the hypothesis of permanent stagnation: he thinks it is logically impossible for the real interest rate to stay

negative on a permanent basis. He believes that the imbalance between savings and investments stems from the excess size of savings, and if the too high current account surpluses decrease, the problem of too low interest rates will be solved.

However, more and more people emphasise the limitations of these real analyses. These approaches also underline that low investment activity was already typical before the crisis, but it was caused by financial factors, e.g. changes in the financial structure, corporate finance and corporate governance. On the one hand, companies have a significant amount of liquid assets and savings, but they spend only a small portion of that on research and development or investment activities (shorter return horizon). In light of this, the state plays an increasingly important role as the party financing innovation and the party determining development directions. On the other hand, the role of "active investors" has changed in corporate governance, as they expect continuous profitability, but their yield expectations set a higher threshold for the return of investments, which may also lead to the restrained investments. In addition, it was more and more typical before the crisis that when large companies took out external loans, which served the financing of investments to a lesser and lesser extent, these loans were used for dividend payments and share repurchasing. Finally, we point out that although nominal rates are historically low, the real interest rates of corporate bonds are relatively high, which is another obstacle to the expansion of investments.

All in all, we can say that – based on the monetary and financial analyses that go beyond the real analyses – macroeconomic frameworks and structural changes are required to realise "patient" financing for basic research and development, and create growth-supporting incentives which can be maintained over the long term. This points to a transformation of the analytical framework in which the financial sector interacts with the real sector. Experience shows that it is primarily not the lack of corporate financial resources that hinder investment activities, but rather the poor growth prospects and the lack of confidence in the maintenance of an environment with low nominal and real interest rates that explains the slow recovery and the low inflation environment.

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Micro- and macroprudential regulatory instruments compared across the European Union

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The study investigates how active Hungarian micro- and macroprudential regulation is in an international comparison. Based on national regulatory notifications, our analysis summarises the types of national derogation and the reasons for their application, and presents the forms in which they are applied in individual Member States. Additionally, it provides an overview of the relationship of regulatory activity with the risk profile of each state. As a consequence it is stated that Hungary has shown outstanding activity in terms of both micro- and macroprudential regulation, due to the significant number of systemic risks.

Journal of Economic Literature (JEL) Classification: F38, G21, G28, N24

Keywords: banking regulation, European Union, national derogations

1. Introduction

Over the past 25 years, the European Union has made spectacular efforts to unify the regulation of the financial sector and in particular credit institutions. The unified regulation is provided partly through directives to be implemented on a mandatory basis, and partly through directly applicable regulations. The EU regulation setting out the prudential requirements for credit institutions and investment firms effective from 2014 (the so-called CRDIV/CRR[1] regulation), and the consequences of the economic crisis calling for these regulatory efforts have significantly reshaped the regulatory environment. Given the need to prevent the reoccurrence of the excessive risk taking characterising the pre-crisis period and of the resulting systemic risks, the micro- and in particular the macroprudential regulatory instruments have gained significance, and the adoption of CRDIV/CRR

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[1] CRDIV: Directive 2013/36/EU of the European Parliament and of the Council of 26 June 2013 on access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms, amending Directive 2002/87/EC and repealing Directives 2006/48/EC and 2006/49/EC,
CRR: Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation, available at http://ec.europa.eu/finance/bank/regcapital/legislation-in-force/index_en.htm

established an integrated regulatory framework in Europe. In both fields, however, derogations remain apparent in the regulatory practices of individual countries, primarily owed to the differences in their institutional systems and in the risks faced.

Our comparative analysis scrutinises these derogations: focusing primarily on the activities of EU Member States, we assess the differences between individual countries in terms of their application of micro- and macroprudential regulatory instruments. Based on the assessment, several groups of countries can be distinguished, each showing varying levels of activity in both fields due to the differences in their risk profiles. In our assessment, we relied primarily on the information published by European authorities of banking supervision.

2. National derogations in microprudential regulation

2.1. Background

National derogations from the standardised EU banking regulation may be considered in both a narrower and a broader sense. In a narrower sense, national derogations are understood as differences expressly allowed under CRDIV and CRR, where each Member State, the national supervisory authority, or the credit institution applying the rule determines whether to make the derogation concerned. In a broader sense, national derogations include all additional regulatory derogations which may be made by Member States in the absence of common EU regulations, and are closely related to the operational rules of credit institutions (derogations in accounting, corporate and civil law). In Section 2.2, this paper focuses on the national derogations provided for in CRDIV/CRR, while Section 2.3 mentions additional national derogations outside the scope of CRDIV/CRR.

Some of the national derogations provided for in CRDIV/CRR are relevant only to one country or a few countries, and were generally included in the legislation so that the countries concerned did not need to apply drastic changes to previously developed financial products (e.g. Finnish building societies, the Danish mortgage bond market, French special purpose vehicles). Other national derogations were included in the legislation because legislators had not been able to reach a final agreement on certain issues, and in the absence of an agreement, they dispensed with the consistent application of the rule concerned.

Although national derogations weaken competitive neutrality, they smooth differences between EU and national legislation and practices. As a positive effect of national derogations, this enables the extremely complex system of requirements set out in CRR to be applied in all Member States. Since these differences are expected to prevail in the long term, the question arises whether the number of options and national discretions may decrease in the near future.

In 2015, the EU Commission issued a delegated act on the subject of liquidity regulation to specify a number of additional national derogations. Since these have not been aggregated at EU level to date, they will not be addressed in our paper.[2]

2.2. National derogations in microprudential regulation allowed under CRDIV and CRR

As indicated in the foregoing, while the EU recognises the necessity of national derogations, it has been making attempts to confine them within a regulated framework. The system of national derogations had also been operational previously, but the system of EU legislation clearly points towards standardisation. Among other features, this is indicated by the progress made since the initial period of banking regulation, where common requirements were set out in minimum harmonisation directives: today, the vast majority of EU requirements are set out either in maximum harmonisation directives, or in directly applicable regulations. The establishment of the single supervisory manual and of the banking union has clearly pointed to uniformed regulation and enforcement.

Nevertheless, several possibilities still exist for derogations the fundamental rules laid down in the CRDIV and CRR. These include derogations granted to individual institutions[3], Member States' discretionary decisions, as well as options and national discretions of competent authorities.

In derogations granted to individual institutions, in the cases specified in CRDIV/CRR, derogations from the general rules may be made with regard to the specific circumstances of an institution, normally at the request of the institution concerned. Member States' discretionary decisions include derogations where the decision is made by the Member State itself rather than the supervisory authority, and is incorporated into an act or other lower-level national legislation. The two main groups of options and national discretions include the transitional measures provided for by national supervisory authorities, and the national derogations required for the continuous application of the CRR.

In determining how strictly national derogations are applied by the regulatory authority and the MNB in Hungary in comparison with other EU Member States, the following summary observations can be made:

i. As regards derogations granted in individual cases, we have no means to formulate a meaningful opinion at this point, since no information is available on the derogations made by individual EU Member States in such cases, and

[2] *Available at http://eur-lex.europa.eu/legal-content/HU/TXT/HTML/?uri=CELEX:32015R0061&qid=1446538552039&from=EN*

[3] For the purposes of this paper, institution shall have the meaning ascribed to it in CRDIV, comprising credit institutions and investment firms.

the MNB's practice also has to be finalised yet. In derogations granted to individual institutions, in the cases specified in CRDIV/CRR, derogations from the general rules may be made with regard to the specific circumstances of an institution. Since such decisions are adopted with regard to the specificities of the institution concerned rather than those of the Member State, this topic will not be addressed in greater detail in this paper.

ii. In the case of Member States' national discretionary decisions, the main decision-maker is the Ministry for National Economy (MNE), and the rules are established by Parliament on the basis of its bills (Member States may delegate their discretionary powers to other authorities as well). In the context of CRDIV/CRR, Hungary tends to opt for stricter regulations in some cases (e.g. maintenance of its own national liquidity regulations, imposition of reporting requirements on branches), and more permissive regulations in other cases (e.g. allowing for equity of EUR 1 million, individual exemptions from compliance).

iii. In connection with the transitional measures related to the CRR, the MNB Decree, with a few exceptions (such as share buybacks and the deduction of equity instruments issued for the artificial increase of own funds), gives Hungarian credit institutions the favourable alternatives provided by the CRR, regarding which a similar approach is generally taken by one-third of EU Member States. Due to recent amendments to the MNB Decree on transitional measures, the transitional rules have been reviewed, and from 2016 onwards, Hungary will definitely be among the EU Member States that apply stricter rules in this field.

iv. In the case of national discretions related to the continuous application of CRR, stricter derogations relative to the general provisions are applied by only few Member States for the time being. In Hungary, derogations in a stricter direction may potentially be made by the MNB in respect of applying higher risk weights to exposures secured by mortgage, stricter criteria for the application of preferential weights, and stricter rules for large exposures to institutions; however, the decisions on these issues have not yet been adopted.

The European Banking Authority (EBA) has been playing a leading role in coordinating national derogations where the decisions are made by national supervisory authorities. One of the most important means of that is disclosure, as part of which the national supervisory authority notifies the EBA about the options and national discretions applied in the Member State concerned. The EBA collects this information and publishes it on its website (*EBA 2015*). Additionally, all national supervisory authorities, including the MNB in Hungary, publish such decisions on their own websites.[4] Although coordination by the EBA is primarily focused on derogations based on supervisory decisions, the information disclosed

[4] *http://mnb.hu/en/supervision/regulation/supervisory-disclosure*

also includes some Member States' discretions. The scope and structure of information to be disclosed by national supervisory authorities is governed by a specific regulation of the EU Commission[5]. The table published by the EBA lists a total of 68 such national derogations[6], including those available under CRDIV and those referred to the discretion of national supervisory authorities under the CRR. In a 2009 report, the CEBS (Committee of European Banking Supervisors, the EBA's predecessor) identified 152 such national derogations in respect of the capital requirements applicable at the time (*CEBS 2009*). As the CEBS report aimed specifically to propose means to the EU Commission for reducing the number of national derogations, the new regulations have clearly succeeded in doing so.

Following the establishment of the banking union, the European Central Bank (ECB) also became interested in ensuring that in countries of the banking union, national derogations should preferably be applied consistently, since the diversity of requirements across Member States would impair the effectiveness of a single European supervisory function. For that reason, the ECB collected the national derogations allowed under CRDIV/CRR, and developed proposals for their application by Member States. The ECB's material is soon to be released for public consultation, and is aimed at the achievement of consistent enforcement in countries of the banking union.

Information available on the EBA's website has been used to compile the following table, which provides a summary of how individual Member States have applied the most important national derogations in microprudential regulation. Items marked yellow indicate national derogations allowing stricter requirements, while those marked green indicate national derogations allowing more permissive requirements relative to the general rules of the EU. The sum of such regulations shows how active each Member State is in the application of national derogations.

As the information in the table is based on the provisions in effect in 2015, it is important to note that the MNB has amended its decree on transitional provisions as of 1 January 2016. From 2016 onwards, the decisions by the national supervisory authority provided for in the CRR in respect of transitional measures will not longer be in effect. Consequently, in essence the CRR will become fully applicable in Hungary without any further transitional measures (except for a few transitional provisions set out in the CRR itself). Following the repeal of these transitional measures, Hungary will join the countries that apply stricter national derogations.

[5] Commission Implementing Regulation (EU) No 650/2014 of 4 June 2014 laying down implementing technical standards with regard to the format, structure, contents list and annual publication date of the supervisory information to be disclosed by competent authorities according to Directive 2013/36/EU of the European Parliament and of the Council.

[6] Some sources refer to 103 derogations, depending on the method of selection.

Table 1
Application of key options and national discretions in individual EU Member States

	Key discretions	HU	BG	CZ	PL	RO	SK	CI	EE	HR	LT	LV	MT	SI	AT	BE	DE	DK	EL	ES	FI	FR	UK	IE	IT	LU	NL	PT	SE
National discretions by Member States in CRDIV/CRR	Waiver for credit institutions on the application of certain CRR prudential requirements on individual basis	Y	N	N	NA	Y	N	Y	N	NA	N	N	N	N	Y	Y	N	N	Y	N	N	Y	N	Y	N	Y	Y	Y	N
	Maintaining national liquidity requirements	Y	Y	N	NA	Y	N	N	N	Y	NA	Y	Y	Y	Y	N	Y	Y	NA	NA	N	Y	Y	Y	N	Y	Y	NA	Y
	Lower initial capital requirement for certain type of credit institutions	Y	N	Y	NA	Y	N	Y	N	Y	N	N	N	Y	N	N	N	N	N	Y	N	Y	Y	Y	N	N	N	N	Y
	Requirement of periodic reports from branches of credit institutions registered in another Member State	Y	Y	Y	NA	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N	Y	N	Y	N	Y	N
Transitional provisions of CRR	Transitional inclusion of unrealized gains	Y	Y	N	NA	Y	N	N	N	N	N	Y	Y	Y	Y	Y	Y	N	NA	Y	N	Y	NA	Y	Y	N	Y	Y	N
	Transitional deduction of unrealized losses	Y	Y	N	NA	N	N	N	N	N	N	N	N	Y	N	Y	Y	N	N	Y	N	N	N	Y	Y	NA	Y	Y	N
	Transitional deductions from own funds	Y	Y	N	NA	N	N	Y	N	N	N	N	NA	Y	N	N	Y	N	N	N	N	Y	N	Y	N	N	Y	Y	N
	Transitional deduction of deferred taxes	Y	Y	N	NA	Y	N	Y	N	N	N	N	Y	Y	N	N	Y	Y	Y	Y	N	Y	N	Y	N	Y	Y	Y	N
	Faster exclusion of capital elements which do not meet new CRR conditions	N	N	Y	NA	N	Y	N	Y	Y	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N
Options and national discretions for ongoing application of CRR	Higher risk weights or stricter conditions for exposures secured by mortgages on residential property	N	Y	N	Y	N	N	N	N	Y	N	N	Y	Y	N	N	N	NA	N	N	N	NA	N	Y	N	N	N	NA	N
	Higher risk weights or stricter conditions for exposures secured by mortgages on commercial immovable property	N	Y	N	NA	Y	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	NA	Y	Y	N	N	N	NA	Y
		N	N	N	NA	N	N	N	N	N	N	Y	N	N	N	N	N	Y	N	N	N	NA	N	N	N	N	N	N	N
	Lower large exposure limit for exposures to institutions	N	N	N	NA	N	Y	N	N	Y	N	N	N	Y	N	N	N	N	NA	N	N	N	N	Y	N	N	N	N	N
	Application of supervisory measures to institutions with similar risk profiles (CRD Art.103)	Y	N	N	N	Y	N	N	N	N	N	N	N	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N	Y
	Number of measures to make national regulation stricter	3	4	2	1	4	3	1	2	5	0	4	3	4	2	2	2	3	1	1	0	2	2	5	0	2	1	1	3
	Number of measures to make national regulation softer	6	4	1	0	4	0	4	0	1	0	1	2	5	2	3	4	1	2	4	0	5	1	6	2	2	5	5	1
	Number of measures	9	8	3	1	8	3	5	2	6	0	5	5	9	4	5	6	4	3	5	0	7	3	11	2	4	6	6	4

Source: based on EBA (2015a)

The most important discretionary decisions by Member States, the transitional measures, as well as the options and national discretions required for the continuous application of the CRR are described below.

2.2.1. Member States' discretionary decisions

Member States' discretionary decisions include derogations where the decision is made by the Member State itself rather than the supervisory authority, and is incorporated into an act or other lower-level national legislation. (For example, in Hungary the Credit Institutions Act regulates the items that may be exempted from the application of the large exposure limit.) CRDIV/CRR provide for a relatively narrow scope of such measures, given that EU legislation generally grant Member State derogations to national supervisory authorities. The most important measures include the following:

In CRR:

i. Maintenance of previous national regulations on the exemption of credit institutions affiliated to a central body from individual compliance with specific prudential rules of the CRR, provided that such regulations are not inconsistent with the provisions of the CRR. Based on data published by the EBA, 11 countries (including Hungary) have indicated their intention to apply this derogation. Since this type of derogation is primarily applied in countries where co-operative credit institutions exist and are subject to regulated integration, the derogation is expected to be sustained in the long term despite being applied in less than one-half of EU Member States.

ii. Member States have been authorised to maintain national liquidity requirements until EU-level liquidity regulations (LCR, NSFR) take full effect, allowing Hungarian provisions for the balance sheet and deposit coverage ratios and the exchange funding adequacy ratio (DMM) to remain in effect. Apart from Hungary, an additional 15 Member States have been maintaining their own liquidity regulations until the LCR and the NSFR become effective, which clearly indicates the increased significance of liquidity regulations in the aftermath of the crisis.

iii. Until the end of 2028 the latest, Member States may specify the exposures they wish to exempt from the limits on large exposures, however, such exposures may only be selected from the list provided in the CRR (e.g. exposures to parent undertakings). Such items may also remain exempt after 2028, but the relevant decisions will be adopted by the national supervisory authorities. Since data published by the EBA address each possibility of exempting large exposures separately, the only conclusion that may be drawn from the information is that exemptions are not granted on a consistent basis in Member States. The only

similarity observed is that less significant possibilities for exemptions were applied by a smaller number of Member States.

In CRDIV:

i. The minimum initial capital requirement for credit institutions is generally EUR 5 million, allowing Member States to set a lower level in certain cases, which cannot be lower than EUR 1 million. This point makes it possible for co-operative credit institutions to be established with equity as low as HUF 300 million. Such derogations are allowed in an additional 10 Member States, presumably also primarily in respect of the co-operative sector.

ii. Member States may decide to maintain their requirements for regular reporting by branches of credit institutions registered in other Member States. The Hungarian branches of credit institutions registered in the EU submit regular reports to the MNB, and there are only seven EU Member States where this derogation is not applied.

2.2.2. Options and national discretions

Options and national discretions can be classified into two main groups. The first group includes transitional measures adopted by national supervisory authorities relating to the progressive implementation of the CRR, which may vary by Member State (e.g. the progressive de-recognition of items no longer qualifying as own funds). As such rules are established by Member States' supervisory authorities, in Hungary transitional measures are set out in an MNB Decree[7]. The other main group of options and national discretions includes rules, also established by national supervisory authorities, which are required for the continuous application of the CRR (e.g. the specification of a materiality threshold for the definition of default).

The two groups include the following key national derogations.

2.2.2.1. Transitional rules

The CRDIV/CRR regulatory framework brought such major changes in the regulation of credit institutions that not all institutions could be reasonably expected to ensure immediate compliance with the significantly increased capital requirements and other provisions. Therefore, similarly to the Basel Committee's guideline, EU legislation also offer the possibility of progressive implementation. In several cases, the transitional rules are set out in the CRR itself (e.g. the gradual implementation of liquidity requirements); however, in respect of determining

[7] Decree No. 10/2014 by the Governor of the Magyar Nemzeti Bank (IV. 3.) on own funds requirements, on unrealized gains and losses measured at fair value, on deductions related to unrealised gains and losses and on grandfathering of equity instruments.

own funds, most decisions concerning transitional measures are adopted by national supervisory authorities.

The most important discretional decisions on transitional measures concern the following:

i. *Unrealised gains and losses:* The CRR has adjusted the own funds qualification of unrealised gains and losses relating to institutions' assets and liabilities measured at fair value in the balance sheet. The principle previously applied was that while such unrealised gains would not qualify as own funds, identifiable losses would be deducted. In order to ensure that the value of own funds should better reflect the actual situation, the CRR has allowed unrealised gains relating to institutions' assets and liabilities measured at fair value to qualify as own funds, requiring similar unrealised losses to be deducted at the same time. However, since this amendment would have resulted in significant changes in credit institutions' own funds, national supervisory authorities may grant a transitional period of 4 years for the implementation of the new rules, which means that the new regulations will take full effect from 2018 onwards. In its Decree, the MNB granted the possibility of applying the transitional period in respect of both gains and losses; however, from 2016 onwards, gains and losses will be recognised without regard to the transitional rules. There have been major differences in EU Member States' treatment of gains and losses. A transitional period of the deduction of losses was granted by only 38% of EU Member States (i.e. the majority of Member States required the total amount of unrealised losses to be deducted promptly). Conversely, the progressive qualification of gains as own funds (at 40%, 60%, then 80%), was allowed in 66% of the Member States, whereas in the rest of the Member States unrealised gains qualify as own funds only following expiry of a 3-year transitional period.

ii. *Deductions from own funds:* In CRR, in the calculation of own funds it meant a significant tightening that most of the deductions from own funds (e.g. losses sustained during the year, intangible assets) are no longer deducted from the entire own funds or the Tier 1 capital, rather directly from the common equity Tier 1 capital. Since in the new regulation common equity Tier 1 capital has been assigned special importance, therefore this method of deduction adversely affected those credit institutions for which the share of additional Tier 1 and Tier 2 items is high in the capital. In order for this significant change to manifest not instantly, rather protracted in time, the national supervisory authorities may define a transitional period of 4 years, during which only part of the deductions have to be made from the common equity Tier 1 capital. It is important to note that this temporary rule primarily improves the capital ratios of those credit institutions that possess additional Tier 1 capital, since the deduction has to be made in any case, the transitional rule only enables

the performance of the deduction not from the common equity Tier 1 capital, rather from the Tier 1 capital. In Hungary the MNB permitted the application of this transitional rule, but its actual effect is low, since there are only one or two credit institutions that have significant additional Tier 1 capital providing coverage for the deductions. The Hungarian transitional rules are special in that the MNB did not allow the application of the transitional rule to certain type of deductions (especially repurchased own shares and capital instruments serving the artificial increase of the capital), rather the deduction must be made instantly from the common equity Tier 1 capital. From 2016 even these transitional rules will be terminated in Hungary. In the EU only 35% of the member states applied transitional rules for the deductions to be made from the common equity Tier 1 capital, but this should not be interpreted at all to mean that these countries apply uniform rules, since the Hungarian practice also shows that there may be additional differences among the details.

iii. *Deferred tax assets:* Deferred tax assets that rely on future profitability and arise from temporary differences are also subject to special rules. The Basel and EU rules enabled the deduction of such claims because they can be actually applied only if the institution becomes profitable in the future, and it can take into account these items when calculating its tax liability. Owing to this factor of uncertainty, deferred tax assets must be deducted from the common equity Tier 1 capital. However, in several credit institutions instant deduction would have resulted in a significant loss of capital, therefore CRR enables the gradual introduction of the deduction, in the space of four years. An even longer transitional period, i.e. ten years, is allowed in the case of those deferred tax assets that had already existed prior to 1 January 2014. In Hungary the MNB enabled the application of this transitional period for credit institutions, but since there are relatively few credit institutions that hold significant deferred tax assets, therefore the impact of the transitional action is also limited to a few credit institutions, and from 2016 this transitional benefit will be terminated owing to the amendment of the MNB decree. In the EU 56% of the Member States enabled the application of a transitional period of 4 years and 74% of a period of 10 years, i.e. there have been several member states that have only authorized the gradual implementation of the deduction for deferred tax assets that already existed prior to 1 January 2014.

iv. *Phasing out the capital instruments not compliant with the new rules:* CRR has fundamentally rearranged the requirements for elements of own funds, and they have become not only more detailed, but also much more stringent. The requirements applying to elements of own funds are built on loss absorbance, permanence and the flexibility of payments. Owing to the tightening of the conditions, some of the instruments formerly classified as Tier 1 capital may

only be assigned to additional Tier 1 capital or to Tier 2 capital, in exceptional cases it may also happen that they can no longer be assigned to any capital element. Due to the highlighted role of the common equity Tier 1 capital, therefore the instant implementation of the conditions could have meant in certain credit institutions that they would not be able to comply with the minimum requirements. After 1 January 2014, the entities had to assess to which category the capital instruments issued by them earlier can be assigned under the new regulation. The CRR enables the national supervisory authorities to authorize that the capital elements issued by the institutions prior to 31 December 2011 and acknowledged pursuant to the statutes applicable at that time in the calculation of the own funds, but no longer qualifying as common equity Tier 1 capital, additional Tier 1 capital and Tier 2 capital requirements of CRR, can be phased out from the appropriate category of the own funds gradually, over a transitional period of 8 years. The date of 2011 was necessary because by that time it had become clear for the credit institutions as well that the conditions of acknowledgment as own funds would be tightened. The MNB allowed the application of this transitional rule in its decree (from 2016 this benefit will be terminated) and each of the EU member states has applied it, although as many as five member states have defined a faster pace of phasing out compared to the normal schedule (starting from 80%, the eligible amount is reduced by 10% annually).

2.2.2.2. Options and national discretions necessary for the continoust application of CRDIV/CRR

The options and national discretions mentioned earlier and applying to the transitional provisions will be gradually phased out or their significance will decrease. However, CRDIV/CRR contains several additional options and national discretions that are necessary for continous application. The most important of these items are the following:

i. In the case of exposures secured by real estate property: The receivables that were secured by mortgage registered on residential properties or commercial properties have always been assigned a favourable risk weight in the standard method. Under the rules of CRR, if a loan is secured by a mortgage registered on a residential property, then a weight risk of 35%, if the mortgage is registered on a commercial property, then a risk weight of 50% may be applied. CRR does not provide an exact definition for commercial property, but essentially every real property can be assigned to this category that is not considered a residential property (e.g. plants, arable land, holiday homes). CRR also provides additional detailed conditions for the application of risk weight, for example, the loan-to-value ratio (LTV) should not exceed 80%, or the value of the property should not depend on the creditworthiness of the borrower. However, CRR authorizes

the national supervisory authorities to define a risk weight that is higher than the favourable risk weights but does not exceed 150%, or to impose more strict conditions for the application of the favourable risk weight. These measures could be in order if, according to the position of the supervisory authority, the values of 35% or 50% do not reflect the actual risks appropriately (e.g. real property prize bubbles have developed). In Hungary the MNB law also grants this right to the MNB, however, so far the risk weight has not been raised and more strict conditions have not been set up, either. According to the information published by EBA, there has not yet been any Member State that would have assigned a higher risk weight to receivables secured by residential property, but there are as many as six member states that have formulated additional requirements compared to CRR for the application of the favourable risk weight. The national supervisory authorities have proceeded in a more stringent manner concerning receivables secured by residential property, because there are 4 EU Member States (IE, LV, RO, SE) that prescribe a higher, 100% risk weight instead of 50%. And there are two Member States (BG, GB) where more stringent conditions are required for the application of the favourable weight. There is no overlap between the two country groups, that way there are altogether 6 EU Member States that apply more stringent requirements or risk weight compared to the general CRR rules to exposures secured by commercial properties.

ii. *Definition of a higher LGD value:* CRR requires the national supervisory authorities to collect data about exposure and loss values related to real property lending. Based on these data, and also taking into account the expected future development of the real property market and any other relevant indicator, they have to assess, at least annually, whether the minimum LGD values applying to the exposures secured by residential and commercial properties located in their areas, as defined in CRR[8] are adequate. According to CRR, in the case of exposures secured by residential properties, the minimum LGD value is 10%, in the case of commercial properties it is 15%. If, based on the information, in the opinion of the supervisory authority in the given Member State the minimum LGD value according to CRR is not adequate, they may also prescribe a higher minimum value. The LGD value only has relevance for capital requirement calculation in the case of credit institutions applying an internal rating based approach. If the national supervisory authority defines a higher minimum LGD value, then it is required to notify EBA accordingly, and EBA will also publish these values. CRR does not leave the relevant decision to the national supervisory agency entirely, because according to the proposal of EBA, the EU Commission will issue a regulation applying to those conditions that the

[8] "Loss given default (LGD)": the ratio between the loss occurring owing to the fault by a partner and related to exposure, and the receivable existing at the time of the default.

competent authorities have to consider when defining a higher minimum LGD value. This regulation has not been published yet, it is expected to be released in the second part of 2015. According to the data published by EBA, so far higher minimum LGD values have been defined in two EU member states in the case of exposures secured by residential property (in Denmark, applying to those residential properties that are located in Norway, and in Latvia), and in the case of exposures secured by commercial properties only one such raise has been made (in Latvia, 16.12% instead of 15%).

iii. *Lower large exposure limit to exposures to institutions:* It is the fundamental rule for the assumption of large exposure that the total amount of exposures to one client or group of clients must not exceed 25% of the eligible capital[9] of the bank. This is the general rule, however, owing to the characteristics of the interbank market and in an effort to facilitate transactions of banks among one another, in the case of exposures to institutions in CRR this rule is supplemented by the provision that the limit to the assumption of large exposure is the higher of 25% of the eligible capital or the amount of 150 million euros. In practice, under this rule, if the eligible capital of a bank is less than 600 million euros (approximately 185 billion HUF), then for this bank the exposure to one institution may exceed 25%, although owing to a supplementary rule, this must not be higher in any case than 100% of its eligible capital. The institution itself has to set up the limit.

iv. Assessing the EU Member States, it can be determined that so far only four Member State have introduced limit values lower than 150 million euros. In Hungary no decision has yet been made on this, it will be defined by the MNB in a decree. Since it is also a characteristic feature of domestic credit institutions that they operate with an eligible capital that is significantly lower than 600 million euros, and there are only five banks in Hungary concerning which the eligible capital exceeds HUF 185 billion, therefore it may be worth considering that a threshold value lower than 150 million euros should also be introduced in Hungary as well.

v. *Application of supervisory measures to institutions with similar risk profiles:* CRD and based on it, Hpt. also provides an opportunity for the national supervisory authorities to apply certain aspects of the supervisory review process uniformly in respect of similar institutions. A typical case in this point is the system of risky portfolios defined by the MNB related to the SREP process and published, concerning which the MNB imposes additional capital requirements uniformly, applying to each institution (e.g. balloon/bullet loans, multiple restructuring).

[9] The value of the eligible capital is based on own funds, but its calculation is slightly different.

Based on the data sent to EBA, only a small number of supervisory authorities apply a similar practice, therefore from this aspect the Hungarian SREP is certainly more strict and also more transparent than in other EU member states.

2.3. Other national derogations

National derogation in a broader sense could also be considered to include those legal requirements concerning which there is no uniform EU regulation and the Member States are free to impose obligations.

In Hungary a typical example fro such derogation is the handling of the problems deriving from foreign currency based lending, which was assigned a significantly lower regulatory importance in the rest of the Member States. The EU has no uniform system of rules for reducing foreign currency based retail lending, only a recommendation by the European Systemic Risk Board – ESRB) was published on the subject, in addition, it was quite belated and was not suitable for preventing the emergence of the problem. The Hungarian steps, especially including the tightening of foreign currency based retail lending, then its suspension, the final loan repayment, the implementation of the pool account and the conversion into forint, were all independent initiatives that contributed beneficially to the stability of the domestic financial system through reducing the FX rate exposure of the retail sector.

However, in addition to the many harmful impacts, domestic foreign currency based retail lending also had a beneficial consequence, as in Hungary consumer protection requirements received much more attention than earlier, and on several subjects these requirements are more stringent than the EU standards (e.g. the EU will only require the implementation of common consumer protection rules on mortgage credits from March 2016, while the overwhelming majority of these rules have been in effect in Hungary for several years).

The above example also shows that in the European Union, in addition to the common regulations, there are several areas where the creation of detailed rules implemented at national level is possible and needed.

We can mention several other examples as well where, in addition to the common regulation, there are significant differences in the regulations of the Member States, such as:

i. Company law: in certain countries there are separate supervisory boards and boards of directors, similarly to Hungary, in other countries there is a one-tier system of governance,

ii. *Taxation, duties:* the levy on banks or the financial transaction duty has not been introduced in each EU Member State and their rates are not harmonized either, in addition, there are significant differences in the taxes of bank profits and in the burdens of the employed labour force,

iii. *Accounting:* the EU did not require the application of IFRS as an obligatory accounting tool, it is only obligatory for public companies, but in certain countries the banks are required to apply IFRS, while in others the national accounting standards remain applicable,

iv. *Civil law*: there are differences in the enforcement of a mortgage, this is also important because the risk management of the bank must also be prepared that in the case of a mortgage loan provided in another EU Member State, the method of acceptance as a collateral and the enforceability according to the statutes applicable in the given country has to be assessed carefully,

v. *Scope of institutions under supervision:* the scope of institutions subject to supervision by the supervisory authorities of the Member States has become a point of special importance especially because of the increased significance of the shadow banking sector. For example, financial enterprises are not subject to such a tight supervision in all Member States as in Hungary, but there are differences in the case of other types of institutions as well,

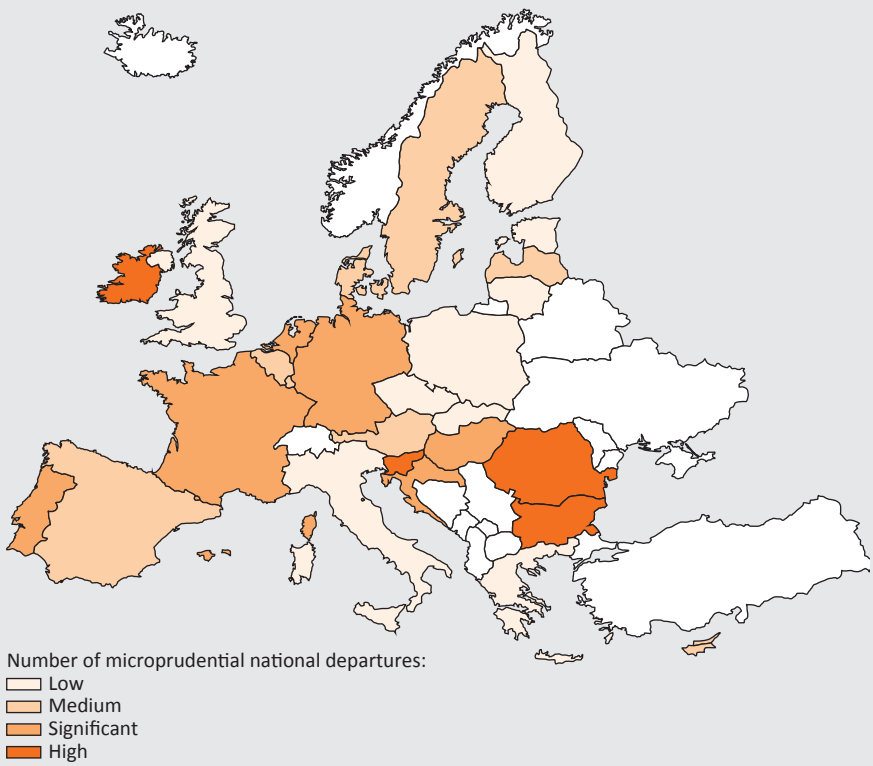
vi. *Separation of banking and investment service activities:* as a result of the global financial crisis efforts have been initiated in several countries for separating these two types of activity. The Commission of the EU also deals with this matter, but no uniform and final statute has yet been developed,

vii. *Credit institution branch of a third country:* the EU legislation allow that a credit institution registered in a non-EU Member State may establish a branch in a Member State, but the consequences of that are not regulated clearly. The EU legislation only requires that such a branch must be no be given a more preferential treatment than a branch from an EU Member State. The practice shows that in the individual Member States different prudential requirements apply to bank branches from third countries,

viii. *Supervisory review process*: the national supervisory authorities have a powerful tool for defining additional capital requirements of the institutions individually. In case of banking groups the ultimate decision on the group level capital requirement lies with the home supervisory authority, but if a host authority can reach an agreement with the home supervisor, it may apply more stringent capital requirement for a subsidiary in a given

country. A special incentive for the host countries to impose higher capital requirements for subsidiaries, that the additional capital means more safety for the institution, but the raise of the capital is performed usually not at local, rather at group level. In order to apply the supervisory review process uniformly, in December 2014 EBA published a guideline, which unifies the processes of the supervisory authorities of EU Member States on several matters (e.g. the templateof the resolution to impose an addititonal capital requirement). Additionally, in the system of the banking union it is ECB, as the single European supervisory authority that ensures the uniform application of the supervisory review process, however, in the case of countries and credit institutions outside of the banking union there is still ample room for national derogations.

Figure 1.
Application of microprudential national departures by country in the EU



Source: The author's own analysis based on EBA (2015a)

3. Macroprudential measures in European comparison

3.1. The scope of macroprudential tools available for EU member states

The basis for the treatment of systemic risks was established by the Basel III recommendation that defined the global prudential standards. After the analysis of the causes and consequences of the crisis, the macroprudential toolset facilitating the treatment of contagious effects occurring at systemic level and that of procyclicality, became part of the Basel recommendations. It is the framework provided by CRDIV/CRR that performs the adaptation of the new Basel requirements to the financial intermediary system of the Union and to the operation of the internal market, furthermore, its adaptation to the legislative system by the necessary amendment and the gradual implementation of the recommendations. The at EU level harmonized tools specifically dedicated to prevent or contain the systemic risks threatening financial stability occured first in that regulatory package. Previously the options for such intervention set by law were limited available at national level.

Within the framework of the uniform European set of rules the following specifically macroprudential tools may be used:

i. Countercyclical capital buffer (*CRD Article 130*): in addition to the rest of the capital requirements, the maintenance of this buffer may be required depending on the state of the credit cycle, to ensure that credit institutions should hold back their lending activity and accumulate sufficient capital in the economic upswing to become more resilient to losses and to reduce the decrease of their lending activity during times of stress. The capital requirement must be primarily fulfilled by the Common Equity Tier 1 capital;

ii. Systemic risk buffer (*CRD Article 133*): an additional capital requirement applicable for the prevention and mitigation of such unregulated, non-cyclical systemic risks that carry the danger of the disturbance of the financial system. The capital requirement must be primarily fulfilled by the Common Equity Tier 1 capital;

iii. Additional capital requirements applying to global and other systemically important institutions (G-SII and O-SII) (*CRD Article 131*): a capital requirement that may be mandated for systemically important financial institutions, its purpose is to provide a counter-incentive to the excessive growth of certain institutions, to mitigate the market distortions arising from the „too big to fail" problem, and by improving their loss-absorbing capacity, to reduce their

probability of default and the negative externalities occurring in the case of insolvency. The capital requirement must be primarily fulfilled by the Common Equity Tier 1 capital;

iv. Earlier implementation of the liquidity requirements (*CRR Article 412*).

If such changes occur in the intensity of systemic risks in the financial system that may have significant negative consequences on the financial system and real economy of the given member state, the following opportunities that may be initiated in a separate procedure (subject to the approval of the commission) are available for the member states (*CRR Article 458*): *(i)* raising the level of own funds requirements, *(ii)* tightening of the requirements for large exposure, *(iii)* increasing the capital conservation buffer, *(iv)* tightening of the liquidity reserves, *(v)* increasing the net stable resource supply requirements, *(vi)* change of the risk weights applying to residential and commercial properties, in order to manage asset price bubbles.

In addition to the above, on the basis of national legislation additional macroprudential tools may also be applied, such as debt brake rules and liquidity rules outside the framework of the CRDIV/CRR regulation.

3.2. The macroprudential regulatory activity of EU member states

Based on the notifications sent by the member states and other countries of the EEA, the ESRB regularly monitors the macroprudential policy actions of EU member states and summarizes them in its database. In our analysis we use the 2015 July version of the database of ESRB, (*European Systemic Risk Board 2015*) (*European Systemic Risk Board 2015*)which contains the data of a total of 25 countries.[10]

Considering the distribution of the legal basis of the macroprudential measures[11] registered by ESRB, the majority of the actions are based on EU legislation. Although certain European states implemented measures prior to the development of the EU-level prudential regulatory framework that were designed to control the risks

[10] We have collected the relevant information about countries not included in the summary issued by ESRB (countries that have not yet sent notification: Austria, Greece, Portugal, Spain, Iceland and as a country outside the EEA, Switzerland) from the web sites of the relevant central banks. The database was supplemented in the case of Hungary as well.

[11] Since the sources of the table are individual notifications, it may contain items that are less relevant for the macroprudential activity of the countries (such as the notification of the quarterly maintenance of the buffer rate, the introduction of reciprocity or other steps of technical nature), therefore it is essential that the data should be cleansed for comparability. After the cleansing of the raw database, we perform the comparative analysis utilizing almost 90 national macroprudential measures of a total of 25 countries. The final sample that we have analyzed contains the tools that are already applied by the individual countries, active or applied but not yet active.

that jeopardize the stability of the entire financial system, macroprudential policy activity has become dynamic since 2014, when the CRR/CRD entered into force.

If we rely on the number of implemented macroprudential actions, it can be seen that the activity of the "old" member states of the European Union is lower compared to the countries that joined after 2004: in total the new member states have implemented 40% more actions than the old ones. The difference can be mainly explained by the different risk levels of the new accession countries and the phases of the financial and real economic cycle that is different by region.

According to the sample available for us, based on almost 70 sets of regulation, the additional capital requirement has been imposed the most frequently in Europe, in that regard, in the category of West-European countries Denmark, the Netherlands and the United Kingdom are outstandingly active, and in the category of new accession countries the Czech Republic and Croatia. All over Europe, the various actions aimed at controlling the excessive credit growth constitute over one-third of the entire sample, and within that the implementation of loan-to-value limits is the most frequent, at present 10 countries apply a tool of this type. Tools aimed at long-term liquidity risks are less common in Europe, while several countries apply short-term liquidity rates.

Table 2 provides an overview of the macroprudential practices of the individual countries. The darker cells indicate the tools already in effect, while the lighter cells show the tools already communicated but not yet in effect. As a primary source we used the ESRB database filtered by the notifications containing actual measures, in addition, in the compilation, in the case of the missing data the web sites of the individual central banks were of assistance. In case of short-term liquidity regulating measures, the EBA's database of national measures was also taken into account. From the perspective of macroprudential policy, totally inactive countries (Greece, Portugal, Spain) were not taken into account in the comparative table. Regarding the capital conservation and the CCB puffers, it should be noted that they will be activated for every country from 2016, so there will not be any great discrepancy in their activity in this regard. The calibration work of these capital buffers has also begun in Hungary.

Table 2
Macroprudential measures in EEA countries

	HU	BG	CZ	PL	RO	SK	CY	EE	HR	LT	LV	MT	SI	AT	BE	DE	DK	FI	FR	IE	IT	LU	NL	SE	UK	CH	IS	NO
Within the CRDIV/CRR																												
Tőke																												
Capital conservation buffer	■	■	■			■		■	■		■							■										■
Systemic risk buffer	■	■	■			■		■	■								■											■
Countercyclical capital buffer			■			■			■		■						■	■						■	■	■		■
Identification of global systematically important institutions and introduction of their additional buffer																■			■		■		■		■			
Identification of other systematically important institutions and introduction of their additional buffer	■																						■					■
Tightening of risk weights					■				■						■					■		■			■			■
Liquidity																												
Tightening of liquidity coverage regulation (LCR)	■																						■	■	■			
Within national competence																												
Debt cap																												
Loan-to-value requirements (LTV)	■		■	■		■	■		■	■							■	■		■			■	■				
Restriction on loan maturity	■			■			■		■																			
Payment to income type debt capes (LTI, PTI, DTI, DSTI)	■					■	■		■											■								
Regulation of loan amortisation																	■						■					
Debt cap rules differenciated by currency	■			■	■																							
Liquidity																												
Regulation of on-balance sheet currency mismatches	■																											
Tools for currency and maturity mismatches (long-term liquidity)	■																										■	
Short-term liquidity requirements	■	■		■	■				■		■	■	■	■		■	■		■	■		■	■		■			
Other long-term liquidity requirements (maturity mismatches)	■																											
Number of measures	**12**	**3**	**3**	**3**	**5**	**4**	**2**	**5**	**5**	**3**	**4**	**1**	**1**	**1**	**1**	**2**	**5**	**3**	**2**	**4**	**2**	**3**	**7**	**5**	**5**	**1**	**1**	**5**

Source: ESRB (2015a)
Note: Greece, Portugal and Spain were not included in the table due to a lack of measures.

3.2.1. Macroprudential tools provided under the CRDIV and the CRR

The use of macroprudential tools on the basis of harmonised EU legislation tends to be more characteristic of old member states. The activity of Scandinavian countries is salient if we look at the macroprudential tools of Western European countries. Risks arising from excessive credit growth and leverage characterised the region, so many measures that aim to mitigate these risks have recently been adopted. Sweden, for instance, is one of the few member states that took the opportunity to define a countercyclical capital buffer even prior to the mandatory deadline set by the European Union, and was the only country within the EU to apply a CCB ratio of over 0%, applicable to Swedish banks from 1 July 2015, representing an additional capital requirement of 1% of their risk-weighted exposure over and above the minimum capital requirement.

Among Benelux states, conducting a less active macroprudential policy by European standards, the Dutch example deserves a mention. For the Netherlands — due to the structure of its banking system —, it is essential to place great emphasis on addressing the structural dimension of systemic risks, therefore it was among the first signatories of the O-SII buffer, the extra capital requirement that may be prescribed for systemically important financial institutions. Banks qualified as important are also required to hold another additional buffer to offset negative incentives due to the decision on the systemic risk capital requirement adopted in 2014. However, as the SRB is not only prescribed for domestic exposure, only the highest of the two capital buffers needs to be applied.

Hungary will apply the tools setting additional capital requirement to be introduced under the European regulatory framework mainly according to the scheduling defined in the CRDIV/CRR. The capital conservation capital buffer, the countercyclical capital buffer will be introduced in 2016, and the necessary calibration work is currently underway. In terms of liquidity coverage requirements (LCR), Hungary is among the first countries which increase the minimum requirement (from 2016 April to 100%), and the systemic risk capital buffer (SRB) will be set in order to treat the risks stemming from problem project loans.

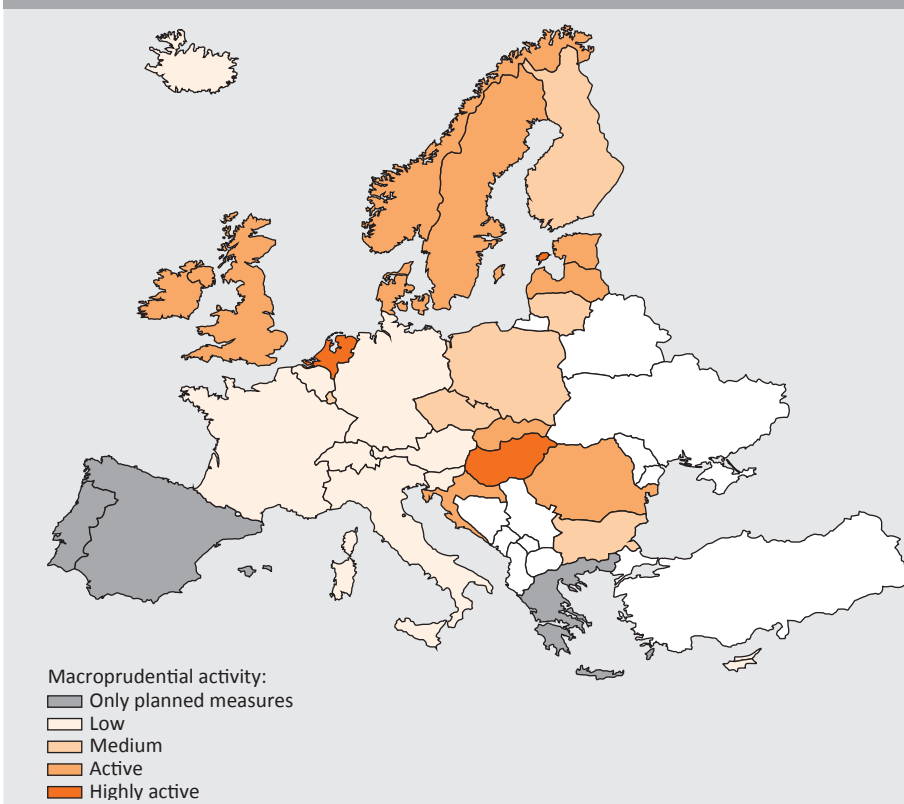
3.2.2. Macroprudential tools based on national legislation

The application of tools within national competence is characteristic of the Central and Eastern European region, where mainly debt brake the rules have been widely adopted. This trend is not new: the most advanced economies had already exhibited lower activity in the use of such tools in the pre-crisis era than developing countries, including those within the region. (*Dumici 2014*) As a result of the crisis, debt brake rules and liquidity standards have also spread outside the Central and Eastern European region, within the Scandinavian region and the Netherlands. In these countries, the main measures adopted include the loan coverage limits,

the regulation of loan amortisation and the application of short-term liquidity standards. The lessons of the financial crisis therefore pushed every country towards a higher level of regulatory activity, but the Eastern region remains more active in terms of tools applied in the context of national competence compared to Western countries.

Hungary has actively applied macroprudential regulatory tools available within its national scope of competence. The introduction of borrowing limits is widespread within the region, but only Hungary limits the repayment instalment amount in respect of income among Visegrad countries (as Poland has revoked the rule). However, Hungarian regulatory practice is most salient in terms of its long-term liquidity standards With the exception of the liquidity coverage ratio, long-term liquidity standards have not yet been finalised within the European legislative environment, and the application within national competence of tools regulating currency mismatch also remain uncharacteristic within the region for the time being. Hungary is therefore exceptional within the region given its liquidity rules

Figure 2.
The macroprudential policy activity of EEA member states



Source: Own analysis based on the ESRB (2015a)

offsetting the provisional absence of the international regulatory environment: ensuring the an adequate degree of long-term foreign currency liquidity using the foreign exchange funding adequacy ratio (FFAR), prescribing a limit on currency mismatch using the foreign exchange coverage ratio (FECR), and managing mismatch risks measured in domestic currency using the mortgage credit funding adequacy ratio (MCFAR) qualify as individual macroprudential measures.

4. The regulatory activity of individual countries relative to developments in risks

So far, relatively few comprehensive studies have compared prudential rules on an international level, due partly to the novel nature of the topic and partly to difficult access to cross-sectional data. The majority of authors use the IMF's GMPI (Global Macroprudential Policy Instruments) database as their point of reference, which contains information furnished by the authorities of respondent countries. In a European context, the EBA and the ESRB database, the latter with a narrower focus, are currently available and represent an adequate starting point. These databases, based on notifications provided by member states, are currently reaching a level of substantive saturation that enables new experiences to be drawn. As the analyses published so far *(*see *ESRB (2015b), EBA (2015b))* only examine the regulatory conduct of EU member states in and of themselves, albeit from various aspects, this chapter introduces a new dimension to rate prudential practice, namely, countries' risk profile. We evaluated bank regulation activity relative to countries' risk profile based on the following:

As a first step, we quantified the intensity of prudential regulation by creating a summary indicator based on the abovespecified tightening of microprudential measures (as these represent the regulatory response to risks) and the number of macroprudential measures. We then created regulatory categories on a scale from 1 to 4 in function of the number of tightening interventions, where 1 represents the strictest and 4 represents the least strict regulatory activity. (See the annex for the classification of countries.) It is important to mention that this only defines regulatory activity on the basis of quantity, and regards the importance of all regulatory tools as being equally important. Based on practical experience, the number of measures broadly provides a good basis for comparison, and assigning weightings according to the importance of specific regulatory tools or other aspects would lend unnecessary complexity to the methodology. It should furthermore be mentioned that the sources forming the basis of our classification only include prudential tools in the narrower sense.

As a second step, we defined the level of risks following the methodology of the ESRB's risk map (*ESRB 2015c*), creating a composite indicator for every country. When selecting individual indicators, we strived to cover the four different macroprudential objectives defined by the ESRB (and the market failures they address), while also incorporating the indicator representing macroeconomic risks. We used the statistics of the European Central Bank (*ECB 2015*) and the International Monetary Fund (*IMF 2015*) as our sources, using the year-end averages for 2012–2014 data for the risk indicators.

We used the following indicators for compiling aggregate risk indicators: *(i)* ratio of non-performing loans within the total loan portfolio, *(ii)* ratio of foreign currency loans within the household and corporate loan portfolio, *(iii)* lending growth rate among non-financial corporations, *(iv)* household debt ratio (as a percentage of gross disposable income), *(v)* the loan-to-deposit ratio, *(vi)* the country's external financial vulnerability.

The individual risks thus obtained were grouped into four categories in an analogue manner by classifying regulatory activity, with 1 being the highest and 4 being the lowest level of risk. The average of these risk indicators was used to determine the composite indicator, which also categorises countries in the abovepsecified manner based on their aggregate risks using a rating of 1 to 4. We attributed greater importance to the adequate management of significant risks, and therefore countries representing at least three significant risks (with a rating of 1) were automatically grouped into aggregate risk category 1. (See the annex for the comparative table specifying the risk profile of countries.)

For our analytical framework, we distinguished four country groups, classifying countries based on two dimensions. In both cases, we regarded countries in category 1 and 2 as having "high" activity, while those in category 3 and 4 as having "moderate" risk or activity. Concerning the grouping it is important to note, that the borderlines between the different groups are not sharp, furthermore the content of them may change dinamically. For example Hungary would be classified as a „Proactive" country today, as the majority of the risks have been treated to date, but for the classification the level of risk for the previous three years were used. Accordingly the assessment should be rather seen as a snapshot.

Table 3.
Regulatory activity and developments in risk levels in EU countries

		Regulatory activity			
		High		Moderate	
Risk levels	High	Hungary Bulgaria Croatia Romania	Denmark Ireland	Greece Italy Portugal	Spain Cyprus Austria
	Moderate	Slovakia Latvia Estonia	Sweden Netherlands United Kingdom	Czech Republic Germany Poland Lithuania Slovenia	Malta France Finland Luxemburg Belgium

Source: Own analysis based on ESRB (2015a), EBA (2015a), ECB (2015) and IMF (2015)

Significant differences emerge in terms of relative activity among the countries examined based on this methodology:

i. "Active" countries: The first group includes countries where the stability of the financial system is threatened by significant risks and regulators exhibit active regulatory conduct to address these risks. This group includes Central and Eastern European countries most burdened by foreign currency lending and actively addressing the resultant risks, as well as Denmark and Ireland. Higher activity on average within the Central and Eastern European region emerged primarily as a result of diverging risk profiles compared to Western countries. The economic optimist prevailing within the region before the crisis, the ample liquidity and the search for yield stemming from the low international interest environment naturally pushed investors towards new EU member states, producing what appeared to be stable economic growth while offering higher yields. The inflowing capital (often in the form of parent bank funding) contributed to economic growth through higher lending, but also gave rise to numerous risks. (*Dumicic 2014*) Excessive flow of credit (which typically affected mortgage loans within the region) and unbridled risk-taking led to the emergence of systemic risks: it pushed up property prices, triggered an asset price bubble and eroded the quality of loans (*Lim et al. 2011*).

The spread of foreign currency lending, uncovered by any foreign currency income in case of most consumers, gave rise to significant risk within the region (*OENB 2010*). These loans further fuelled the otherwise already rapid flow of credit and in case of an exchange rate shock exacerbated the deterioration in portfolio quality. Numerous debt brake regulations have been introduced within the region to manage and prevent the systemic default that has persisted since the crisis and the excessive indebtedness risks.

ii. *"Passive" countries* Members of this group also face systemic risks, but their regulatory activity falls short of the level necessary to adequately manage them. The group is characterised by its inclusion of Mediterranean countries burdened by substantial economic woes: Greece, Italy, Spain and Portugal. Alongside the widely known macroeconomic issues, the system of financial intermediation of these countries is also burdened by numerous risks. All of them faced excessive flow of credit in the corporate segment and household indebtedness also took on excessive proportions. As a result, the share of non-performing loans was far above 10% on average (*ECB 2015*) in these countries, similarly to the Central and Eastern European region. The vulnerability of the system of financial intermediation was further exacerbated by the significant degree of short-term external debt. In spite of these risks, these countries have not yet adopted substantive regulatory risk management measures to shore up financial stability. *Houben–Kakes* (*2013*) emphasise that the introduction of adequate macroprudential tools (e.g. the additional capital requirements to absorb subsequent losses in Italy, Portugal and Spain, and the debt brake rules to prevent a property asset price bubble in Spain) could have contributed both to countering the emergence of risks and minimising subsequent risks within this group.

iii. *"Proactive" countries:* Many of the less risky countries attempt to prevent the subsequent emergence of risks through a preventive and proactive approach: these include Latvia and Estonia among the Baltic states, and Sweden, the Netherlands and the United Kingdom among Western European countries. Although these countries are by no means risk-free, they do not exhibit the persistently high volume of non-performing loans typical of the Central and Eastern European region or the macroeconomic vulnerability of Mediterranean countries.

    The two Baltic states faced significant risks arising from foreign currency lending, but exchange rate risk run by consumers disappeared once they joined the euro area. The most significant risk for this group was the flow of (mainly household) credit. To address these risks, debt brake rules were generally introduced in these countries, duly managing these risks (*ECB 2014*). In addition, mainly short-term liquidity requirements were defined in an effort to prevent liquidity risks.

iv. *"Wait-and-see" countries:* Countries exhibiting lower levels of risks include ones that are focusing less on preventive measures for the time being. Among Central and Eastern European countries, the Czech Republic and Poland fall within this group, as well as Germany and France among key Western European countries.

    Similarly to the previous group, risk is not fully absent, but the level of risks is lower. In case of the Western European countries in this group, excessive indebtedness and the external vulnerability of the financial system are sources of risk, but are currently at a manageable level. The Central and Eastern

European countries within this group also face an issue of excessive foreign currency lending, but developments in household income, the denomination of foreign currency loans and bank interest rate spread practices did not lead to the emergence of risks similar to those plaguing Hungary. Poland, where the CHF loan portfolio affects 500,000 consumers, is a good illustration of this: the income growth of households and the covariance of bank interest rates with the CHF LIBOR interest rate have significantly mitigated the systemic risk arising from foreign currency loan lending (*NBP 2015*). As a result, the conversion act adopted by the Polish parliament only allows the conversion of household foreign currency loans under specific conditions, reserved for those most in need.

Despite the establishment of authorities with a macroprudential mandate, specific risk management measures still remain to be taken in most countries of this group. For national regulatory authorities, this also means that quicker and more pronounced intervention may be needed should potential risks arise in the future than in a scenario where adequate preparation and preventive measures would have been taken.

5. Conclusion

When rethinking the EU's prudential rules, adopting the form of a regulation was conducive to complete unification, however the CRDIV, as a directive, allows leeway for national derogations, and the options and national discretions provide additional freedom for member states. The objective of these national derogations is to provide fine-tuning adapted to national markets and institutional idiosyncrasies within a unified European framework.

The opportunity for regulatory decisions adopted within national competence is provided both on the microprudential and the macroprudential side, and they are often used by member states. However, the opportunity for differentiation provided by the macroprudential toolset is more significant, as a member states or national authorities may define a very large-scale additional requirements for the entire market, currently geared towards tightening (see the spectrum of additional capital requirements applied).

The regulatory practice of individual countries compared to their risk profile exhibits significant differences within the EU, which allows the distinction of clearly differentiated country groups. Severe systemic risks jeopardise financial system stability - mainly in Central and Eastern European countries - and therefore numerous tools have been introduced. By contrast, some member states (such as Greece, Spain, Italy, and Portugal), which also face severe risks, have only intervened slightly into these processes. Relatively lower regulatory intervention also characterises other areas, and a total of ten countries can be identified where

moderate activity is explained by low systemic risk, however these will have to take more pronounced action should future risks arise. Finally, several countries (including the United Kingdom, the Netherlands and Sweden) have adopted a rather preventive approach to prevent the build up of potential future risks.

Hungary is among the most active countries in terms of both micro- and macroprudential regulatory measures. This activity materialises in microprudential regulation in both easing and tightening national differences. Due to its nature, domestic macroprudential regulation characteristically consists of the application of stricter measures. It is important to note however that the high number of requirements imposed within national competence and higher activity within the region are mainly linked to the higher number of systemic risks. Despite the significant mitigation of banking system risks through the conversion of household mortgage loans and many other government and central bank measures, the persisting risks (e.g. the volume of problematic project loans) and the new risks emerging in the wake of forint conversion (the sharp rise in the forint's maturity mismatch and the elevated currency mismatch on the balance sheet) call for an active regulatory approach.

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Annex

Table 1
The degree of key risks and the number of regulatory measures introduced within countries of the EU

	HU	CZ	DE	LV	PL	EE	LT	LU	BG	AT	DK	RO	SK	MT	NL	UK	SE	FR	FI	SI	BE	HR	GR	IT	IE	PT	ES	CY
Regulatory measures																												
Risk profile																												
Share of non-performing loans																												
Share of fx loans to total corporate loans																												
Share of fx loans to total household loans																												
Loans to non-financial corporations																												
Debt ratio of households																												
Loan-to-deposit ratio																												
External financial vulnerability																												

Source: Own analysis based on ESRB (2015a), EBA (2015a), ECB (2015) and IMF (2015)
Note: We examined the lending of non-financial corporations using the lending growth rate among non-financial corporations. The household debt ratio was measured as a percentage of gross disposable income. External financial vulnerability refers to short-term external debt relative to GDP.
Legend:

Colour code	Regulatory activity	Risks
1	Very active	Very risky
2	Moderate activity	Moderately risky
3	Low activity	Less risky
4	Not active	Not risky

Level of interest rates in the light of the changing interest rate policy in Hungary between 1924 and 2015 – How did the central bank base rate get to its historic low levels?

Annamária Madarász – Zsuzsanna Novák

This paper examines Hungary's interest rate policy between 1924 and 2015 with special regard to the role and effects of the central bank base rate. It introduces the changes in the economic environment – with special focus on inflation – characterising the period, and takes account of the main steps relating to the interest rate policy and central bank instruments used since the foundation of the Magyar Nemzeti Bank in 1924, within the framework of the monetary policy of the given period, differentiating three separate eras. The aim of the paper is to point out how central bank interest rates gained greater and greater importance in the anti-inflationary policy of the central bank on the basis of interest rate policy analysis in an adequate conceptual framework and to historically place the 1.35 per cent base rate level currently in effect since the end of the interest rate reduction cycle, which was commenced by the central bank in August 2012.

Journal of Economic Literature (JEL) Classification: E40, E42, E52

Keywords: monetary policy, interest rate policy, historic interest rate

1. Introduction

Since its establishment, the fundamental and primary duty of the central bank has been to achieve and maintain price stability, although there were periods in the past 90 years when the central bank did not treat curbing consumer prices as a primary objective, or tried to stabilise inflation by means other than central bank interest rate policy. Since the foundation of the MNB, Hungarian monetary policy, and interest rate policy in particular, has undergone a number of changes until the establishment of the current practices. In the initial years of the central bank's operation, the interest rate policy of the MNB primarily consisted of discounting trade bills, and thus the role of the key interest rate was fulfilled by the discount and lending rates. After the adjustment of the interest rate increases implemented due to the Great Depression, interest rates remained stable until World War II. In the era of the socialist controlled economy, there was no reference rate which could

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have been referred to as the central bank base rate, nor was there an independent monetary policy. Until the introduction of the two-tier banking system, in the absence of the central bank base rate, Hungary was characterised by a wide range of reference rates. Although the central bank determined lending rates for enterprises on an ad-hoc basis, in addition to those the statutory interest rates fixed by the state also played a significant role. There has been a single central bank base rate since 1987, determined by the MNB, although since the introduction of the two-tier banking system the main policy instrument has changed several times.

In past years, domestic monetary policy has faced a low global inflation environment, decreasing inflation expectations and predominantly downside risks to inflation. Under such conditions, in order to meet the inflation target, the Magyar Nemzeti Bank has pursued an expansive monetary policy since 2012. In March 2015, the central bank restarted the two-year easing cycle commenced in 2012 and then ended this cycle in July. Consequently, the key policy rate – subject to the methodological constraints of comparability – reached a level of 1.35 per cent, the lowest rate recorded in the MNB's 90-year history.[1]

2. Central bank rates and inflation between 1924 and 1947

The Magyar Nemzeti Bank was legally established on 26 April 1924 with the entry into force of Act V of 1924 on its foundation and patent. The *establishment of the independent central bank* was a precondition for the League of Nations loan, disbursed for the post-war reconstruction and economic stabilisation; the MNB was entrusted with the management of this loan, together with the management of the state accounts and the outstanding government debt. As part of the measures aimed at stabilising the economy, the MNB tied the exchange rate of the national legal tender to the British pound, which was based on the gold standard in 1925, and thus the crown – and then from 1926 the pengő – was also based on the gold standard (*MNB 2002*). In addition to the *creation and maintenance of the stability of the national legal tender,* the duties of the central bank included the regulation of the money and credit supply, and in particular the interest charged by commercial banks, using monetary instruments. Within the framework of its credit policy the central bank primarily applied the discounting of trade bills[2] as a monetary policy instrument, and thus the *discount and the lombard lending rates*[3] served as key interest rates (*Botos 1999:41*). In the current terminology,

[1] This paper is based on the working paper of Annamária Madarász and Zsuzsanna Novák entitled "Hungarian base rate at its historic low".

[2] The central bank undertook the discounting of the non-trade bills, i.e. the so-called finance bills only in specific cases, but not only financial institutions were permitted to submit trade bills to the central bank for discounting (but also a certain circle of companies). From 1925 its lending activity was supplemented with the discounting of warehouse receipts and loans secured by lien.

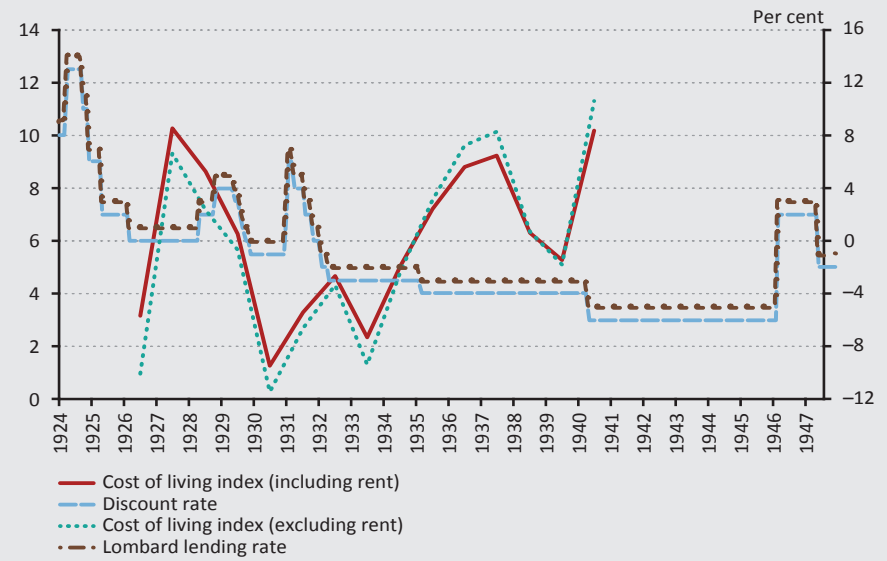
[3] The discount rate was applicable to bills, warehouse warrants and securities with maturities less than 92 days, while lombard lending rates were used for lombard loans secured by government funds, treasury bills and royal state savings certificates.

these interest rates are the equivalents of the interest rate on the central bank's collateralised loans. However, the interest rate policy of the commercial banks was delimited, in addition to the central bank's interest rate decisions, also by the so-called Interbank Agreements, in force since 1919 (which were preceded by a cartel-type agreement in 1908), concluded by highly capitalised banks and savings banks in order to control the business conditions, primarily the deposit rates and in general the benefits provided to customers.

From its establishment until the Great Depression of 1929–1933, starting from interest rate levels of 10–12 per cent[4] the MNB *continuously reduced the interest rate in order to stimulate lending* (*Figure 1*). The first years of economic stabilisation were characterised by enormous demand for money due to public charges increased as a result of the central bank regulation prohibiting the direct financing of the general government and the measures taken in order to balance the budget, and overall due to the financing requirement of the capital investments necessary for the reconstruction of the economy. Thus, in 1924, in view of the unrealistic market level of interest rates that developed in the economy, the central bank increased the discount rate. Within the framework of the interest rate control, which proved effectual only to a limited extent, with this signal the central bank wanted to warn the respective economic agents to reduce the credit applications. Finally, no quantity limit was introduced for lending, and thanks to the international recognition of the crown and the easing of the exchange controls, enterprises also had the opportunity to take foreign short-term loans. As a result of the strengthening of the confidence in the crown, the Magyar Nemzeti Bank increased its gold reserves several fold within one year, permitting a gradual reduction of interest rates. During the interest rate cuts, which commenced in 1925, the central bank took into consideration the fact that for some of the industries the interest rate of the foreign loans exceeded the level under which they could have pursued a profitable business, and thus it gradually reduced its own discount rate below the foreign level of interest rates available for Hungarian towns and counties. In 1926, the interest rate of the League of Nations loan was 7.5 per cent, while the towns and counties could borrow at 7 per cent from abroad, thus the central bank decided to reduce the interest rate level to 6 per cent (*MNB 1925–1947*). The central bank made efforts to ensure that the financial institutions extended the loans they received with the lowest possible spread. Accordingly in 1926 amongst other things, the credit department of the central bank prescribed that financial institutions dealing with it may lend at a maximum interest rate of 14 per cent. In autumn 1928 and in the middle of the Great Depression of 1929–1933, the central bank decided – similarly to most of the European countries – to raise the interest rate temporarily, in view of the soaring bill circulation and the

[4] The Magyar Nemzeti Bank essentially inherited the initial interest rate level from its predecessor institution, i.e. the Royal Hungarian State Bank. In July 1923, as a result of the almost 40 per cent depreciation of the crown and nearly 50 per cent price increase, the Royal Hungarian State Bank temporarily increased the discount rate from 12 per cent to 18 per cent before the economic stabilisation (*Royal Hungarian State Bank 1924*). For the sake of comparison it should be noted that between 1901 and 1918 the Austro-Hungarian Bank applied interest rates of 4-8 per cent (*Popovics 1926*).

Figure 1.
Key interest rates applied by the central bank between 1924 and 1947 (left axis) and the cost of living index between 1926 and 1940* (right axis)
(per cent)



Sources: Botos (1999), Marton (2012a)
**Apart from the indicated horizon no other data were available either with regard to the cost of living indices, or other indices that may capture the changes in the price level for this period*

demand for foreign currency resulting from the general disturbances of the money and capital markets and the flight of foreign capital, which interrupted the gradual decrease in interest rates (*MNB 1925–1947*).

During this period, the *change in the base rate* was primarily motivated by the volume of bill circulation and lombard loans drawn down in the domestic economy, while in view of the interest rate level relative to the foreign sector it was driven by the inflow of the foreign short-term speculative loans and the purpose of influencing gold reserves. Starting from the 1920s, both the discounted bill portfolio and the mortgage bond portfolio of the economy significantly expanded, but they were hampered – particularly the mortgage market – by the Great Depression of 1929–1933, followed by a financial crisis and credit crunch, which led to the temporary restriction of domestic payments and the suspension of stock exchange trading. After the crisis, until the end of World War II, the Hungarian economy was characterised by stable and relatively low interest rates – the lowest central bank interest rate was 3 per cent.

At the time when the central bank was established, the *exchange rate policy was characterised by centralised and controlled foreign currency management;*

however the control was gradually eased, and finally in 1925 the government – at the central bank's initiative – fully authorised the free payment turnover with foreign entities. However, the increasing indebtedness of the country represented a bigger and bigger problem, until the Great Depression posed the risk of state bankruptcy. In order to prevent this, the interest rate increase was accompanied by strict restrictions in the area of foreign currency management. In mid-1931, controlled foreign currency turnover was once again centralised in one hand, i.e. within the MNB's competence, and this regime survived several decades (*Botos 1999*).

The *change in the price level* was essentially determined by the underlying cover of the legal tender, as was usually the case in the gold standard-based monetary systems, and the central bank's interest rate policy only indirectly considered the change in the purchasing power of the domestic currency. The legal tender functioned as a currency covered by gold, for which the coverage ratio was initially determined in 20 per cent (applicable to the total gold reserve[5]), which at the end of 1924 already exceeded 50 per cent and did not fall below 40 per cent even at the end of 1930. Inflation was expressed by the cost of living index, which took the needs of a family of four (wage earners) as a basis and set out from the price change of the representative consumer basket calculated from the costs of food, clothing, heating and lighting, as well as accommodation (*Statistical Review 1925*).[6] This indicator, which is much narrower than the consumer price index, had never exceeded 10 per cent until 1939. The period of post-war hyperinflation, which lasted until 1924, was quickly followed by a six-year period of strong deflation, during which – especially from the start of the Great Depression – the decline in prices became significant.

The fact that the persistent increase in the price level that followed the Great Depression – which reached its peak in the hyperinflation from the start of World War II until the introduction of the forint – was not reflected in the level of the interest rates *suggests the absence of a material link between inflation processes and interest rate policy* (*Figure 1*). However, the increase in the price level, which appeared from 1936 after normalisation of money and credit conditions and was driven by the foreign currency mark-up system[7] and the increase in public charges, further intensified due to the increased emission to cover the costs of the war, resulting in unprecedented hyperinflation. In 1938, the restriction applicable to borrowing by the state, regional municipalities and local governments from the

[5] In addition to the gold coins and bullions, and the foreign commercial coins, a range of foreign currencies was also taken into account in the gold reserve (*Botos 1999*).

[6] The Hungarian Central Statistical Office introduced the new consumer price index from 1951.

[7] Although the currency was not depreciated in the export relations, exporters sold the currency they obtained at a premium to importers, and lenders usually also received the instalments at a premium (*Botos 1999*).

MNB was lifted, including the prohibition of direct financing of the budget deficit. As a result of the uncovered financing of the deficit – through the issue of short-term government securities – prices nearly doubled between 1940 and 1944 – the coverage ratio of the banknote stock gradually fell below 1.5 per cent –, and from 26 August 1939 until the financial stabilisation, i.e. 1 August 1946, they increased by 399,623 quadrillion times[8] (*Marton 2012a; Botos 1997*). In the period of hyperinflation the interest rate was not used for the control of private lending; instead the lending decisions were made by the government bodies and this practice continued in the post-war years as well. In 1946, the central bank nevertheless opted for an interest rate increase, which, in addition to restraining the increasing credit demands, was motivated by the efforts to recover the deposit portfolio withdrawn during the war and divert the banks' fund raising efforts to the collection of deposits (*MNB 1925–1947*). On 1 August 1946, the forint, as a new currency,[9] replaced the pengő, where 400,000 quadrillion pengő was exchanged for a single 1 forint coin (*Botos 1999*). The successful introduction was also assisted by the central bank by limiting the volume of the loans disbursed to the state (*MNB 2002*).

3. Period of the socialist planned economy

Within the framework of the socialist planned economy, the base rate could not be interpreted even in the form of the pre-1948 benchmark rate. Following nationalisation in 1948–1949,[10] with the establishment of the single-tier banking system and the termination of the stock exchange, and of securities trading in general, the interest level of the economy was not decided by the market demand and supply. The MNB, which acted under the supervision of the government through the Finance Minister, had payment, lending and foreign exchange monopoly, thus *it lent directly to the corporate sector and the state* – which at the start of the socialist planned economy essentially meant the same, as the enterprises were owned by the state – and *charged penalty interest if the loan or the interest was not repaid*. The central bank managed both the pre-war debts and the post-war reparations, reorganised the foreign exchange authority's duties, and then from 1950 the execution and authorisation of foreign exchange operations became the exclusive right of the MNB within the framework of controlled foreign exchange management[11] (*MNB 2002*). In the second half of 1948, the interest rate charged

[8] This is equivalent to 10^{24}.

[9] 1 forint represented a gold value of 0.0755 gram (under the Bretton Woods exchange rate of 1 oz gold = USD 35).

[10] Nationalisation of the banking sector and the transfer of the shares of the Magyar Nemzeti Bank and the other "large banks" owned by domestic shareholders to state ownership was prescribed by Act XXX of 1947 (*Meznerics 1972*).

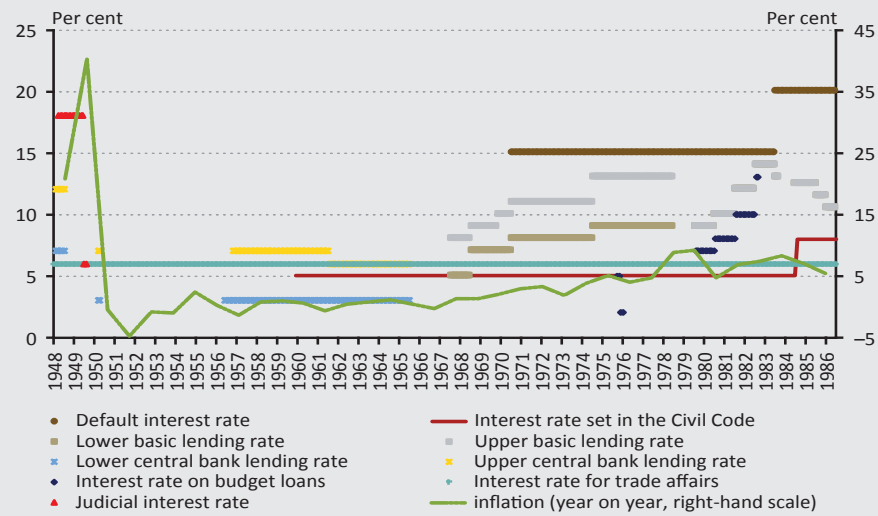
[11] An important statutory background of this was constituted by the so-called Foreign Exchange Code, which regulated – among other things – the mandatory delivery of foreign currency and in the case of foreign trade activity the foreign currency payments were subject to the MNB's licence.

by the central bank was between 7 and 12 per cent per annum, depending on the "situation and status of the borrower" (*Figure 2*). Interest rates lower than this occurred at companies that belonged to the single account system.[12] A resolution passed by the National Economic Council in 1950 outlined the development of a targeted loan system, where the activity of the given company designated the type of the disbursed loan, and the assessment by the bank's experts had less and less significance in the credit decision, while the political considerations of the public administration bodies were enforced to a large extent (*MNB 2002*). Companies managing their business in a planned or unplanned manner were also differentiated, and they received loans at an interest rate of 3 per cent and 7 per cent, respectively. Interest rates lower than that were applied to inventory financing loans after 1956, primarily for the targeted loans disbursed in the case of temporary needs (*Ligeti 1970*). In 1952, based on the Soviet model, the key lending principles were laid down in a decree – planned nature, targeted nature, collateral principle, maturity principle – and the decision on lending rates was a competence of the Ministry of Finance; thus, the central bank had a substantial role only in short-term lending and in particular in volume issues. Initially, the lending policy was determined by the concept that the justification of the loan is provided by the corporate current assets requirements, and it was an important means of state intervention and administrative management. During the years of the transition, this consideration was enforced primarily by the mandatory utilisation of the high-interest forced loans, which sanctioned the corporate liquidity shortage and the unplanned nature of operation. For a long time lending was not regarded as a factor that increases the money supply, but it was rather looked at as the transfer of free savings, assuming that voluntary saving equals financial capital formation. This approach in lending ran into increasing difficulties from the mid-1950s, when due to the decline in economic performance lending conditions were eased, because the companies spent their free funds in advance for capital formation purposes and then turned to the Magyar Nemzeti Bank for loans. Although the central bank had the opportunity to apply penalty interest on the surplus inventories and use higher interest rate on the loans that financed surplus inventories – and from 1962 over-the-norm inventories – in this period the central bank did not raise the base rate of central bank lending,[13] and the efficiency of the interest rate policy was questionable anyway due to the predictability of the interest rate and the dominance of the companies in monopolistic state ownership, which did not face any financing constraint. On the other hand, the expansion of companies' material capital formation over the market demands led to the accumulation of unsold inventories by the 1960s (*Riesz 1972*). As a result of this, the central bank gradually shifted to sales-based lending from production financing (*Ligeti 1970*).

[12] These privileged companies could only have a single current account opened at and managed by the MNB.

[13] Between 1958 and 1965 more than 50 per cent of the loans were disbursed at an interest rate of 3 per cent, which corresponded to the so-called turnover capital loan rate.

Figure 2.
Interest rates applied by the central bank and stipulated in the laws* (left axis) and annual inflation (right axis) between 1948 and 1986**
(per cent)



**The lower and upper bound of the basic loan rate essentially coincided from 1980.*
***Inflation in this period is based on officially fixed prices, therefore it cannot be compared with the present consumer price index.*
Sources: Ligeti (1970), Bank bulletins (1968-1985), HCSO, relevant laws

There was a boom in external trade in the 1960s, and as a result of the economic reforms, the role of the market strengthened in the economic relations, which broadened the central bank's domestic foreign exchange market activity and monetary policy instruments gained importance (*MNB 2002*). *In 1968, with the launch of the New Economic Mechanism, lending also took a new direction*, and macroeconomic balance and profitability – i.e. economic rationality considerations in general – were enforced more strongly in credit assessment (*MNB 2002).* In the new regime, the central bank did not have to play a public authority role in lending, but rather had to enforce the economical utilisation of the funds by economic instruments and contractual terms (*Meznerics 1972*). Companies not only had access to loans at higher interest rates than before, the other costs of borrowing also went up, and the central bank paid more attention to the assessment of creditworthiness and return. The *Credit Policy Directive* of 1969 was regarded as the fundamental document of the credit policy, which was modified annually in accordance with the prevailing economic policy considerations. The Directive stipulated a base rate band – which was 7–9 per cent in 1969, where the bottom of the band designated the interest rate for the working capital loans within 90 days, and the top of it that for over 270 days – compared to which the enterprises could borrow at a discount or premium, while overdue instalment entailed a penalty interest of 6 per cent. In addition, the central bank also permitted the enterprises

to place their surplus liquidity with the central bank as fixed deposit at an interest rate of 3–7 per cent per annum, depending on the maturity. The annual credit policy directive stipulated a base rate, as well as interest rates for working capital and investment loans of different maturities, and deposit rates[14] annually, which raised the importance of the interest rate, as well as of the collection of longer term funds and financing in monetary policy. In 1980, the base rate of short-term loans was 9, in the next year it was 10, and then was 12 per cent from 1982. In 1983, it further increased by 2 percentage points, and then from the following year it was reduced to 13 per cent.

In the socialist economy, statutory interest rates, other than the interest level defined by the central bank, were also in force. The interest rate stipulated in Act IV of 1959 (Civil Code) was an important reference value in the economic contracts – a rate used as transaction interest in civil transactions. The Civil Code entered into force in 1960, and during its several amendments the statutory interest rate was also modified.[15] The contracting parties had the opportunity to depart downward from the transaction interest rate stipulated in the Civil Code, and laws determining rules deviating from these also existed. Amongst others, a Council of Ministers decree was in force before 1 May 1960, which stipulated the highest rate of the interests that could be enforced in court – namely, it set the rate in 18 per cent until the decree's entry into force, and 6 per cent per annum from the effective date. In addition, the Commercial Code of 1875 – which was in force until 1 January 1989 – stated that the statutory and default interest in commercial transactions is 6 per cent of the payable principal per annum.[16]

In the controlled price and wage regime there was no real connection between the development of interest rates and consumer prices; however, during the changeover to a more flexible price system the level of the lending rates stipulated by the central bank gradually adjusted to the increasing rate of devaluation. Prices and wages were fixed by the authorities within the framework of the economic stabilisation of 1946, while the volume of the money issued and the wages were determined depending on the commodity stocks. However, due to the general shortage of commodity and the high budget deficit, prices increased by more than two and a half times by 1951, therefore at the end of 1951 a general price and wage reform was implemented. The retail price system was introduced, in the framework of which the price[17] and tax rate[18] of all products, with a few exceptions, were fixed individually in accordance with social and economic policy

[14] Prior to this the MNB paid interest on deposits only in exceptional cases.

[15] The act was finally repealed by Act CLXXVII of 2013 and replaced by Act V of 2013 (New Civil Code).

[16] The default interest rates related to the transactions of enterprises were regulated by additional Ministry of Finance and Council of Ministers decrees.

[17] With the exception of seasonal price products.

[18] By the 1960s the turnover tax system was significantly simplified.

considerations (*Marton 2012a*). The consumer price index essentially stagnated between 1952 and 1967, as efforts were made to ensure that it did not exceed 3-3.5 per cent (*Marton 2012b*). Thus during this period only rare and negligible "hidden" price and price ratio changes were implemented,[19] and *then inflation appeared again in the economy with the launch of the New Economic Mechanism in 1968.* From the mid-1970s, as a result of the economic policy that increasingly adjusted to market conditions, inflation gradually rose over 5 per cent, which was also attributable to the adjustment of the administrative prices[20] and the growth in the price level of freely priced goods. While the forint was appreciated between 1968 and 1979 following the exchange rate fluctuation of the US dollar, the depreciation of the forint commenced in the 1980s in order to meet the conditions of the IMF loans taken to manage the international debt crisis and foster the balance of the external economy, which also contributed to inflation becoming an ordinary phenomenon. The central bank made efforts to curb the acceleration of inflation by restricting the money supply (*Madár 2008*). Apart from the US dollar, the rouble also played a key role in the setting of the forint exchange rate. A commercial and non-commercial exchange rate existed simultaneously for both currencies, which gradually approximated each other until 1981, followed by the introduction of a uniform exchange rate. The exchange rate, which more and more became a market rate, helped monetary policy place stronger emphasis also on the internal purchasing power of the forint (*Baka et al. 1997*).

4. From the establishment of the two-tier banking system until today

4.1. Start of the two-tier banking system

Following the restrictive monetary policy that characterised the first half of the 1980s, the government announced a demand stimulation programme in 1985–1986, which resulted partly in the strong expansion of the government budget and partly in growth in corporate and retail lending. The credit expansion was based to a lesser extent on domestic funds, and the larger part of it was financed by foreign borrowing and MNB bond issue[21] (*Várhegyi 1988*). Under these circumstances after the changeover to the *two-tier banking system on 1 January 1987,* the MNB's lending activity was once again characterised by monetary tightness. The main macroeconomic challenges were represented by the elimination of the external imbalance of the economy arising from interest payment obligations on government debt, which exceeded the trade surplus, as well as curbing inflation,

[19] The change in quality was not reflected in the consumer price index.

[20] Due to the oil price rise, amongst other things, administrative adjustment of fuel prices also became necessary.

[21] Due to the debt crisis of the 1980s, the MNB tried to manage the external imbalance by foreign borrowing and bond issue, which was not a general practice in the Central and Eastern European countries (*MNB 2002*).

which started to increase as a result of the price and wage liberalisation and the tax reform. In accordance with this, *the MNB regarded fostering an improvement in external balance and reducing inflation as its ultimate targets,* while it specified the regulation of bank liquidity, in addition to the exchange rate, as interim objective (*Szalkai 1989*). The quantity theory of money served as the economic philosophy justification for monetary restriction, which prevailed in the first years of the transition to the market economy. In light of this, efforts were made to push the annual growth rate of money supply below the growth rate of the nominal income. In these efforts, the central bank primarily relied on its direct means; it restricted its refinancing loans and the volume of bill discount on normative basis – by credit quotas allocated in proportion to equity – and also maximised the deposit and loan interest rates by applying interest rate ceilings. The transition between the direct and indirect central bank regulation[22] was represented by the introduction of the minimum reserve requirement system, which initially was based on differentiated rates.

Until the early 1990s, the MNB's main monetary control instrument was the disbursement of one-year refinancing loans. Monetary policy treated the rediscount rate as the base rate, which the central bank raised to 22 per cent by the end of 1990 (*Figure 3*),[23] and adjusted the interest rates of short-term and long-term refinancing loans[24] and deposit rates to this. Initially, monetary policy was dominated by volume control, the main reason for which was said to be the low interest sensitivity of companies,[25] the underdevelopment of the interbank market and generally of the securities market, as well as the pegged exchange rate system and the foreign currency restrictions. *The interest rate increases by the central bank were driven by anti-inflationary efforts, but different opinions were formulated as regards the macroeconomic effect of those*, as due to the almost unlimited credit demand the high interest rates did not curb the appetite to borrow, while they contributed to the increase in the price level due to integration into companies' costs (*Erdős 1989*).

The central bank moved gradually to the market-conform solutions in terms of its interest rate policy and instruments; its market-building role was particularly important in the distribution of the government securities after the development of the two-tier banking system. In this respect, the most important measures

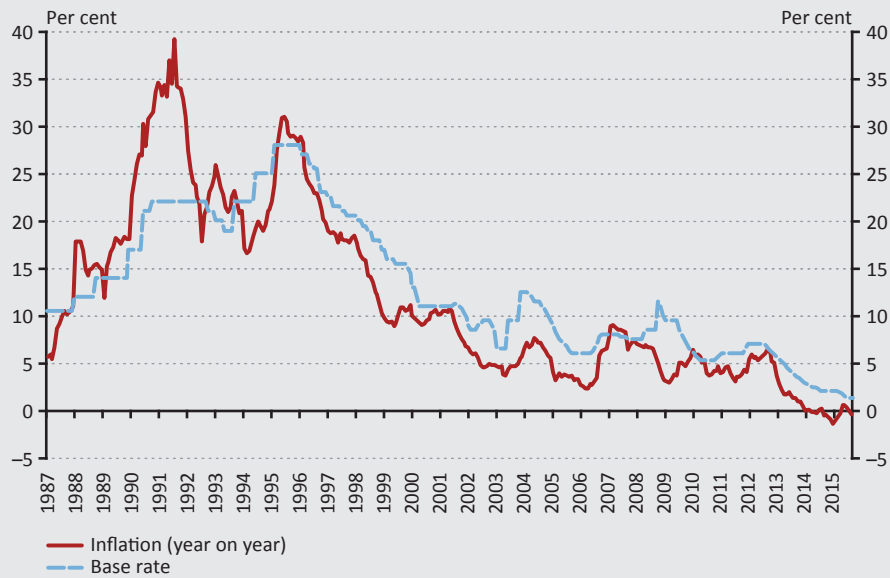
[22] Direct tools: the central bank issues mandatory rules for commercial banks (e.g. credit limits, interest ceilings). Indirect tools: the central bank influences money supply indirectly (e.g. open market operations, foreign exchange swap) (*Tarafás 1995*).

[23] The central bank base rate declared since 15 October 1990 is determined by the MNB.

[24] Directly in the case of the overdraft facilities and the long-term investment loans, and by some fixed multiplier in the case of other loans (*Tarafás 2002*).

[25] The low cost sensitivity of the companies was attributable to the "soft budget constraint" arising from the state ownership, which still persisted.

Figure 3.
Monthly development of the central bank base rate and inflation from 1987 until today



Sources: MNB, Financial Gazette, HCSO

of the central bank included the issue of treasury bills and discount treasury bills,[26] the organisation of secondary market trading and unlimited discounting of treasury bills already in circulation within the framework of open market operations, applied since 1988, with which it helped other players gradually appear in the financing of the government debt, in addition to the central bank. Later on, with the appearance of government bonds issued for the purpose of bank consolidation, the market also expanded in the long end of the maturity spectrum. In 1988–1989, the central bank organised the centralised interbank market, reduced the utilisation of the targeted loans and tied the interest rates of certain preferential credit facilities to the base rate.

From 1992, credit institutions were already permitted to take and place foreign currency in the market, and the limited interbank foreign exchange market also started to operate.[27] Thereafter, short-term foreign exchange swaps became part of the monetary instrument toolbox. *With these measures, the MNB contributed*

[26] At that time, the securities market already started to function partially due to the distribution of the corporate bonds.

[27] It was permitted, to a limited extent, already in 1989 to collect foreign currency deposits, grant foreign currency loans and perform swap operations.

to strengthening the role of interest rate policy, and thereby the base rate, in the monetary control, and gradually abandoned quantitative controls.

In the *pegged, but adjustable exchange rate regime, which was characterised by random and one-off devaluations*, the MNB devalued the forint often and to a considerable degree – on 23 occasions between 1990 and 1995 by 87 per cent in total – the rate of which was defined based on the prevailing inflation difference compared to the foreign countries, in order to avoid the devaluation and appreciation of the currency in real terms. In addition, the MNB made efforts to determine the base rate in accordance with market conditions, that is, the central bank base rate had to generate cover not only for the anticipated exchange rate devaluation, but also for the country risk, which materialised in the interest premium that existed vis-á-vis the interest rate level of the trading partners.

Due to banks' insensitivity to risks and the companies' indifference to costs – and as a result of this also to the interest rates – the level of interest rates became high by the early 1990s. However, after the political transition, the behaviour of both the banks and the companies changed during the development of the market economy, and thus the banks' averseness to risk increased, while the companies became more cost sensitive. The Central Bank Act of 1991 defined the protection of the internal and external value of the domestic currency as its key objective, but the reinstatement of the dual balance, the growth stimulation and the expansion of employment overshadowed the decrease in inflation, *thus monetary policy targeted a general reduction of loan interest rates, as the high interest rates hindered lending due to the changed behaviour of the agents* (*Tarafás 1995*). Accordingly, between 1992 and the summer of 1993 the central bank reduced the base rate by 300 basis points, which was also facilitated, among others, by the balance of payments' surplus. However, the expansive monetary policy generated by the decrease of the interest rates failed, which was reflected by the financial imbalances, the break in the formerly stronger propensity to save and investment recovering to a much lesser degree than expected (*Várhegyi 1995*).

At the end of 1993, monetary policy abandoned its objectives to decrease the interest rate directly and in the period that lasted until 1995 it increased the central bank base rate to 28 per cent due to the unexpectedly high current account and budget deficit, and the unexpected acceleration of inflation (*Tarafás 2002*). Simultaneously, *the set of monetary policy instruments also underwent a significant transformation*. The role of refinancing loans decreased, while the further increase in the already high required reserve ratio would have yielded no result, and thus the question arose as to what kind of indirect instruments the central bank should develop. By abandoning control by refinancing loans, the central bank gradually switched to indirect monetary control, and thus in 1993 the already available government securities enabled it to introduce the repo and

reverse repo transactions with government securities, and thereby provide the banks with an additional liquidity-absorbing instrument in addition to the treasury bills. The *main policy instrument* in 1994 and the first half of 1995 was represented by the *repurchase agreement*[28] which may be interpreted as central bank lending to the commercial banks with securities collateral. The purpose of the instrument was to resolve the financing constraints of banks with poor liquidity (*MNB 2000*). Due to neutralisation of the excess domestic liquidity, from the second half of 1995 the MNB switched over – with regard to the main policy instrument – to the use of the one-month *reverse repo,* as an instrument for sterilisation purposes. On the other hand, in October 1997 the reverse repo transactions had to be suspended, because due to the sterilisation of the excess liquidity the government securities stock available in the central bank decreased considerably, and thus in the case of a high-volume transaction the collateral provided by government securities of the same type could be at risk, which would have complicated the settlement of the transaction in technical terms (*MNB 2000*). Accordingly, the reverse repo was replaced by the *one-month deposit,* and then in the spring of 1999, in order to improve transmission efficiency, the *two-week MNB deposit* became the main policy instrument – through to 2006 – with the central bank base rate later becoming the interest rate thereof.[29] Transmission was supported by the fact that from the mid-1990s the central bank maintained an interest rate corridor around the interest rate of the main policy instrument, that is, it provided overnight loan – or repurchase agreement – at an interest premium within the overnight facility and accepted liquidity from the banks at an interest level lower than the interest rate of the key policy instrument. This interest rate corridor gradually narrowed. *In the second half of the 1990s, the key interest rate set on a downward path, while the current account and the budget deficit both remained at a sustainable level and inflation decreased.*

In parallel with the change in the instruments, *the crawling devaluation exchange rate regime with a narrow intervention band* was introduced in 1995 as part of a large, harmonised stability programme, the key objective of which was to curb the twin deficit. However, stabilisation of the exchange rate still remained an interim goal of the monetary policy framework, in addition to the operative target based on the base rate. Simultaneously with the introduction of the new exchange rate regime, a one-off devaluation of 9 per cent was also implemented, and then during its existence the MNB and the government jointly decided on the monthly rates of devaluation, which was also announced well before the effective date thereof (*Szapár–Jakab 1998*). The crawling peg exchange rate regime restricted the role of

[28] Initially with one-week and then with one-month maturity.

[29] Previously, the base rate was fixed by administrative methods, it was not linked to any central bank instrument, and then from 2001 the interest rate of the key policy instrument and the base rate coincided (*MNB 2002*).

interest rate policy in the sense that – as the devaluation was always announced in advance – economic agents integrated the expected inflationary effects of the exchange rate devaluation in their decisions already upon the announcement, and thus it lowered the chances of curbing inflation (*Tarafás 1995*).

The role of interest rate policy was strengthened by the fact that with the amendment of the Central Bank Act in 1996 the prohibition of monetary financing of budget deficits entered into force in 1997. After that, the central bank was not allowed to grant loans directly to the budget, with the exception of the liquidity loan.[30] From then on, the central bank could participate in the government securities market only as a secondary market actor. The development of yields in accordance with market demand and supply conditions promoted the functioning of monetary policy transmission, which was supported by liberalisation of the foreign exchange market. In 1996, the forint became convertible on maturities over one year, and thus a wider funding base was available through the foreign savings for the financing of the government debt. The financing cost of government debt was in line with market conditions, and for the forint component the base rate represented the main reference yield – as opposed to the earlier financing based on the MNB's foreign borrowing, when the central bank transferred the foreign funds to the budget at a forint interest rate that corresponded to the foreign currency borrowing rate – which improved the effectiveness of the anti-inflationary policy. Simultaneously with this, the MNB also had the opportunity to execute open market operations with the securities purchased in the secondary market – which were already in its portfolio – and with that it supported the meeting of the monetary policy targets (*MNB 2000*).

In the past, the external debt that financed the government's borrowing was stated in the MNB's balance sheet, the gradual repayment of which could be realised through debt swap, that is, instead of the MNB's external debt, the external debt accumulated in part at the general government and in part at the domestic agents. In addition to the debt-type financing, as a result of the increased trust in the forint and the difference between the forint and foreign exchange interest rates, the central bank had to deal with increasing capital inflows, a large part of which was attributable to privatisation incomes (*Neményi 2006*). Between 1995 and 2000, the exchange rate was typically at the strong end of the intervention band, which compelled the central bank to intervene on a continuous basis. The sterilisation of the forint that was put in circulation during the refinancing of the

[30] Until the early 1990s the central bank essentially could provide unlimited financing for the general government through its foreign borrowing, but then with the establishment of the Government Debt Management Agency (GDMA) in 1995 the central bank gradually withdrew from public debt management; GDMA initially took over only the tasks related to domestic debt, and later on the organisation of the domestic and foreign issuance was also transferred to the competence of the institution, which operated under the supervision of the Hungarian State Treasury.

central bank's external debt in forint and the intervention forced the central bank in respect of its main policy instrument to change over to liquidity-absorbing operations and to introduce sterilisation instruments – MNB bonds, amongst other things – announced for different maturities. The sterilisation burdened the central bank with huge costs, but intervention prevented the undesired appreciation of the forint, while the sterilisation of the resulting forint liquidity prevented the development of negative real interest rates, which could have undermined the accumulation of domestic savings (*Tarafás 2002*).

4.2. In the framework of inflation targeting

At the time of the millennium, the disinflationary processes that commenced in the second half of the 1990s appeared to be wearing off, while there was speculative pressure on the strong end of the exchange rate band. Thus, in 2001 the central bank cancelled the crawling peg exchange rate depreciation and defined a wider exchange rate band of ±15 per cent, while full convertibility was implemented in foreign exchange management.[31] In parallel with this, in order to strengthen the disinflationary processes, *the MNB introduced its inflation targeting system (IT)* (*MNB 2006*). Within the IT framework, the primary objective of monetary policy was to achieve and maintain price stability. However, upon introduction of IT, the MNB temporarily had to focus on achieving price stability, and as such it did not specify a constant quantified target, but rather declared the inflation target to be achieved with regard to each year-end. When inflation was reduced to a moderate level, it became possible to define *a medium-term inflation target,* which the MNB has set as 3 per cent since 2007 (*MNB 2006*). As a result of the foregoing, in addition to the inflation projection, as an interim objective, the operational objective role of interest rate policy and the base rate strengthened, but the band-based pegging of the exchange rates still had restrictive power. The central bank defined maintaining three-month and six-month yields close to the base rate as its operational objective.

In January 2003, appreciation speculation commenced against the forint exchange rate, which thus reached the strong end of the band. Hence the MNB decreased the key interest rate in the same month in two steps by 100 basis points on each occasion, and widened the interest rate corridor to protect the exchange rate. These measures fended off the speculative attack, which increased the credibility of the exchange rate regime, and thus in February the width of the interest rate corridor was reinstated (*Barabás 2003*). *However, in the second half of 2003 the central bank faced a different problem, as the process of disinflation faltered* due to the loosening of fiscal discipline, which entailed a deterioration in the assessment of the economy's risk and the depreciation of the forint exchange

[31] In addition, the new Central Bank Act of 2011 ultimately terminated any form of central bank lending to the budget.

rate. In order to protect the exchange rate, and due to the continuation of the disinflationary processes resulting therefrom, the MNB *increased the key interest rate* within a short period in two steps *by 600 basis points in total during 2003*. After this, the forint exchange rate was relatively stable and in mid-2004 a distinct disinflation started, which once again permitted the implementation of an easing cycle. As of January 2007 the two-week MNB deposit was replaced by the *two-week MNB bond as the main policy instrument* (*MNB 2012*). The introduction of the new instrument did not represent a change in monetary policy terms, thus neither the maturity, nor the key interest rate changed. With the change, the main policy instrument was listed as an eligible security, which thus was available for a wider range of institutions than the MNB deposit.

As apart from the tax changes – attributable to the continuous fiscal spending overruns – that impacted the inflation rate, the edges of the exchange rate band also hindered the attainment of the inflation target and did not contribute to the anchoring of the long-term inflation expectations, *in February 2008 the central bank abandoned the intervention band* and introduced the floating exchange rate regime. With this measure, the Hungarian monetary policy framework changed over to the application of the classic IT, and shifted toward the international patterns, where in accordance with the *principle of "one target – one instrument", the central bank uses its main instrument, i.e. the key interest rate, for the attainment of the inflation target.* That is, the key role of the interest rate policy – which is the case also today – developed at that time, as in the framework of that the exchange rate, as an additional target, no longer restricts the monetary policy in meeting the inflation target (*MNB 2008*).

In the second half of the 2000s, Hungary was one of the most vulnerable countries of the region due to the significant budget deficit, the high government debt and the perceptions about risk, and thus the global financial crisis that unfolded in mid-September 2008 brought severe *financial stability risks*. While in this period the developed-country central banks started an unprecedented easing of the monetary stance, in October the MNB decided to *increase the base rate by 300 basis points, citing the need to maintain the functioning of the banking system and to curb speculation against the forint.*

With the pass-through of the global financial crisis, the central bank's task related to the support of the financial stabilisation, as stipulated in the Central Bank Act, gained renewed importance. Hence, as of 2008 the central bank helped the credit institutions ease their forint and foreign currency liquidity tensions, by providing foreign currency liquidity by foreign exchange swaps or announcing collateralised loan tenders tied to the base rate.[32] At the end of 2008, when the operation of

[32] Later on these instruments were also defined as unconventional tools.

the government securities market practically froze up, the MNB appeared in the secondary government securities market with direct purchases to stabilise the situation. In order to ease the liquidity tensions that appeared in the market in autumn 2008, it purchased government securities, and based on the agreement concluded with them the credit institutions increased their government securities portfolio to a degree that exceeded the portfolio purchased from them. The intervention was justified by the freezing of the government securities market, which temporarily deteriorated the liquidity indicators as a result of the rapid economic policy responses, but the central bank was not in the position to take a massive role in the government securities market, aimed at the easing of the burdens of budget financing, as it would have raised the issue of violating the prohibition of monetary financing – see Article 123 of the Treaty on European Union – and the loss of the central bank's credibility finally could have entailed a significant withdrawal of capital (*Krekó et al. 2012*).

After the extraordinary interest rate increase, in view of the improvement in sentiment and the recovery in investor confidence, and following the assessment of the inflation outlooks in November, the *central bank gradually started to reduce the key interest rate*, which reached 5.25 per cent in April 2010.[33] With reference to the increasing inflation outlooks the interest rate cut was followed by three interest rate increases of 25 basis points on each occasion at the end of 2010 and in the beginning of 2011, and then, at the end of 2011, due to the risk of increasing inflation, the global aversion to risk and the increasing perceptions of risk, the MNB increased the base rate to 7 per cent in further two steps.

The MNB *started an easing cycle in 2012.* In summer 2012, as a result of achieving the inflation target, the decreasing vulnerability of the Hungarian economy, the disciplined budget and the decreasing external exposure, the gradually improving perceptions about Hungary's risk and the developed-country central banks' secularly accommodating monetary policy permitted *the launch of the easing cycle,* and the turnaround in fiscal policy further increased the room for monetary policy manoeuvre (*Matolcsy 2015; MNB 2014*). In July 2014, based on the available information, the inflation and real economic outlooks justified the maintenance of the secular low interest environment, thus the central bank closed its two-year easing cycle.

As a result of the changed environment and the strengthening of the risks pointing to low inflation in the long run, in March 2015 the central bank once again reduced the key interest rate and in order to prevent persistent deflation, it restarted the easing cycle, *which was finished in July 2015 – after implementing a total decrease*

[33] Based on the abridged minutes of the Monetary Council's rate-setting meetings. https://www.mnb.hu/en/monetary-policy/the-monetary-council/minutes

of 565 basis points – with the key interest rate reaching its historic low of 1.35 per cent. The easing cycles together may have increased annual average inflation by 1.1 percentage points last year, while this year it may raise inflation by 1.6 percentage point in total (*Felcser et al. 2015*).

Apart from the fact that the price stability objective has been preserved – with interest rate policy still the primary instrument for achieving this –, *the additional mandates of the central bank gained higher importance as a result of the crisis and the management thereof.* In 2013 inflation, which fell below 3 per cent, permitted the central bank to stimulate the macroeconomic performance and treat the improvement of the economy's financing structure – by its interest rate policy and the transformation of its set of monetary instruments – as a priority objective, without jeopardising price stability. In addition to the easing cycles implemented in the inflation targeting framework, in order to restore financial stability and increase the efficiency of transmission, from 2013 the central bank introduced additional unconventional central bank instruments and measures aimed at increasing the central bank transparency. This includes, for example, the forward guidance in the communication, applied actively since the closing of the two-year easing cycle, which facilitates the anchoring of the interest rate expectations and through that achievement of the inflation target. The Funding for Growth Scheme, launched in 2013, and the extensions thereof, may also be regarded as country-specific instruments, which improved the efficiency of the monetary policy transmission through the stimulation of lending to the SME sector (*Ábel et al. 2014*). In 2014, the MNB announced the self-financing programme, through which it contributed to reducing Hungary's external vulnerability, by supporting the financing of the government debt from internal funds. The central bank's interest rate swap transaction introduced for the purpose of self-financing supports banks' risk management, and by mitigating the expectations with regard to the anticipated future path of the short-term interest rates it reduces the long-term yields. The change in the main policy instrument introduced on two occasions during recent years also formed part of the programme. As of August 2014, the MNB bond was once again replaced by the MNB deposit as the main policy instrument, and then in 2015 the central bank extended the maturity of the main policy instrument from two weeks to three months, with the purpose of channelling banks' forint liquidity into government securities. The course of monetary policy was not affected by the change of the main policy instrument in either case.

5. Conclusion

This paper presented the changing role of the central bank interest rates since the establishment of the Magyar Nemzeti Bank up to the present. An interest rate policy similar to the modern version which is aimed at directly influencing inflation was

not characteristic of the monetary policy of the socialist planned economy, which was based on the controlled price and wage system and interest rates fixed by the public authorities, nor of the monetary regulation implemented by the central bank between the two World Wars under capitalist market conditions. Although monetary policy always attached special importance to price stability, the role of the interest rate policy in anti-inflationary policy was restricted by, among others, the inflexibility of the exchange rate policy and the financing of the government budget by emissions. On the other hand, despite the different monetary policy regimes of the various periods, it can be established – also bearing in mind the limits of comparability – that the continuous easing cycle started by the MNB in 2012 and closed two years later was unprecedented in Hungary both in terms of its degree and length. In 2014, continuing this monetary easing cycle, the central bank finally reduced the nominal key interest rate level to 1.35 per cent, marking its historic low. The historically low interest rate level is in harmony with the achievement of the inflation target, stimulates the macroeconomic performance and facilitates the strengthening and maintenance of the financial stability.

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Bank controlling with a marketing attitude – applied statistics in the service of controlling

Péter Kalmár – Zoltán Zéman – János Lukács

In this study, the authors present the analysis of 14 regression models (implemented in business practice as well) which examine willingness to buy and were prepared in the past 5 years at three market-leading retail banks in the United Kingdom, as well as the analysis of the output / explanatory variables of these models. The models aimed primarily at existing customers' willingness related to the buying and repeated buying of instant access, fixed term and ISA-type savings products. The models prepared jointly by the authors and the banks' own analysts fundamentally served a double purpose. The ultimate business objective was to use the models in real sales campaigns with the intention to elaborate, in addition to the selection criteria of the existing direct marketing system, a selection procedure that gives a more precise estimate of willingness to buy. With the help of the more precise estimation, the new procedure proposes the involvement of only those customers in direct marketing whose willingness to buy is higher than in the case of random selection. This boosts cost efficiency, reduces the number of customer complaints and increases customer satisfaction. The scientific goal of the study is to explore the factors that affect the purchase of bank products, the weight of these factors and the direction of influencing, as well as to call attention to a potential development possibility of the methodology of controlling. The methodological processes described in the study can be applied in the preparation of more accurate product sales forecasts, may serve as a basis for campaign cost optimisation processes and may be part of customer value calculation methods as well. The findings can be utilised in other areas of science and business as well. Firstly, they provide information for controlling specialists responsible for the area of marketing that allows more precise planning, and provide timely insight for business analysts into the area of customer behaviour. Secondly, with this study the authors wish to call attention to the necessity of using up-to-date statistical methods and the results of social science in the field of banking and other services sectors.

Journal of Economic Literature (JEL) Classifications: C35, G14, G21, M31

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1. Introduction

The impact of the banking sector on the economy and society is indisputably significant. The changing macroeconomic environment of the past decade and the financial crisis that took place threw light upon the need for banks to be able to quickly react to changes in the external environment. Changes to the banking operations methods applied by West European banks have been seen in recent years. These modifications are implemented according to the bank business policy concept developed depending on the given economic environment and, of course, take place depending on the changes in macroeconomic factors, as a necessity. The reasons include the general deceleration in the demand for banking services, the strengthening competition aiming at private savings, now not only among banks, but, inter alia, among insurance companies as well, and also the growth in banks' operating costs, while there is a decline in transactions that ensure a rapid increase in business volumes and that used to be able to offset this rise in costs.

Following the crisis, the industry started to focus on reregulation, profitability, increasing efficiency and processes that create value for customers and investors. The achievement of these targets requires a logically designed, wide-ranging information system, the implementation and content background of which is provided by a well-designed controlling structure and system. At the same time, in addition to compiling an information basis that is tuned to various decision-making alternatives and contains relevant data, for decision-makers it has become necessary to redesign the planning system in a way to be able to follow the rapid changes in market conditions and thus to ensure the achievement of banks' strategic and operational objectives (*Zéman 2013*). Nevertheless, controlling cannot be considered a 'cure-all' method that is able to automatically guarantee the effectiveness of financial management. It is only conducive to decision-makers' awareness of responsibility and profitability, consequently resulting in consistent, purposeful and systematic decision-making at all levels of banking activity.

In order for financial institutions to be able to meet the new market and regulatory challenges, continuous development and innovation[1] are needed. This may mean the introduction of new products as well as the development of new methods and banking operations methods which increase cost efficiency and allow for more precise planning, in addition to increasing customer satisfaction and loyalty. We believe that the potential development possibility of the current controlling systems lies in the mapping and integration of the applied procedures of the various banking activities. The development of information technology allows

[1] 'An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.' Source: OECD Oslo Manual, 3rd Edition, http://nkfih.gov.hu/szakpolitika-strategia/archivum/oecd-oslo-kezikonyv

the running of complex algorithms on extensive databases, which, in addition to a number of other benefits, facilitates more accurate forecasting, income and cost planning as well as cost management. Take, for example, the scoring models, which examine the risk of customers becoming insolvent. Although the primary objective of these methods is related to the given banking function (to the reduction of bank risks in this example), both the methodology and the results may improve the planning and analysis functions of the management controlling system via more accurate forecasting; in addition, they contribute to banks' more efficient cost management (e.g. with the help of more accurate forecasts of collection charges) (*Oravecz 2007*).

The deviation of bank controlling from the standard controlling methodology is determined by the individual tasks of banks' value creation processes and their products as well as by the banking transactions (payment transactions, lending, capital investment etc.). Accordingly, in view of its nature, bank controlling performs its management tasks for the bank as a whole by integrating two well-defined partial areas, i.e. the controlling tasks of the bank's internal operation and the services (*Zéman 2013*). This integration can only be achieved by connecting the planning, plan–fact deviation analysis and information provision functions of the controlling subsystems functioning with the bank's organisation (cost controlling, profit controlling and financial controlling). Consequently, the stance of bank controlling is twofold: controlling tasks that guarantee the bank's internal operational security and customer controlling tasks between the bank and its clientele.

This study examines a potential connection point of the simultaneous application of the performance-oriented controlling approach and efficient market-oriented marketing. The starting point of the analysis is constituted by the customer relationship management ('propensity') models, which are applied in Western banking practice in an increasingly widespread manner and examine customers' buying potential. Unlike before, instead of all customers or a group of customers selected on the basis of only a simple system of criteria, in the various marketing campaigns these models target only the really potential customers. This is advantageous for both the customer, who receives only the advertisements and publicity materials that are relevant for him, and for the bank, because the use of the models allows the attainment of a higher cost efficiency level. Major enterprises and financial institutions, which have large staff of analysts and data of adequate quantity and quality, set up the models that examine customers' willingness to buy within the framework of their regular risk analysis and customer relationship management (CRM) activities. Although these methods are used by the major credit institutions in Hungary as well, the organisations operating in

Western countries typically apply higher-standard statistical methods in a wider range, in several areas of business activity. The regression models that examine estimated willingness to buy estimate the probability of a certain activity (for example, in the case of a bank, the probability of applying for an account, loan, etc.) to be carried out by those subject to the study on the basis of earlier (often several years old) data. This allows banks to attain a similar level of sales by the targeted involvement of a narrower range of customers, compared to involving all existing customers in the given campaign. As a result, it becomes possible not only to reduce a part of the marketing costs, but also to reduce them to an optimum level from an economic point of view, depending on the sales and customer strategy. In addition to the direct economic benefit, these regression models may provide valuable information for the annual strategic planning. Banks and credit institutions both in Hungary and abroad are starting to realise that identifying and quantifying the factors that influence customers' willingness to buy as well as the utilisation of the results of regression models, for example with the help of linear programming, allows marketing controllers to prepare more accurate sales projections as well as optimised cost planning. From a scientific point of view, the examination of the factors affecting willingness to buy on the basis of an extensive sample and the valuable insight into the current trends of the behaviour of bank customers can be considered significant.

As part of a comprehensive research examining the marketing controlling phenomenon, in this study the authors present the analysis of 14 regression models (implemented in business practice as well) which examine willingness to buy and were prepared at three market-leading retail banks in the United Kingdom, as well as the analysis of the output/explanatory variables of these models. The models were prepared during the past 5 years, using the data of nearly 25 million customers. The models primarily aimed at existing customers' willingness related to the buying and repeated buying of instant access,[2] fixed term[3] and ISA (tax-free, fixed term 'individual savings account')[4] type savings products.

In order to understand the factors that affect customers' willingness to buy, it is important to examine the level and background of the interaction between customers and financial institutions. In the services sector, especially in the case of confidential services, such as financial services, it is essential for all organisations to maintain the standard of customer relations, to handle the services and

[2] Equivalents of instant access type products in Hungary: short-term deposits; savings accounts with higher sight interest rates; and investment accounts (usually current accounts tied to money market mutual fund shares).

[3] Fixed term type products are primarily known in Hungary as long-term bank deposits.

[4] ISA type products can be compared to the long-term investment accounts.

complaints as well as to operate customer-oriented, value-creating processes and marketing. The various organisations establish relations with their customers primarily through their products/services and relationship marketing activity. *Berry (1983)* identifies relationship marketing as a course of actions of crucial importance, whose aim is to *'establish, maintain and develop customer relations'*.

In their comprehensive study, *Neto et al. (2011)* examine the three levels of relationship marketing: *(i) Retention Marketing*': with the help of financial incentives; *(ii)* '*Personalised Services'*: social and financial relations; *(iii)* '*Relationship consolidation with structural links'*: by making the services valuable for the customer.

Based on these is the highest level of relationship marketing, where *'the switching cost is high and senseless'* for the customer. The study also points out that this level may primarily be reached with the help of information technology. The spreading of information technology allows banks to get to know and understand their clients better, which may even lead to the creation of services meeting customers' individual demands. This contributes to customer loyalty, which is essential for *'strong customer relations [...] and repeated product purchase'* (*Dick–Basu 1994*). And strong relations are vital in the present consumer environment (*Alnsour 2013*).

Nowadays, one of the most efficient and most valuable business and relationship marketing 'tool' is customer relationship management (CRM), (*Kaur 2013*). Certain authors consider customer relationship management as a *'key to organisation survival and customer loyalty'* (*Anabila 2013*). In any case, the loyalty-increasing effect of CRM and its impact on profit are indisputable. At the same time, the most optimal result can be achieved if organisations implement the results and procedures of marketing and CRM in the goal-oriented controlling (*Gaál 2007*) practice as well that focuses on cost and income statement, thus creating cost-effective procedures that have scientific bases (for example in the areas of planning and plan–fact analyses).

The literature also contains numerous efforts aimed at the scientific examination of customer profiles and the identification of key factors that affect customers' purchasing decisions concerning a given product, such as Gilberto's conventional mortgage refinancing model from 1989 or the regression model of *Neto et al. (2011)* that estimates the propensity to end accounts. In this study, the authors wish to examine the factors that affect the willingness to buy bank savings products following the methodological rules of the aforementioned models.

In this study, in the course of constructing the models, the primary ultimate business objective was to use the models in real sales campaigns with the intention

to elaborate, in addition to the selection criteria of the existing direct marketing system, a selection procedure that gives a more precise estimate of willingness to buy. With the help of the more precise estimation, the new procedure proposes the involvement of only those customers in direct marketing whose willingness to buy is higher than in the case of random selection.[5] The secondary business objective was the streamlining of existing product sales forecasts and annual financial planning. Credit institutions intended to use the results of the models and the estimation function of the models for the preparation of more accurate sales projections and related cost projections within the framework of annual financial planning. The scientific goal of the study is to explore the factors that affect the purchase of bank products, the weight of these factors and the direction of influencing, as well as to call attention to a potential development possibility of the methodology of controlling. Earlier data series as well as the subsequent evaluation of campaigns were used for the verification of the models.

2. Material and methodology

This study is based on the 14 regression models that examine willingness to buy and were prepared by the authors at three market-leading[6] retail banks in the United Kingdom. The models were prepared during the past 5 years, using the data of nearly 25 million[7] customers. The models aimed primarily at existing customers' willingness related to the buying and repeated buying of instant access, fixed term and ISA ('tax free, fixed-term' Individual Savings Account[8]) type savings products.

Data: For a model, the current holdings of an average 7.5 million customers were used.[9] The variables that constitute the basis for the models were compiled on the basis of the data of the 12 months preceding the campaign period. These variables can be classified into 8 main categories: *(i)* demographic variables (age, gender, marital status, geographical location, etc.), *(ii)* relationship with the credit institution (length of the relationship, number of products, marketing segmentation, etc.), *(iii)* products possessed (products possessed earlier and at present, active product categories, etc.), *(iv)* behaviour (product use, transaction patterns, balance categories, etc.), *(v)* channel use (preferred channels, account-opening, transaction channels, etc.), *(vi)* external customer segmentation (e.g.

[5] As no similar method existed before, all sales within the given decile that are additional compared to the random selection can be considered advantageous from the bank's point of view.

[6] The three banks accounted for nearly 17% of the estimated total household savings market in 2014. (Source: https://www.bba.org.uk/wp-ontent/uploads/2014/06/BBA_Competition_Report_23.06_WEB_2.0.pdf)

[7] By the 25 million customers the authors mean the total clientele of the three banks.

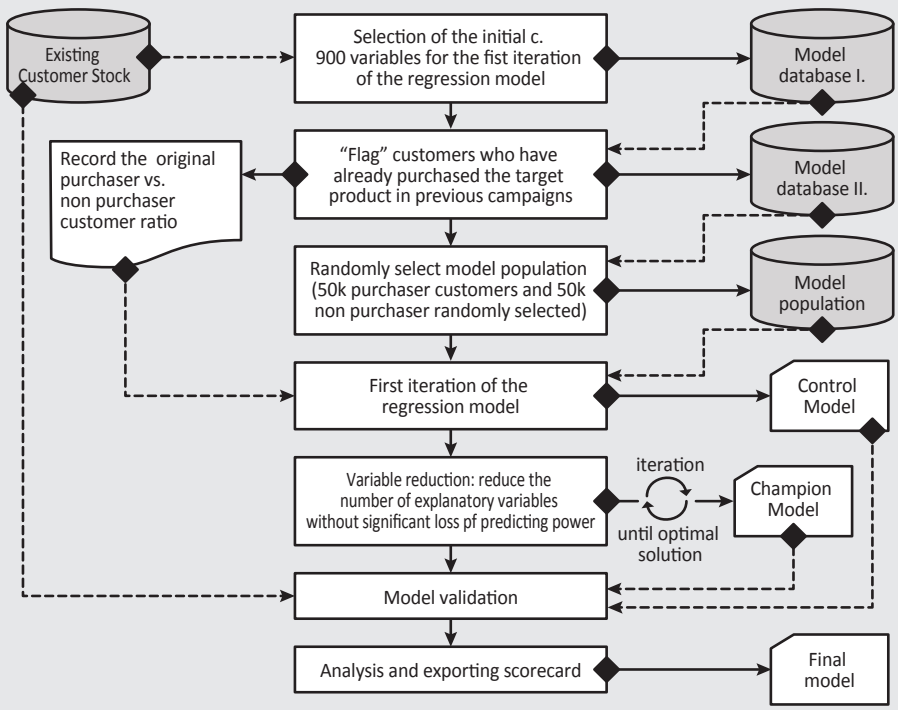
[8] For more information on the ISA – Individual Savings Account – see the site of HM Revenue & Customs. (http://www.hmrc.gov.uk/isa/index.htm)

[9] Examining 5 years, in the case of the 3 products and 14 models it means nearly 25 million different customers.

ACORN[10] or MOSAIC,[11] category system), *(vii)* risk segmentation (standardised information provided by external service provider, etc.), *(viii)* current and future customer value (customer profitability, NPV, buying potential, etc.).

Statistical methodology applied: For the individual models, the methodology of logistic regression was used,[12] as the models basically examine the likelihood of occurrence of a dual outcome event (in this case the purchase of a given product). *Figure 1* details the standardised process of preparing the model designed for the study. As a first step, the nearly 900 variables (which is the average number of variables on the basis of the 14 models) needed for the regression model

Figure 1.
The "start to end" process of predictive propensity model building at the assessed banks



Source: Own composition

[10] For more information on the ACORN type customer segmentation see the official website of the organisation called CACI. (*http://acorn.caci.co.uk/*)

[11] For more information on the MOSAIC type customer segmentation see the official website of the organisation called EXPERIAN. (*http://www.experian.co.uk/business-strategies/mosaic-uk.html*)

[12] As the dependent variable is dichotom, in the course of preparing the model the authors presumed that the explanatory variables have an effect on the likelihood of occurrence of the result.

are formulated with simple data mining methods. There are several possible approaches in this step. For mapping the latent structure among the variables, the authors propose the application of data-reduction multivariate methods (such as main component analysis or factor analysis). These methods help in exploring latent factors that can be formed from groups of variables that are in closer correlation with one another. The new variables created in this way can be used in the model. Another possibility is the involvement in the initial model of all the available variables that are logically relevant in terms of the given subject, which, depending on the number of elements, may require significant calculation and IT capacity. For the interpretability of the results of regression models, it is important to rationalise the number of variables. At the same time, upon forming the variables it is important to take into account that in the case of logistic regression, if we wish to involve in the analysis a categorial explanatory variable that contains more than 2 categories, we have to form different categorial groups from that variable with the help of so-called 'dummy' variables. In many cases (e.g. in the cases of variables that examine the value of transactions, income and asset portfolio) the authors formed several binary variables that examine each category separately, which resulted in a relatively high number of initial variables.

The second phase of model construction begins with forming a randomly selected population. It was primarily necessary in order to reduce the time of processing (the authors used the SAS® Enterprise Miner™ 5.1 version for constructing the models). For most of the models they randomly selected 50,000 customers who had already bought similar products in an earlier campaign and 50,000 customers who had not. Then, taking account of the original distribution and with the involvement of the whole stock of variables, the control model is formed by using a range of CHAID (Chi^2 Automatic Interaction Detector – multivariate recursive classification method) decision trees and logistic (logit) regression models. The following mathematical base model is used during the calculations (*Campbell 2004*):

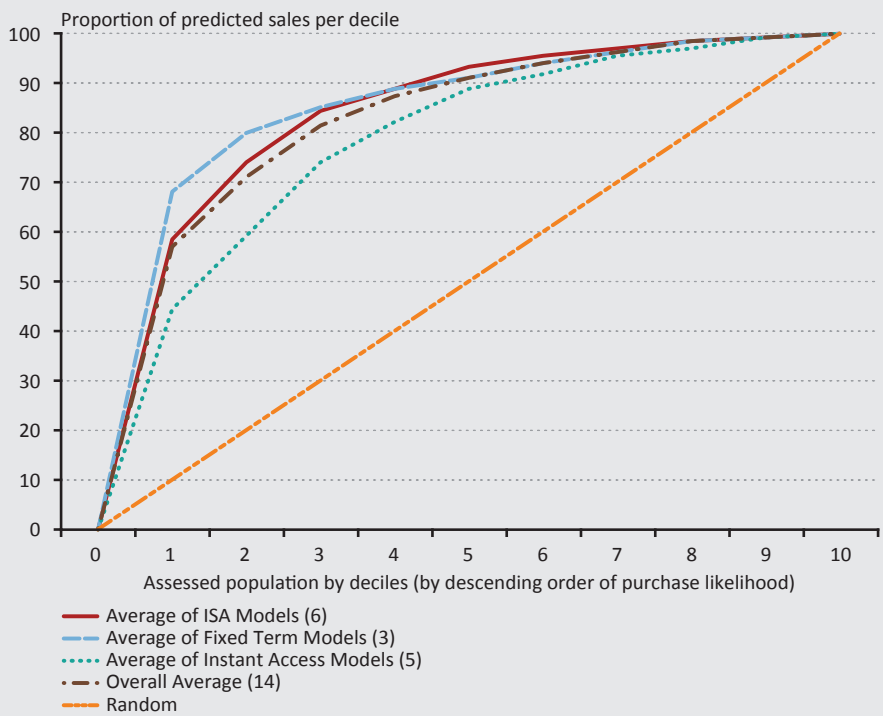
$$\ln\frac{P\left(Y=1\,|\,x_i\right)}{1-P\left(Y=1\,|\,x_i\right)}=\ln\frac{P\left(Y=1\,|\,x_i\right)}{P\left(Y=0\,|\,x_i\right)}=a+\sum_{j=1}^{m}b_j*x_{i,j} \qquad (1)$$

where Y = target variable; a = constant value, taken when Y=0; b_j = the j^{th} the vector of the independent variable; $x_{i,j}$ = the value of the j^{th} attribute of the i^{th} individual; m = number of attributes

The third phase of model construction comprises the reduction (optimisation) of the number of variables and the verification of the estimating power of the models. In the first step, the verification of the created model within software is carried out. For the verification, the control model is taken as a basis, because it is the one that is able to explain the target variable to the greatest extent. During

the various iterations, the number of variables[13] is reduced (using a 'stepwise' method) in a way that cumulative profit should not decline significantly.[14] Although the models are constructed with the help of the statistical software, subsequent tuning by analysts is indispensable so that the result of the produced model can be interpreted along the strategic objective. The model often involves more variables in the analysis than necessary, and thus it may be necessary to combine certain variables or ignore some of them based on analysts' decision, if this does not significantly affect the cumulative likelihood of purchase.[14]

Figure 2.
The predicting power of propensity models (ROC15)
Comparison of logit regressions models (average by product type) with the random selection.



Source: Own composition

[13] A condition of variables' remaining in the model is that the value of the F-proof must not exceed the level of 0.05.

[14] During the analysis, the authors took into account that the primary objective of the models is to increase the efficiency of sales and thus to optimise costs; accordingly, the manageability and interpretability of the final model were also important aspects. The authors set the minimising of explanatory variables as an aim, in addition to determining that, compared to the initial model, the decline in profit attained in the first decile of the final model may not exceed 5%. A further criterion was that the performance of the initial model (AUC – Area under curve) may not be less than 70%.

As a result of the model, the estimated additional sales are stated by deciles, in a cumulative manner. In the analysis, the authors used the ROC[15] curves to depict the differential ability of the models. *Figure 2* shows to what extent (averaging by product type) the individual models are able to estimate the likelihood of the occurrence of a given event compared to random selection. It becomes possible to compare model performances on the basis of the size of the area below the graph (AUC – Area Under Curve).

If the number of variables is optimal (minimal number of variables without a significant[14] decline in profit), the regression equation (model scores/scorecard) is exported and further verified. As a second step, the model data are tested on the basis of earlier campaign data not used for the construction. Typically the data of 6, 12 and 18 months are included, because older data cannot be considered relevant as a result of significant differences in market conditions. If the data of the model are stable, the final verification of the model is conducted with the help of the estimation of the willingness to buy of the current clientele on the basis of the regression equation, using statistical software (the authors used the SAS® Enterprise Guide™ 4.1 version). If there is no significant[16] deviation between the distribution measured at the beginning of the model from the new, dotted distribution originating from the current stock, it is possible to use the model for business purposes. The models prepared can be used in new campaigns, although it is always necessary to check how the explanatory power of the models changes, and a new model has to be constructed if necessary.

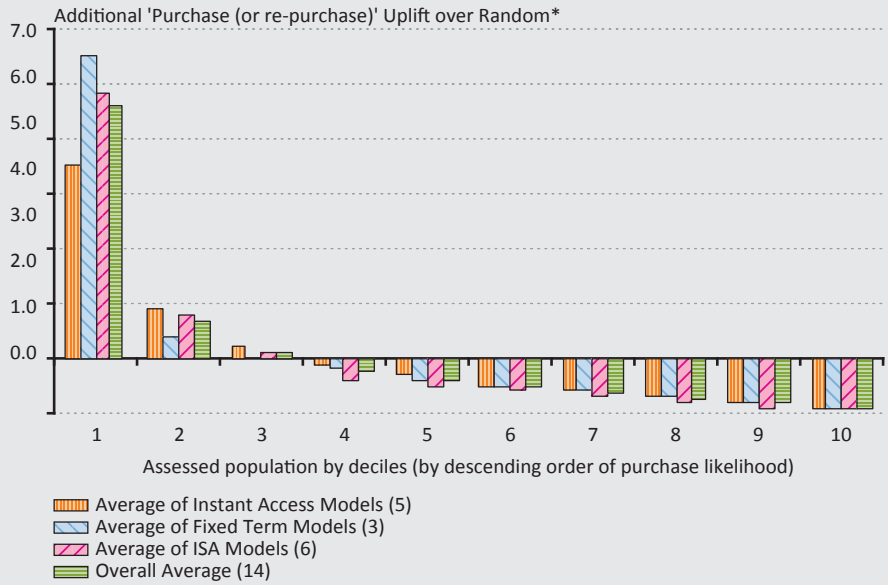
3. Results

In the current banking practice, campaign budgets are prepared at the beginning of the year on the basis of previous years' experience and data, the strategic objectives and inflation. In the case of the banks under review, the practice was that in each campaign they targeted only 30–40% of a given product's clientele with direct marketing tools (e.g. letter, e-mail, phone call, etc.). The models helped this selection process by ranking the customers on the basis of their willingness to buy related to the given product compared to the random selection. As a result, banks can inform that 30–40% where the probability of purchase is the highest, thus attaining a higher level of cost efficiency. *Figure 3* shows that in terms of the primary ultimate business objective, 11 of the 14 models prepared by the authors

[15] Receiver Operating Characteristic

[16] In the case of the models used for the study, the distribution of the population under review and of the original population have to reach an at least 0.7 correlation level in any case, depending on the likelihood of purchase and the explanatory factors. In the event that the correlation of distributions had not reached the given level as a function of a factor, further examination of the given explanatory variable was necessary.

Figure 3.
Cumulative Gains from the 14 assessed models
(average by product type)



**Az ábra azt mutatja meg, hogy a becslő modell használata esetén mekkora várható többletértékesítés érhető el az adott decilisbes amennyiben a véletlenszerű kiválasztás által elérhető értékesítést egységnyinek vesszük.*
Source: Own composition

resulted in significant[17] additional sales in the first three deciles, while the other 3 models in the first four deciles.

On the basis of the models prepared, instead of a pre-determined appropriation, for banks it is worthwhile to involve new customers in the case of each additional spending until they are able to involve a customer whose likelihood of purchase at least corresponds to the likelihood upon random selection (assuming that the selection of customers is carried out in a declining order of likelihood of purchase).

In addition to the primary business objective, based on the variables included in the model it becomes possible to formulate the profile of the potential customer regarding the various products. This is especially important during product planning and the planning of annual product sales. *Figure 4* presents the variables of the 14 models summed up by product types and their average impact on the models.

[17] All additional sales potential identified compared to the random selection has to be recorded as positive result in the given decile. In the case of the credit institutions under review, product managers classified all additional likelihood of sales as significant that resulted, compared to random selection, in an at least double likelihood of purchase in the case of 30% or 40% of all customers.

Based on their occurrence in the various models, the variables can be divided into two groups: *(i)* common factors that are present as explanatory variables in at least two types of products; *(ii)* savings product specific factors that belong only to one given product model.

Table 1.
Key factors of product purchase / re-purchase propensity
(average by product type)

	Weight and direction of impact in			
	Instant Access Models	Fixed Term Models	ISA Models	
Lifestage category / External consumer segment	40%	28%	23%	Common Variables
Customer Age	8%	15%	41%	
Number of other savings products	5%	4%	7%	
Average Savings Balance (3months)	2%	24%		
Average Current Account balance (3months)		5%	4%	
Online Banking Usage	22%		18%	
Customer tenure	3%			Savings Product Type specific variables
Current Account Direct Debit volume			3%	
Credit product held	(–)14%			
Average BACS Transaction value	4%			
Number of Dependants		(–)2%		
Risk Grade		4%		
Marital Status		12%		
Current Account credit interest earned		3%		

** Variables with less than 2% explanatory power have not been added to the table above.*
Source: Own composition

Common factors: The factor with the greatest explanatory power is the Stage of life / External customer segmentation. This variable is the result of the regular questionnaire survey of an independent market research firm (CACI, Ebenchmarkers) and of the national census. The data show the various segments of the whole population of the United Kingdom broken down by postal districts, based on an in-depth analysis of demographic, geographical and lifestyle characteristics as well as consumption habits. The real strength of the variable is given by the depth of the insight into consumer segments, which information is not available for banks in any other way.[18]

[18] For example, the population is divided into five main categories from 'wealthy achievers' to 'hard pressed'. These variables were created from the data originating from the census and as a result of questionnaire surveys analysing lifestyle and consumption habits, also strengthening the estimation ability of models.

The second strongest explanatory factor in the models that examine willingness to buy savings products and willingness to buy them again is the age of the customer. This variable accounts for nearly 41% of the explained portion of the ISA ('tax free, fixed-term' Individual Savings Account) models. The age variable is essential in savings models because it represents the amount of time available for the customer to obtain sufficient funds for living and saving. The preliminary analysis of the models shows that the amount of average savings per customer has a strong correlation with the age of the customer. This is especially perceptible in the case of the ISA models. The essence of the ISA products is that the customer can place new savings on a tax free account up to an annual limit determined by the state. Cumulative savings of previous years can be taken on to this new tax free account upon maturity (for this, it is necessary to buy a new ISA product that is in line with the current conditions and interest rates), or the customer may decide not to buy a new ISA product, but in this case he receives only an annual 0.5% interest premium. Consequently, the more money the customer saved during the years in a cumulative manner, the more interested he is in continuing to keep the tax free savings on a new tax free account that offers the highest yield under the current circumstances and in adding new savings to the account up to the annual limit. Another predisposing factor is the number of other active savings possessed. Although this variable is less relevant, it is able to describe the earlier relationship of the customer with the bank and the extent of market presence.

The savings and current account balance of the three months preceding the purchase of the product is also one of the factors. These variables are good indicators of the existence of the amount intended to be placed on the savings account and of the evolving conscious willingness to save. The last common factor (on the basis of this study) is the use of the Internetbank. This factor has influencing power in the case of the instant access and ISA models, but is not present in the case of fixed term products. The underlying reason is the age profile. While mainly people over the age of 55 (69% of all those who have fixed term products) look for fixed term products, in the case of instant access products the customers most probably (38%) fall in the age group of 25–44 and in the case of ISA products in the age group of 35–64 (83%). Internet use also correlates with the age of customers, but in an inverse proportion.

Savings product-specific factors: instant access product models: in these models, customer relationship lifespan and average current account transactions as explanatory factors play a significant role. Nevertheless, of the product-specific factors, loan product possession had the most significant impact. Particularly strong correlation is shown by the presence and magnitude of the overdraft facility and the size of credit card debt. The negative impact on the model clearly shows that the magnitude of the loan is inversely proportional to the customer's

willingness to save (perhaps in this case it is more appropriate to use the term 'ability to save'). This factor is significant in instant access models because the target age group of this product and of the loan products is basically the same.

Fixed term product models: fixed term products are basically related to a given stage of life, thus the factors with the greatest impact are the ones that characterise the profile of the stage of life, such as the number of dependants, marital status, risk rating, etc. The models reveal that these products will most probably be purchased by older couples who do not live in the same household with their children any longer, the customer does not have active loans and belongs to a good debtor risk category. Due to the basically low current reference interest rates, the choice of bank interest rates is relatively narrow for customers. The interest rate dispersion of demand deposit products offered at present in the UK market is low. Accordingly, it is clearly visible from the models as well that price sensitivity (interest rate sensitivity) is not strongly represented in the models. The only product type is the fixed term product where this size of interest rate appears among the explanatory variables. Depending on the maturity, the dispersion of reference interest rates is greater here, which clearly indicates stronger competition. The interest rate sensitivity that appears in the fixed term model corroborates that the customers who look for this product are also aware of the aforementioned competitive situation and their bargaining position.

ISA product models: for these models (based on the average of the analysed 6 models), 93% of the explained proportion can be explained with the common factors that influence the willingness to buy savings products. Another variable, albeit with a low explanatory power, is the number of direct debit orders. The number of direct debit orders is basically a transaction behaviour profile related to a stage of life, showing similarities with customers that buy ISA products in terms of age and customer segment. The following figure summarises the various factors as well as their impact on the models and their direction.

4. Conclusions and proposals

In our opinion, the analytical processes created during the preparation of the model and their results can be utilised at several levels: *(i)* In a direct manner, as parts of sales campaigns, they can be cost-effective and efficient tools for compiling the target group of customers. *(ii)* At the same time, in addition to the marketing function, in their present form the models are able to prepare more accurate product sales forecasts as well. This may improve the efficiency of the planning function of controlling to a great extent. In our opinion, the degree of efficiency of forecasting can be increased with the inclusion of further, mainly non-bank factors/

variables.[19] *(iii)* The models prepared and mathematical and statistical methods in general allow the determination of the optimum level of certain cost categories. For example, instead of the aforementioned simple campaign cost planning process, it becomes possible to determine the optimum number of customers who can be involved in the campaign, which ensures the maximum expected profit for the bank at a given unit cost.[20] *(iv)* In an indirect manner, the models may also serve strategic planning functions. Firstly, the results help decision-makers to better understand the target segment of a product. Secondly, an indispensable condition of determining customer value, which is used increasingly frequently in the banking industry, is the presence of future-oriented indicators that examine willingness to buy, i.e. the potential future value.

In our opinion, the results and the methodological approach can be utilised not only in the banking industry but also in other areas of science and business. Firstly, for controlling specialists responsible for the area of marketing they provide information that allows more accurate planning (*for example they can be parts of the indicators that can be built around the aforementioned variables, reports or the annual sales planning model*), and provide up-to-date insight for business analysts into the area of customer behaviour. Secondly, with this study the authors wish to call attention to the necessity of using up-to-date statistical methods and the results of social science in fields of banking and other services sectors.

The authors propose further analysis of the subject. Firstly, the research can be extended to the data on other countries (e.g. Hungary), and secondly, to other product types (loan products, current account products, insurance products). A possible direction of research is the examination of cultural and social differences as well as of the differences between the customer profiles of the pre-crisis and post-crisis periods.

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[19] For example, the given credit institution's market share in the given range of products, customer satisfaction, the dispersion of the product range that is in the market, the relative size of branch use, etc.

[20] The number of customers where the unit cost of additional direct marketing coincides with the marginal additional income that can be expected from the additional direct marketing.

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Timing characteristics of overnight unsecured interbank transactions in VIBER

László Bodnár – Miklós Luspay – Cecília Pintér

The article examines the timing, duration and underlying factors affecting the properties of overnight loans settled in the Hungarian large-value payment system (VIBER[1]) operated by the MNB (Magyar Nemzeti Bank), from a payments perspective. The authors primarily focus on questions such as what sort of patterns or trends exist in regard to the settlement times of unsecured overnight loans completed in VIBER, what factors affect these times and what does the maturity of an O/N transaction depend on, in general. The paper finds that in the case of money market shocks, system participants tend to react similarly in relation to the timing of their O/N transactions. The maturity of overnight transactions is more affected by the timing of O/N loan repayments rather than the borrowing times.

Journal of Economic Literature (JEL) Classification: E42, E44, G21.

Keywords: payment system, VIBER (RTGS), ICS, payments, liquidity, liquidity management, overnight unsecured interbank market, timing of transactions, maturity

1. Introduction

This study examines the settlement practices of money and capital market transactions performed in VIBER, specifically focusing on the timing patterns of lending and repayment of overnight (O/N) unsecured money market loans. This paper is the first part of a series that will go on to analyse other interbank transactions completed in the payment systems.

In our analysis, we linked Hungarian O/N unsecured interbank transactions with the VIBER database and then examined the timing of transactions' settlement, the underlying reasons for diverging timing behaviours, and also the adjustment of the banking sector as a whole to the events that occurred during the period under review.

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[1] Domestic, large-value time critical payments, including interbank money market transactions are settled in VIBER (Hungarian acronym for the real-time gross settlement system) operated by the MNB.

For a stable banking system, smoothly functioning money and capital markets are required in which the optimisation of sector-level liquidity takes place. For the money market as a whole, we can distinguish two submarkets. In the case of the *secured* money market, banks are obliged to pledge adequate collateral to ensure guaranteed completion of the transaction, i.e. counterparty risk is hedged. This includes the *repo market*, where the underlying collateral is a security, and the *FX swap market*, where currency swaps take place, i.e. *"the receivable arising in one currency serves as collateral for the liability outstanding in the other currency"* (*Páles et al. 2010*). The other segment of the money market is called the *unsecured* (depo) market, where no collateral is required to complete a transaction, and therefore no guarantees are included at all if the other credit institution in the same transaction defaults. In this case, the counterparty limits set by the individual business partners against one another restrict lending and borrowing. Transactions can be concluded for various maturities, but longer maturities are less relevant in terms of payment transactions, so this paper primarily focuses on overnight unsecured transactions. Market players with temporary liquidity shortages or surpluses may – alongside other market and central bank options – lend to one another with overnight maturity, which implies a repayment obligation on the following business day. These short-maturity transactions constitute a key tool of bank liquidity management. Credit institutions also have the option of concluding their transactions with the central bank (by placing deposits at the central bank in the event of a liquidity surplus, or by borrowing from it in the event of a liquidity shortage), but in an optimal scenario, banking system participants complete such transactions among each other rather than with the central bank, a behaviour which is also stimulated by the central bank's pricing (width of the interest rate corridor). The objective is for credit institutions to place their excess liquidity on the interbank market and to meet their liquidity needs from this same interbank market. Depending on what is written in the contract by the parties, O/N unsecured interbank transactions can be regarded as both lending and the placement of a deposit, they are henceforth referred to as O/N interbank lending and repayment.

An O/N unsecured interbank transaction is concluded directly between two counterparties on the transaction date (hereinafter day T) under market terms, and its fulfilment involves a movement of cash (movement of principal), that is, a payment between the participants in the transaction. On day T, the lender of the O/N loan (Bank A) transfers the principal amount to the borrower (Bank B). On the following business day (hereinafter *day T+1*), the borrower of the loan repays the principal amount and the interest payable based on the interest rate defined for the transaction to Bank A.

The cash movement linked to O/N transactions can be carried out in two different manners, depending on where the two participants keep their payment accounts. If the lender does not have a payment account for the borrowing bank, then two

direct VIBER participants transact with each other, meaning that the settlement of the O/N loan takes place in the large-value payment system VIBER. However, the O/N unsecured interbank transaction is not necessarily carried out as a VIBER transaction if one of the credit institutions holds a payment account for the other. In this case, the transaction may be settled through this account, without using the payment system (these are referred to as *"on-us"* transactions[2]*).* If a credit institution holds a payment account for the other party, but obtains the required funds for the O/N loan from the money market, then a VIBER transaction is associated, although not directly, since this latter settled in the payment system is separate from the on-us O/N transaction. Last but not least, we must also mention the case where both the creditor and borrower hold their accounts at the same third party credit institution. In this latter case, the transaction is settled by means of a simple book transfer between these two accounts, hence not generating any turnover in the RTGS.

In this analysis, we observed the timing of interbank O/N transactions based on data available in the RTGS. We analysed how the different properties of the participating institutions affected the timing of O/N transactions, and also how the various changes taking place on the money market in the period under review (such as central bank liquidity measures, money market uncertainty) affected this. The majority of studies focusing on the O/N money market concentrate primarily on the general features of O/N interbank markets, but tend to focus less on the settlement practices of transactions, timing patterns and changes therein (especially during times of money market shocks). This paper attempts to identify the features of the unsecured O/N market from the perspective of payments, in particular timing patterns and how these features have changed on the whole since 2008. Developments in the timing of transactions may allow us to draw certain conclusions on trends and behavioural patterns. When writing this study, aside from analysing data, we also talked to treasury and back office experts to identify behavioural patterns.

This paper is divided into five chapters. After the introduction in Chapter 1, Chapter 2 presents the analysis environment, in particular the period under review, as well as the role of the domestic RTGS. Chapter 3 highlights the methodology applied in the analysis. In this section we also elaborate the success rates of linking the two databases, detailing the result ratios (how many transactions we could successfully identify in both databases) and the possible reasons for failed identifications. Chapter 4 details our findings and addresses the unique characteristics of the borrowing and repayment legs (first and second leg) of O/N transactions, as well as developments in the timing of both of these legs during the period under review. We explore the role of various sized transactions in liquidity management and

[2] see Subchapter 3.2 for more.

identify the possible reasons driving the movements in the quarterly and year-end timing of O/N items. Finally, we summarise the length of O/N transactions. Chapter 5 provides a summary of our experiences and sums up our conclusions.

2. Analysis environment

2.1. Horizon

This study examines O/N unsecured forint interbank transactions settled between 2 January 2008 and 31 July 2014 among all of the interbank money and capital market transactions. On the basis of VIBER value dates, we observed the settlement time stamps (not the time when the contract itself was concluded) of both legs of unsecured O/N loans. Timing behaviour is significantly influenced by the characteristics of the interbank market, and thus we have broken down the entire period into phases based on the key economic events that shaped the market. The five periods reviewed are:

(1) Pre-Lehman period: 2 January 2008 – 20 October 2008. A "period of calm" for the O/N unsecured interbank market. O/N transactions were carried out smoothly, without considerable adjustments and with similar volumes as in earlier periods. No significant change characterised timing behaviour.

(2) The Lehman shock – the period when the US subprime mortgage market crisis filtered through to Hungary: 21 October 2008 – 16 December 2008. The impact of Lehman's collapse in September filtered through to Hungary in October 2008, causing substantial changes on the O/N unsecured interbank market in terms of value, volume and also timing patterns. In general, mistrust among market participants occurred, counterparty limits set against each other decreased, drying up the money markets. Credit institutions channelled their excess forint liquidity into MNB deposit instruments (primarily overnight deposits), considered to be the safest at that time.

(3) Post-Lehman period: 17 December 2008 – 31 December 2009. Credit institutions adapted to the changed circumstances on the interbank market. This was an initial period of market consolidation which is clearly reflected in the reduction of O/N central bank deposits and in the partial reversal of counterparty limits. The liquidity measures introduced by the MNB, along with the improvements in market confidence, caused a slow pick-up in activity on the O/N unsecured interbank market.

(4) Market adjustment, stable period: 1 January 2010 – 30 June 2012. Thanks to cooperation of the major central banks, international investor sentiment and risk appetite improved considerably. The positive impact of this phenomenon was progressively felt on the Hungarian market as well. Activity on the overnight

interbank market, the timing of transactions and counterparty limits stabilised at pre-October 2008 levels.

(5) The period following the introduction of the Interbank Clearing System (ICS): 1 July 2012 – 31 July 2014. The ICS impacted the timing of intraday clearing in several respects.

2.2. Payment system under review

Our analysis only concentrates on the settlement of O/N unsecured interbank transactions identified in VIBER. VIBER is the real-time large-value gross settlement system operated by the Magyar Nemzeti Bank (MNB). VIBER is primarily used for the settlement of large-value time critical payments infrastructures. Money market (or the so-called interbank) transactions constitute a considerable share of turnover generated in VIBER. Unsecured O/N loans can also be classified in the money market cluster (with the exception of *"on-us"* items settled on loro accounts).

In our analysis, we separately analysed the periods that are relevant from the aspect of VIBER's operation. This was necessary primarily due to the changes taking place in intraday timing patterns. Until 1 January 2012, VIBER closed one hour earlier compared to the current settings, operating between 8:00 and 17:00. Since 1 January 2012, the RTGS is available for system participants between 8:00 and 18:00.[3] Within these business hours, credit institutions may fulfil their customer orders between 8:00 and 17:00, their own interbank and securities transactions until the closing of VIBER at 18:00.

3. Methodology

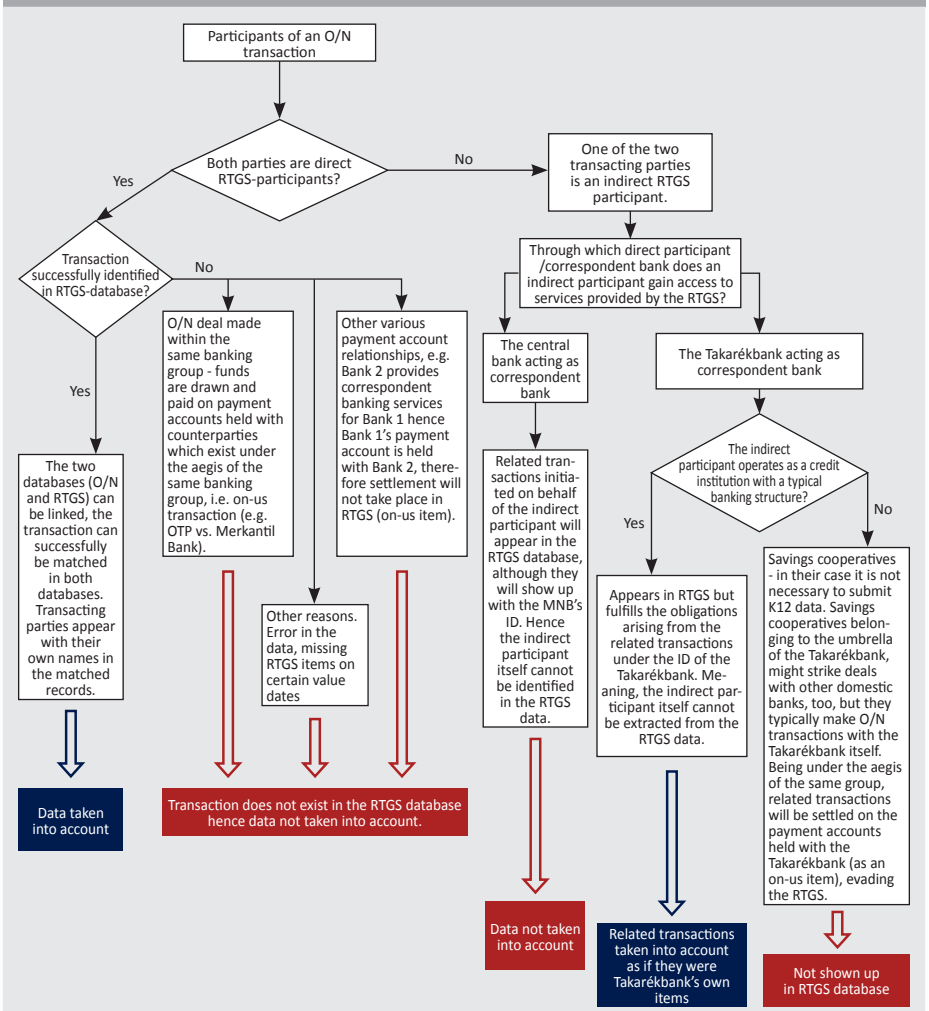
3.1. Basic data and databases

For the transaction-based identification of O/N loans and for matching both its legs in the RTGS database, we used RTGS payment data and the mandatory K12 data reporting entitled "Daily report on interbank overnight forint loan and forint deposit interest rates". The MNB, in its capacity as VIBER's system operator, continuously records key data on the system's operation and attributes, and in this context, it also records the VIBER turnover on settlement dates. Thanks to this, a significant portion of the data necessary for the study became available, including the identifier (SWIFT BIC code) of both the sending and recipient VIBER participant, the transaction amount, the date and *time (timestamp)* of settlement. The K12 data report contains data for unsecured interbank O/N transactions concluded between credit institutions on the transaction day. In every case,

[3] VIBER's opening hours changed as of 3 August 2015. From this date onward, the RTGS opens at 7:00 and closes at 18:00.

both involved parties are obliged to report the transaction, but we naturally took each transaction into account only once. The report also specifies the maturity, amount and interest rate for each transaction. Our primary objective in linking the two databases was to identify the greatest number (possibly all) O/N unsecured interbank transactions within VIBER. We proceeded based on the iteration logic presented in Figure 1.

Figure 1.
Steps in linking the K12 and RTGS databases



Source: Own compilation based on MNB data

By linking the two databases according to the primary keys, we finally obtained the dataset used for our analysis. For the first leg (borrowing) of an O/N unsecured loan, the date of the transaction, the contractual amount involved and the participating counterparties needed to be identified to link it to the associated transfer in RTGS. On the following day, the amount plus interest (second leg) is repaid, so the search must be performed accordingly. Another aspect was whether the principal and interest are repaid separately or bundled into a single transaction. Based on our experiences we can say that in most cases, the contractual amount and interest were repaid together, in one single RTGS transaction. There were some situations, however (1 per cent of all successfully identified records) where the contractual amount and interest due were settled in two separate transactions in the RTGS; in these cases, we only took into account the RTGS transactions containing the net contractual principal amount without interest.

3.2. Outcome of linking the databases

We managed to identify approximately 80 per cent of transactions by linking the K12 database and VIBER payment data. In the period between 2 January 2008 and 31 July 2014, money market participants concluded a total of 54,788 unsecured transactions, and we managed to identify nearly 80 per cent of these in VIBER (*Figure 2*). The reasons for the failed identification of the remaining approximately 13,000 transactions (20 per cent) varied:

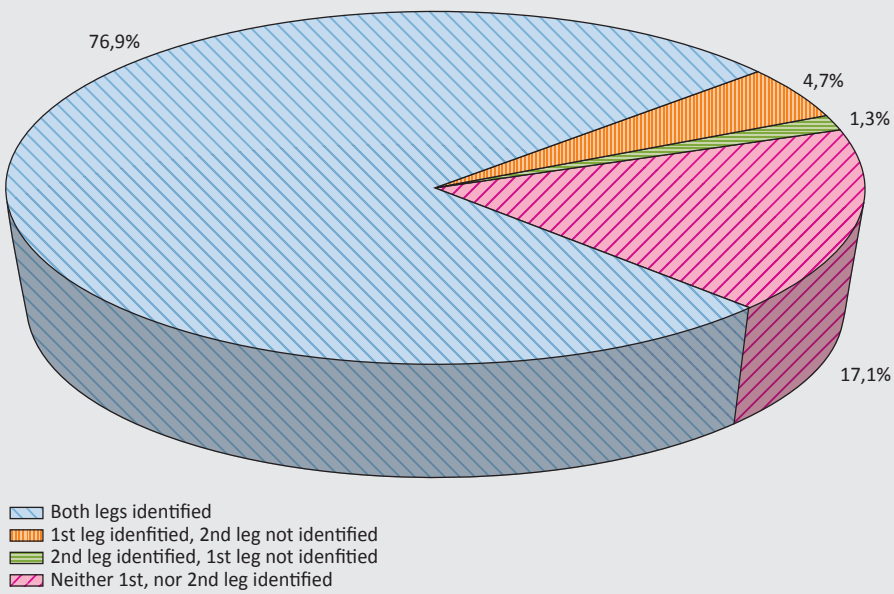
1. *The transaction was executed outside the payment systems ("on-us" items).* "On-us" items are the ones when either one of the transacting participants (either the creditor or the debtor) holds a payment account for the other party and thus the transaction is executed without coming into contact with payment systems, via a simple book transfer within the bank. We can distinguish two groups within this category: (1) credit institutions which are part of the same banking group, and (2) a bank providing correspondent bank services for various reasons. If banks with such mutual payment account management relationships conclude an O/N unsecured interbank transaction, it does not generate any turnover in VIBER, as the transactions are completed via internal settlement (i.e. book transfer). *"On-us"* items have a relatively smaller significance based on the entire data series, accounting for merely 11 per cent of total O/N transactions.

2. *Items not identifiable for other reasons.* When pairing the data of the two databases, sometimes it is not the payment flows associated with an O/N unsecured interbank transaction that are identified. Counterparties concluding the transaction may also conclude other types of (non-overnight) interbank transactions in the same amount on the same value date. These items cannot be filtered out, and therefore their distorting impact might influence, although only at a small-scale, the results obtained.

3. *Partial or full roll-over.* The principal amount of an O/N transaction may be rolled over on day T+1 to the following day (or the amount itself might be changed), in which case only the interest (or the difference resulting from the amended principal amount) is settled. This could partially be the reason for why we found a large proportion of transactions where the 1st leg was successfully identified in the RTGS, but the 2nd leg was not. We could only identify the first leg of transactions in 5 per cent of the cases, while transactions for which we could only identify the second leg only accounted for 1.3 per cent. As these items may significantly distort our calculations, we ignored them in our analysis.

4. *The MNB's databases do not contain the data (related to the indirect submitter) necessary for pairing.* If one of the transacting parties is an indirect system participant (meaning it uses the RTGS through a direct participant) and is not concluding the transaction with this correspondent bank, then settlement of the transaction will generate turnover in the RTGS. So the indirect participant can only fulfil its payment obligation in VIBER through a direct VIBER participant (its correspondent bank). This means that the transacting parties and the RTGS direct participants which effectively initiate and send the items will differ. Therefore, these items are recorded as transactions initiated by the correspondent bank.

Figure 2.
Identification ratio of O/N unsecured interbank transactions in the RTGS



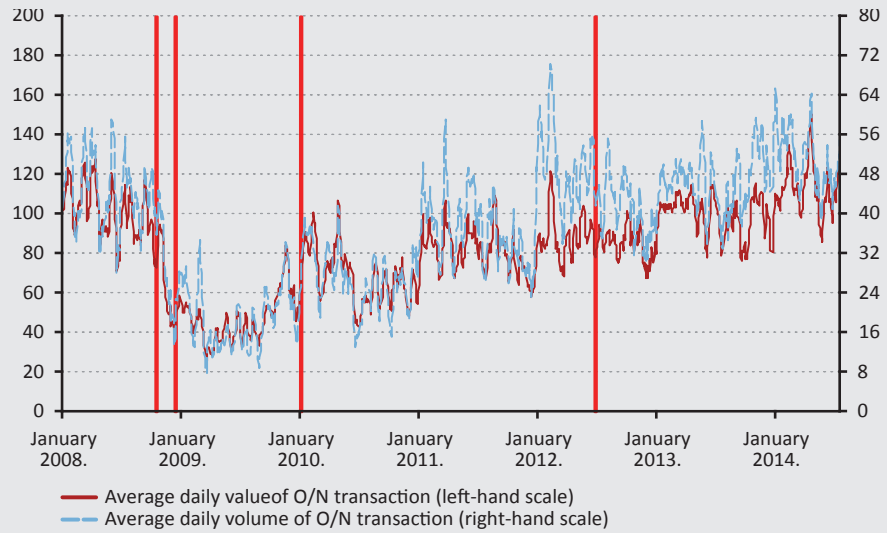
Source: Own compilation based on MNB data

4. Results

4.1. Size and characteristics of the market

During the entire period under review, market participants concluded O/N unsecured interbank transactions in a daily amount of HUF 93.3 billion on average, accounting for 2–4 per cent of total VIBER turnover. In terms of turnover generated by O/N transactions in VIBER, the first leg (borrowing) accounted for 2-4 per cent of VIBER turnover (Figure 3). If we add *repayments* on day T (associated with borrowings taking place on day T-1) to the borrowings on day T then this previously mentioned ratio rises to 4-8 per cent. Considering that the average daily VIBER turnover is HUF 4,781 billion[4] – amounting to 41 times the annual Hungarian GDP on average – we can state that the turnover of O/N transactions settled in VIBER is significant. We obtain a similar result in terms of volume, with the number of transactions linked to O/N borrowing relative to the total number

Figure 3.
Volume and value of O/N unsecured interbank transactions
(2008 – July 2014)



Note: Ten-day moving average
Source: Own compilation based on MNB data

[4] Based on RTGS data covering period 2 January 2008 – 31 July 2014.

of VIBER transactions ranging between 0.5 and 1 per cent. If we also factor in intraday repayments, this range roughly doubles, to 1–2 per cent.[5]

Developments in the value and volume of O/N interbank transactions in the observation period clearly reflect the events that unfolded on the interbank market. Following the collapse of Lehman Brothers, turnover dwindled on the entire interbank market, prompting the central bank to introduce a number of measures that allowed banks' liquidity position to stabilise over time. The MNB helped banks managing their liquidity by expanding the scope of eligible collateral, decreasing the minimum reserve ratio and running VIBER's automated gridlock resolution algorithm[6] more frequently. Due to these measures, banks – in line with international experiences – were able to increase their liquidity available for payments, which was reflected mainly in the rise in intraday credit lines (Figure 4), and turnover in the unsecured interbank market also increased simultaneously.

Credit institutions' market position underwent a significant change in the period under review. The number of participants shrank significantly at the end of 2008, and the market saw concentration in terms of both the creditors and borrowers. All of this had a tangible impact on the O/N unsecured interbank market, which started contracting from October 2008 onwards in terms of both value and volume. After the crisis, the interbank market gradually returned to its earlier dynamics. Thanks to the cooperation of key central banks and monetary easing, international risk appetite improved. Also, as a consequence of the measures initiated by the MNB, an increasing number of money market participants returned to the O/N unsecured interbank market.

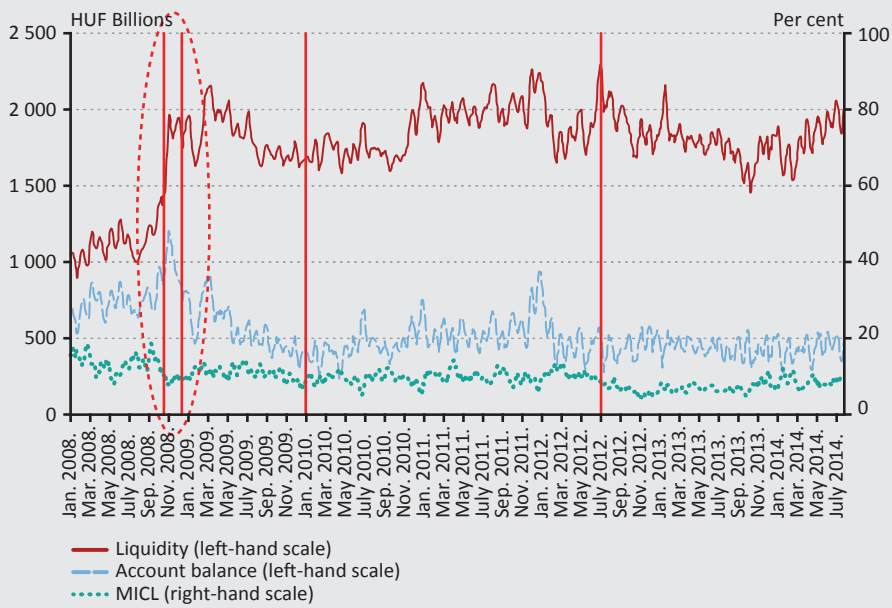
Scrutinising the liquidity of the entire interbank market is essential for analysing O/N unsecured interbank transactions in terms of payments. The payment liquidity of VIBER participants consists of two elements: the account balance and the central bank overdraft facility backed by collateral. During the day, the current account balance changes continuously as credits and debits occur, but the possible level is effectively determined by the reserve requirement regime. The intraday credit

[5] It is worthwhile to compare these values with international statistics. Advances of overnight unsecured interbank loans accounted for 11 per cent of the daily average value (roughly GBP 200 billion) of the United Kingdom's large-value payment system (CHAPS Sterling). If we also include repayments linked to the borrowing of the preceding day, the figure rises to 22 per cent of total CHAPS Sterling flows (*Millard et al. 2004*) Craig H. Furfine obtained similar results in his study. According to his estimate, overnight unsecured transactions account for approximately 24 per cent of the volume generated within the US's Fedwire payment system (*Furfine 1999*). These ratios are somewhat lower on Canada's Large Value Transfer System (LVTS), with overnight interbank transactions accounting for only 3 to 4 per cent of the total turnover generated within the system (*Hendry et al. 2007*).

[6] If a VIBER participant is unable to fulfil its outgoing items due to a liquidity shortage, the items are queued and are not settled until the credit institution finds sufficient liquidity. During the crisis, queuing emerged at several banks due to the lower counterparty limits set between credit institutions, thereby jeopardising the sound and efficient operation of the financial system. In the interest of more effective queuing, the MNB ran its gridlock resolution algorithm more frequently (every 10 minutes), which multilaterally resolves opposing debts.

line is basically affected by the list of eligible collateral (mainly securities) accepted by the central bank. Once a system participant executes its payments using its intraday credit line, it must *"top up"* the resulting negative account balance to zero by the end of the day at the latest. Therefore, VIBER participants strive to close the credit line used up during the day, as the credit line used intraday is free of charge, its sole price being essentially the opportunity cost of the pledged collateral, but if the intraday credit remains open at the close of the day for the central bank, it is automatically converted into overnight collateralised credit (on which interest is payable). The optimal case is when an adequate amount of incoming items is received by the credit institution by the end of the day, the financing impact of which is sufficient for the bank to close the credit line used during the day. If a VIBER participant does not expect a sufficient volume of incoming items, it may take out an O/N unsecured loan on the interbank market to meet its payment obligations. If the credit institution is still unable to find funding on the market in time, it receives the central bank's automatic overnight secured loan. On the other

Figure 4.
Account balance, liquidity (sum of account balance and intraday credit line), and the maximum utilisation of intraday credit line (MICL) of VIBER participants
(2008 – November 2014)



Note: We excluded the MNB's transactions in our calculations. Data calculated using a ten-day moving average.
Source: Own compilation based on MNB data

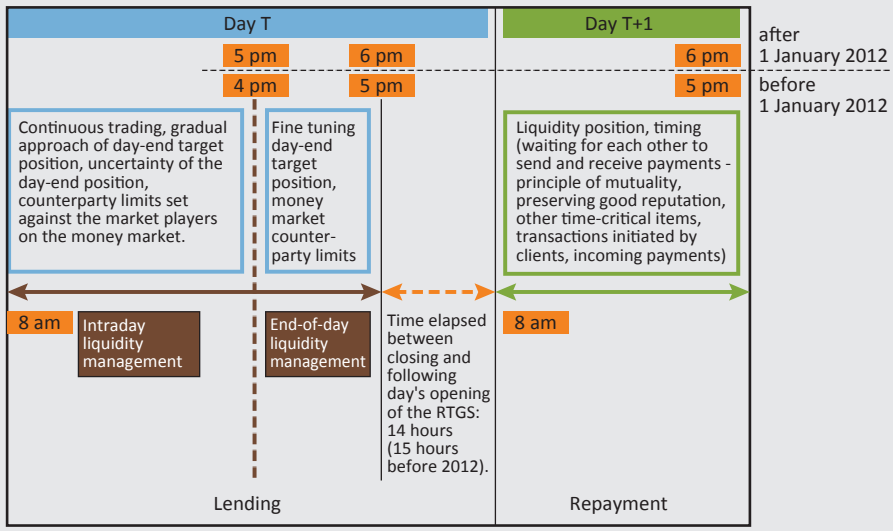
hand, if a credit institution's intraday liquidity increases, its need for the liquidity-providing (financing) role of O/N unsecured interbank transactions decreases. Overall, forint liquidity has changed significantly during the period under review for the banks participating in the Hungarian payment systems, but remained ample.

Uncertainty and turbulence on the interbank market affects the O/N unsecured market significantly as the settlement of transactions is not guaranteed by the counterparties with collateral. In the case of O/N loans, the creditor's counterparty risk is that the other party involved in the same transaction fails to repay its obligation on the following day, causing a loss for the creditor. One of the tools for mitigating this counterparty risk is the use of counterparty limits, which involves limiting a position against the other credit institution. At the end of 2008, due to news emerged about banks with good credit ratings having financial difficulties or even going bankrupt, credit institutions became uncertain as to whether they were properly able to assess their trading partners' creditworthiness and hence market participants significantly decreased their counterparty limits against each other. Participants of the Hungarian interbank market primarily responded to market uncertainties with quantity adjustments, i.e. a sharp decrease in the number of transactions (*Figure 3*). Banks concluded fewer and smaller value transactions due to the modified counterparty limits, and also it was much easier for banks to find counterparties for such smaller transactions on the market. Meanwhile, interbank interest rates increased, making funding more expensive, which further decreased unsecured interbank turnover. Later, with market consolidation, turnover gradually returned to its pre-crisis level. It should be noted, however, that banks' counterparty limits are not the only obstacle to trade. It is often the case that a credit institution's willingness to take risks, internal rules of procedure or other self-imposed restrictions (such as the size of the available liquid portfolio that may be advanced as credit) function as limits that may significantly impact its liquidity management.

4.2. Timing practices of advancing and repaying O/N unsecured interbank market transactions

Timing practices of O/N unsecured interbank transactions – in terms of both borrowing and repayment – are shaped by liquidity considerations, risk management expectations, reputational risk considerations (protecting one's good reputation) and yield expectations. The drivers behind the borrowing and repayment of an O/N loan may vary, substantially influencing the lending and repayment habits and the timing of items (*Figure 5*).

Figure 5.
Factors shaping the timing of the 1st leg (borrowing) and 2nd leg (repayment) of O/N loans



Source: Own compilation based on MNB data

The motives behind borrowing (first leg) vary based on whether the transaction takes place during the day or at day-end. Banks' liquidity position is uncertain until 17:00 – this is the cut-off time for customer payments in VIBER. Participants attempt to gradually approach their expected end-of-day target position by means of continuous trading. Obviously, intraday liquidity management is not solely defined by the approach of planned end-of-day positions, other factors matter as well, e.g. the volume of repayments of interbank transactions falling due that day and obligations stemming from the fulfilment of newly concluded bank-to-bank and customer transactions.[7] During this period, the relative availability of a system participant on the market is also a key factor. Intraday market behaviour is also shaped by parent bank expectations, which are particularly significant in terms of setting counterparty limits. The intraday trend in interbank interest rates may also be a key factor in the timing of transactions. Interest rates typically change at around 14:00-16:00, which can significantly affect intraday liquidity management. During VIBER's last business hour (17:00-18:00), only the settlement of interbank

[7] Banks signed a voluntary interbank agreement to fulfil payment orders submitted by their clients within two hours (the two-hour rule). This is also a motive in terms of reputation.

transactions, securities transactions and the last cycle of ICS intraday clearing[8] can be carried out. This final hour time-window is usually referred to as end-of-day interbank liquidity management when the most accurate adjustment of the closing account balance position is given priority, as both reserve deficiency and reserve surplus[9] comes at a price. At the end of the day, the balance of the VIBER participant's current account (held with the MNB) gradually approaches the target closing value, but during this process other factors may come into play, such as resolving liquidity surplus / shortages, adjusting liquidity management behaviours to comply with the averaging mechanism of the reserve requirement system, implementation of liquidity strategy, and also implementation of the closing balance target due to reporting obligations to the parent bank.

There are also several factors playing a role in the timing of the repayment (second leg), based on which the bank decides to either bring forward or postpone repayment. The basic motivation is the payment obligation existing between the parties as the loan taken out earlier must be repaid. Banks can repay the loan in two ways:

1) They may initiate repayment during the day on the payment due date (T+1)

The main factors that may entail either early or delayed repayment include: *(i)* the available liquidity, *(ii)* the intraday liquidity position (e.g. is there any queuing), *(iii)* the expected volume of incoming items (their financing impact), *(iv)* the expected timing of client transactions to be executed the same day, *(v)* other time critical items.

Timing may also be influenced by the counterparty limit conditions set within the framework of the O/N loan contract. That is, does the part used by the transaction

[8] ICS is the domestic small-value gross payment system operated by GIRO Zrt. Introduced in July 2012, the intraday clearing system offers five cycles during the day for clearing transactions instead of the earlier overnight clearing. Cycles and post-cycle clearing periods: First cycle: 06:30-08:30 (08:30-09:40), second cycle: 08:30-10:30 (10:30-11:40), third cycle: 10:30-12:30 (12:30-13:40), fourth cycle: 12:30-14:40 (14:40-15:50), fifth cycle: 14:40-16:30 (16:30-17:55) (Luspay et. al., 2014). This changed as of 7 September 2015, clearing now takes place in ten cycles instead of the earlier five.

[9] The reserve requirement is derived from the product of the required reserve ratio — which may be set freely between 2 and 5 per cent every half year — and the credit institution's reserve base. This is the minimum amount that must be held by the specific credit institution on its account held at the central bank (the rule changes from 1 December 2015 onwards when each system participant will have to use a fixed, 2 per cent reserve ratio). Credit institutions must meet this mandatory minimum level as a monthly average, i.e. they must ensure that the average of their end-of-day closing balances reaches this statutory minimum in the given month. Hence this mechanism provides banks with a certain flexibility in the sense that they have more freedom in determining their account balances and therefore the liquidity available for their payment transactions over the course of a given month. Some banks, for example, hold a higher account balance than their selected reserve ratio (i.e. run a reserve surplus) at the beginning of the month, and adjust this surplus in the second half of the month (run a reserve deficit). It is important to note however that running a reserve surplus or deficit has (the same) cost. The MNB does not pay any interest for the balances held above the reserve requirement (i.e. running a surplus incurs losses for the system participant), whereas running a deficit means penalty rates are imposed which equal the base rate. As a result, banks strive to keep an account balance equal to their obligations on average over the course of a month (*Bodnár–Luspay–Madarász, 2014*).

become available only after receipt of the repayment or already on the morning of the repayment's due date. In addition to the above, the expectations of the creditor may also be determining from the perspective of the "debtor" if the creditor is not willing to conclude another interbank transaction until the debtor has repaid its debt. In such a case, the obligor bank may accordingly bring the repayment forward. But the other side may also be true, i.e. if it is waiting for an incoming item from its counterparty in relation to another transaction then they may have to wait for each other due to their payment obligations, so the principle of mutuality may entail the postponing of the time of settlement. Using the PvP module of VIBER may help in such cases. If two banks initiate a bank transfer to one another then the module allows the settlement of these transactions only if both parties have provided the necessary amount of collateral[10].

2) Repayment is already initiated in VIBER on the day of borrowing (day T)

Transactions may be submitted already value-dated to VIBER. Value-dated repayment refers to cases when the bank submits a payment item for a future value date, i.e. the day the transaction is initiated differs from the day the transaction is fulfilled. Value-dated transactions submitted on day T account for a large portion of items settled before 08:30 day T+1. These transactions are immediately settled after VIBER opens on day T+1 (provided sufficient funds are available), meaning that in the case of O/N loan repayment, the bank repaying the loan can no longer use the amount for its T+1 day payments, while the creditor bank can use the amount immediately after VIBER opens for the day. Bank concentration is significant in the case of value-dated transactions, as more than 70 per cent of these items were associated with two banks until 2013. After 2013, only one of them followed this practice. The proportion of value-dated items compared to all second leg transactions stands at around 20–25 per cent per period. On average, 4–12 transactions were fulfilled value-dated on a daily basis, or HUF 15–65 billion on average.

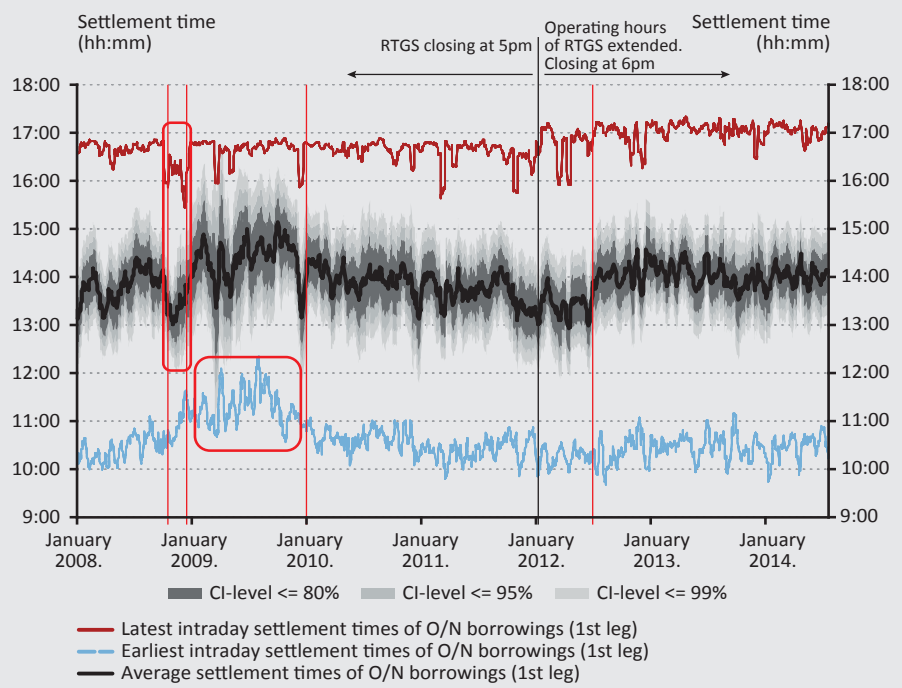
4.3. Impact of money market events on the timing of the first leg of O/N unsecured interbank transactions

The timing of the first leg of O/N unsecured interbank transactions reflects money market events and turmoil, and different periods are characterised by different timing behaviours (Figure 6). At the end of 2008 (during the second period) due to contraction of the unsecured O/N market, reduced counterparty limits and mistrust, banks brought the timing of the first leg forward within the day (the average time stamps shifted from 13:50 to 13:20 (*Table 1*). Banks did not wait

[10] In other words: bank A owes money to bank B and vice versa, whereas they want to initiate a transaction to one another. Thanks to the PvP module, one transaction will be settled only if the other one is also settled, i.e., the module "holds" the two transactions until sufficient funds are available on behalf of both banks for completing the transfers. Thanks to this, the settlement risk between the parties is eliminated.

with O/N interbank borrowing "until the last moment" – that is VIBER's closing time. Instead they acted on as soon as they had the chance or it was necessary for them to borrow or place funds, much earlier compared to prior practices. Due to the uncertainty entailed by the crisis, credit institutions were worried that as approaching day-end closing, the number of banks being able to provide them with liquidity would decrease (as these might finish trading sooner) meaning there would be no bank left to grant them a loan. Due to the mistrust on the market, banks were reluctant to conclude transactions with one another. As a consequence of the low interbank counterparty limits, the pool of liquidity available shrank, which was another reason that made borrowing urgent for the banks so that they could access at least a part of this limited liquidity. In order to address the situation, the MNB narrowed the interest rate corridor and as a result, credit institutions primarily concluded their transactions with the MNB to "fine tune" their liquidity position instead of obtaining funds from or placing their surplus liquidity on the

Figure 6.
Timing of the 1st leg of unsecured interbank transactions (daily averages) with the earliest and latest intraday settlement times and the 80%, 95% and 99% confidence intervals
(2008 – July 2014)



Note: with a ten-day moving average
Source: Own compilation based on MNB data

interbank market. The few transactions that system participants concluded on the market were settled as early as possible during the day to allow them to find a counterparty in time for their open transactions. This is the reason why (based on historic data) the scope of both the banks willing to lend and those wanting to borrow substantially decreased between the 16:00 and 17:00 time frame (which is critical for the end-of-day liquidity management) meaning that the market became more concentrated. The timing of O/N transactions settled *last* within a day was also brought forward substantially. Early exit of creditors forced the remaining market participants to close their positions sooner, so system participants also had to adjust their closing balance targets earlier. However, from the beginning of 2009, when confidence returned and counterparty limits started to reverse, banks' borrowing times gradually adjusted back to the pre-October 2008 level, while the confidence interval broadened significantly, which means that at that time it was not possible to accurately determine when the specific transactions will be settled even at a 99 per cent certainty. Essentially, O/N borrowing could take place with the same chance at any time between 11:00 and 17:00. Simultaneously, until approximately September 2009, the intraday period between the *earliest* and the *latest* settlement times, during which banks concluded O/N interbank unsecured transactions, had "narrowed" substantially. Compared to other periods, banks were willing to conclude transactions only in a more limited time window. Postponing the earliest O/N transactions' settlement times could have played a key role here; we assume that banks started to transact later in the morning because they were waiting for market news about their counterparties. To sum up, the intraday time window for payments has shortened as a result of the crisis, while at the same time the settlement of transactions completed within this time window became more random, indicating the uncertainty of the market.

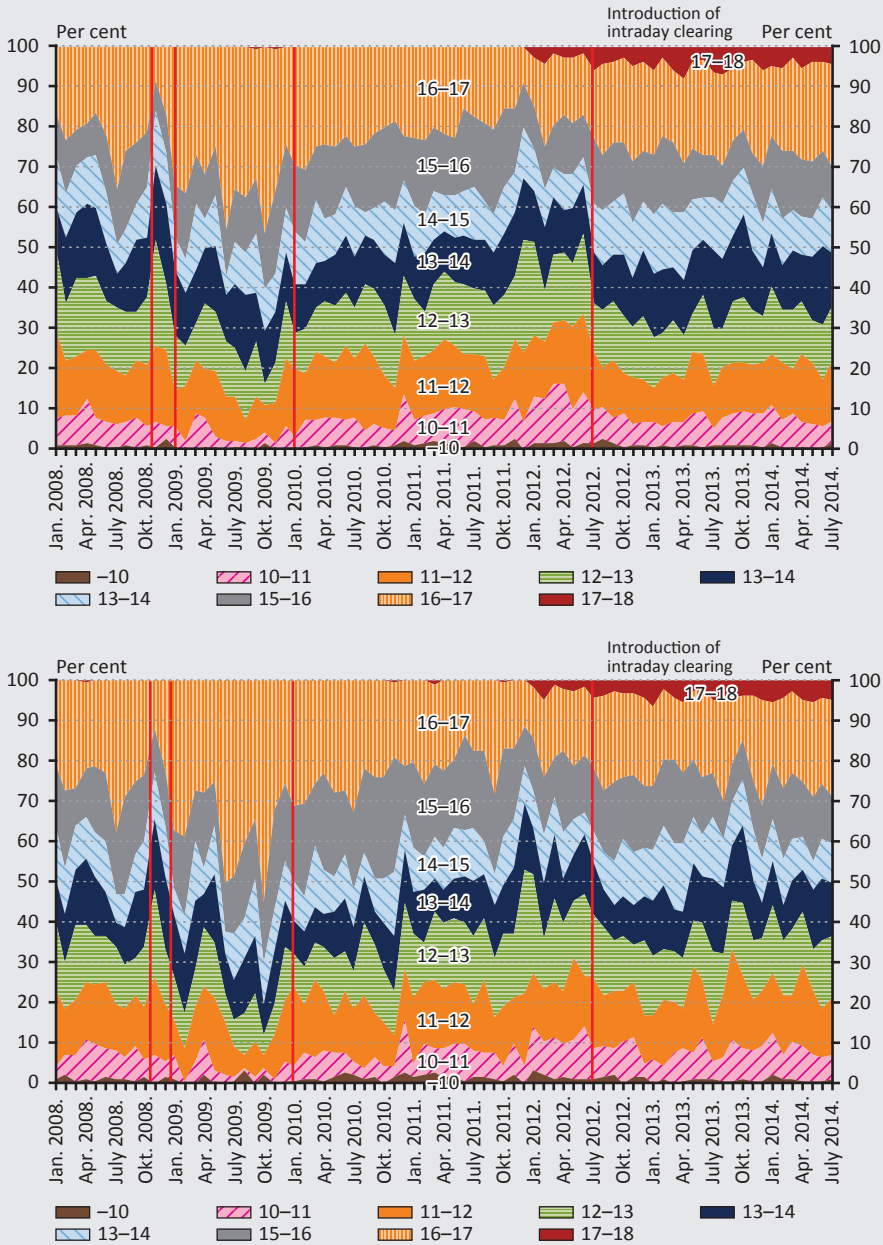
The bulk of the first leg of O/N unsecured interbank transactions were fulfilled in VIBER between 15:00 and 17:00 both before and after the crisis (Figure 7 and Table 2). Under normal circumstances, banks calculate their liquidity needs in advance, trying to assess the volume of incoming and outgoing payments on a given business day. If necessary, they access the O/N unsecured interbank market and either lend or borrow the difference between their estimated and actual turnover at the end of the day. In such cases, banks generally prefer to conclude transactions late in the afternoon, but they do not wait until the very last moment to submit their transactions. Under less stable circumstances – mainly as a result of shaken interbank confidence – it is more difficult to plan ahead during the day, so whenever the opportunity arises, banks immediately lend or borrow, that is, they conclude transactions much sooner during the day. As a result of the crisis, the settlement of the first leg of O/N unsecured interbank transactions has become concentrated in the early afternoon (between 12:00 and 15:00), i.e. credit institutions' timing behaviour has changed. Previously, items typically timed later within a given day were brought forward shortly after the Lehman

Table 1
Statistics of settlement times related to O/N borrowing (hour : minute : second format)*

Period		(1) Pre-Lehman period	(2) The Lehman shock	(3) Post-Lehman period	(4) Market adjustment, stable period	(5) The period following the introduction of the ICS
Time interval		2 January 2008 — 20 October 2008	21 October 2008 – 16 December 2008	17 December 2008 – 31 December 2009	1 January 2010 — 30 June 2012	1 July 2012 – 31 July 2014
Statistical indicators	Average settlement times of O/N borrowings (1st leg)	13:51:07	13:20:01	14:27:09	13:48:58	14:05:59
	Settlement time of the earliest O/N transaction in the period.	8:23:38	9:46:13	8:56:09	8:21:18	8:29:29
	Average settlement time of the earliest daily O/N transactions in the period.	10:29:52	10:49:19	11:20:29	10:31:52	10:31:59
	Settlement time of the latest O/N transaction in the period.	17:03:02	16:59:04	17:19:10	17:40:34	18:08:33
	Average settlement time of the latest daily O/N transactions in the period.	16:40:06	16:13:13	16:38:47	16:39:24	17:02:18
	Standard error	2:01:03	1:46:40	1:57:23	2:03:00	2:03:56
	Variance	0:10:11	0:07:54	0:09:34	0:10:30	0:10:40

** The items identified in the large-value payment system included 31 transactions which were settled early in the morning. Specifically, we found 29 items fulfilled between 07:50 and 08:00, one item settled at 08:00 and one more item at 08:07. They may have been other (non-O/N) transactions, therefore, we did not take them into account among the statistics.*
Source: Own compilation based on MNB data

Figure 7.
Monthly distribution of settlement times of O/N transactions (1st leg) in an hourly breakdown based on volume (left panel) and value (right panel)
(2008 – July 2014)



Source: Own compilation based on MNB data

Table 2.
Distribution of settlement times linked to O/N borrowing in the different periods, by intraday time bands
(per cent, January 2008 – July 2014)

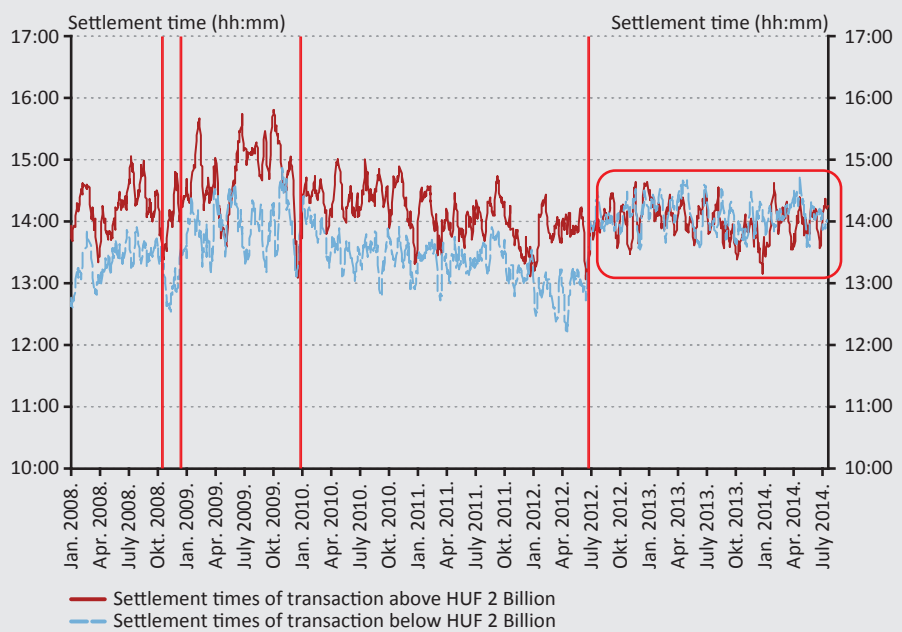
	Period	Time interval	Time band (per cent)								Total
			–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	
based on volume	(1) Pre-Lehman period	2 January 2008 — 20 October 2008	0,83%	7,02%	14,68%	16,66%	14,69%	10,94%	12,66%	22,46%	0,07%	100,00%
	(2) The Lehman shock	21 October 2008 – 16 December 2008	1,04%	5,58%	19,84%	21,53%	18,81%	13,62%	8,17%	11,41%	0,00%	100,00%
	(3) Post-Lehman period	17 December 2008 – 31 December 2009	0,42%	3,52%	11,41%	12,00%	14,01%	10,57%	14,17%	33,82%	0,08%	100,00%
	(4) Market adjustment, stable period	1 January 2010 — 30 June 2012	1,05%	8,03%	15,41%	15,69%	12,66%	10,47%	15,76%	20,16%	0,76%	100,00%
	(5) The period following the introduction of the ICS	1 July 2012 – 31 July 2014	0,85%	6,86%	12,55%	13,24%	14,64%	12,66%	13,21%	21,30%	4,70%	100,00%
	Period	Time interval	Time band (per cent)								Total
			–10	10–11	11–12	12–13	13–14	14–15	15–16	16–17	17–18	
based on volume	(1) Pre-Lehman period	2 January 2008 — 20 October 2008	0,89%	6,59%	13,81%	13,66%	12,36%	11,08%	15,88%	25,70%	0,03%	100,00%
	(2) The Lehman shock	21 October 2008 – 16 December 2008	1,17%	6,76%	17,58%	17,85%	17,37%	11,00%	11,85%	16,41%	0,00%	100,00%
	(3) Post-Lehman period	17 December 2008 – 31 December 2009	0,77%	3,10%	10,46%	9,81%	12,93%	10,18%	16,70%	36,02%	0,03%	100,00%
	(4) Market adjustment, stable period	1 January 2010 — 30 June 2012	1,39%	7,25%	14,31%	15,64%	11,68%	10,14%	18,24%	20,52%	0,83%	100,00%
	(5) The period following the introduction of the ICS	1 July 2012 – 31 July 2014	0,82%	7,52%	14,55%	14,25%	12,57%	11,64%	14,63%	19,89%	4,13%	100,00%

Source: Own compilation based on MNB data

collapse. However, as the result of the adjustment which ensued, the behavioural pattern seen before the end of 2008 emerged once again in terms of timing. With the gradual increase of counterparty limits and the widening of interest rate corridors, the MNB sent a signal to the market that system participants can feel free to conclude O/N unsecured transactions with one another and should thus try to resolve their liquidity problems on the market. Simultaneously with the rise in market liquidity and the improvement in interbank confidence, adjustment in timing gradually materialised and by early 2010, it reached the level seen prior to the Lehman collapse.

The timing of unsecured interbank market items is largely shaped by value, a significant difference can thus be pinpointed between smaller transactions (under HUF 2 billion) and large-value transactions (over HUF 2 billion). Smaller value transactions are typically used to acquire additional intraday liquidity (in other words, to resolve ad-hoc liquidity shortages), while larger value items carry significance in terms of closing out positions at the end of the day or complying with the reserve requirement. During the period under review, until July 2012

Figure 8.
Timing of the 1st leg by transaction value
(2008 – July 2014)



Note: with a ten-day moving average
Source: Own compilation based on MNB data

transactions of under HUF 2 billion were typically settled earlier on during the day, while items of over HUF 2 billion were typically settled later[11] (*Figure 8*). The effect of the Lehman shock can be observed here in this area, too, as borrowers attempted to obtain the necessary liquidity and close their positions as early as possible during the second (risk averse) period, and therefore the timing of their transactions related to both intraday and end-of-day liquidity shifted to earlier times (*Table 3*). The divergence in the settlement times of small and large-value items was significant until 2012 H2, after which their "timing profile" became nearly identical. All of this may be linked to the introduction of intraday clearing within ICS on 1 July 2012, which prompted credit institutions to adjust their liquidity management. Until this date, the ICS only featured overnight clearing which did not require liquidity during the day for settlement. However the introduction of five intraday settlement cycles meant that the need for additional liquidity during the day increased substantially compared to the previous period, spreading out this continuous liquidity demand within the day due to these cycles. In addition, the daytime turnover of the ICS – which consists of items initiated by bank clients – cannot be forecasted by VIBER participants, so a bank may need to access extra liquidity at any time during the day.

Table 3.
Settlement time statistics linked to the O/N borrowing broken down by value size for each period
(following the format of hour : minute : second)

		(1) Pre-Lehman period	(2) The Lehman shock	(3) Post-Lehman period	(4) Market adjustment, stable period	(5) The period following the introduction of the ICS
		2 Jan. 2008 — 20 Oct. 2008	21 Oct. 2008 – 16 Dec. 2008	17 Dec. 2008 – 31 Dec. 2009	1 Jan. 2010 — 30 June 2012	1 July 2012 – 31 July 2014
Statistics related to transactions below HUF 2bn	**Average**	13:24:10	12:54:43	14:00:39	13:25:03	14:07:54
	Standard deviation	1:55:47	1:32:04	2:01:41	2:00:11	2:05:17
Statistics related to transactions above HUF 2bn	**Average**	14:15:13	13:56:50	14:46:11	14:08:55	14:04:34
	Standard deviation	2:00:36	1:55:22	1:50:20	2:01:45	2:02:54

Source: Own compilation based on MNB data

The first legs of overnight unsecured transactions exhibit a shift in their settlement times to earlier parts during the day (irrespective of transaction value) towards the end of the calendar year, and also towards the end of quarters (Figure 6).

[11] Due to the relatively high level of standard deviation, this difference cannot be considered to be statistically significant.

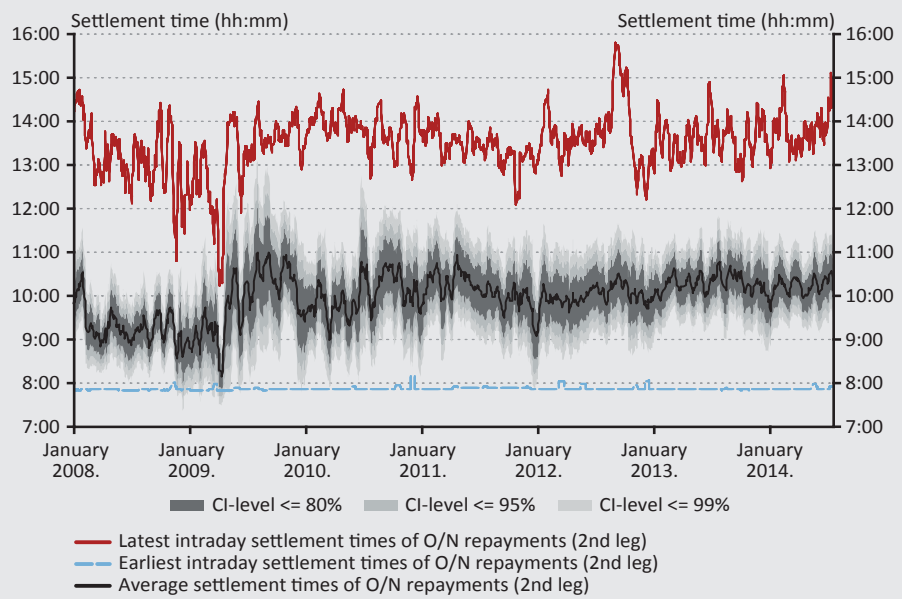
This phenomenon may stem from several reasons. At the end of the year, before holidays spanning several days, credit institutions strive to fulfil the transactions as soon as possible within the day. In addition, households' cash holdings, which spike before the end of the year holidays and then wane after the holidays, significantly shapes the banking system's liquidity on an aggregate level, which may indirectly impact the timing of interbank transactions (*Komáromi 2008*). In addition, many credit institutions performed balance sheet adjustments linked to the year-end closing of positions in the form of currency swaps. The forint liquidity within the system may temporarily change due to this, and – for security considerations – banks may thus initiate transactions earlier on (*MNB 2013*). Earlier intraday settlement times was observed in late 2011 and early 2012, which may possibly be linked to the money market turmoil felt in Hungary at the time. Interestingly, credit institutions did not make any material change to the number of concluded O/N items (with the average values concluded daily even increasing in early 2012 based on the available data, see Figure 3), however they presumably tried to mitigate the emerging market tension by bringing the settlement of their items earlier within the day (this adjustment in terms of timing is quite similar to banks' response to the collapse of Lehman described before). A similar pattern emerges when we look at quarters, particularly Q1, where the impact of multinational corporations may also come into play alongside the above specified seasonal effects (holidays spanning several days). Hungary is characterised by a strong presence of non-resident (particularly US and British) corporations, most of which follow a financial year different from the calendar year (ending, for instance, on 31 March). Activities linked to closing the financial year may impact, albeit indirectly, interbank liquidity and timing of transactions within the day. At the same time, since the introduction of ICS intraday clearing, this impact seems to have faded. Financial transfers linked to the real economy may be more evenly spread out over the day, explaining this phenomenon.

4.4. Impact of money market events on the timing of the 2nd leg of O/N unsecured interbank transactions

The timing of the repayment of O/N interbank transactions within the day shifted to earlier parts of the day six months before the collapse of Lehman, a phenomenon that persisted until June 2009 (*Figures 9–10, and Table 4*). The temporary shift of second leg's average settlement times to earlier parts of a day in late 2008 and early 2009 partly stemmed from the significantly lowered counterparty and settlement limits. As a result, the earliest possible repayment of loans from the previous day was necessary to ensure the safety of payments. Due to the drastic cuts to counterparty limits in the wake of the Lehman collapse, the risk of a bank being unable to conclude another interbank transaction with the specific

counterparty until it has repaid its O/N unsecured interbank loan contracted earlier increased, as the bank was using its counterparty limit until completion of the transaction. Another explanation is that the earlier times for loan repayments may have been an indication to the counterparty that the borrower was reliable and thus carried a low risk of insolvency. The change in timing was also impacted by the central bank liquidity measures in response to the crisis, which increased banks' liquidity. This reduced the banks' need for interbank O/N loans to carry out payments during the day, and they were able to repay a smaller amount of loans at the beginning of the date without the need to wait for the financing effect of subsequently incoming items. It is interesting to note that due to the money market turmoil in late 2011 and early 2012, the timing of the second leg of O/N transactions shifted to earlier in the day (similarly to the first leg). Based on this, it seems that banks react to uncertain, turbulent market situations by shifting the repayment leg of O/N transactions to earlier in the day.

Figure 9.
Timing of the 2nd leg of unsecured interbank transactions (daily averages) with the earliest and latest intraday settlement times and the 80%, 95% and 99% confidence intervals
(2008 – July 2014)



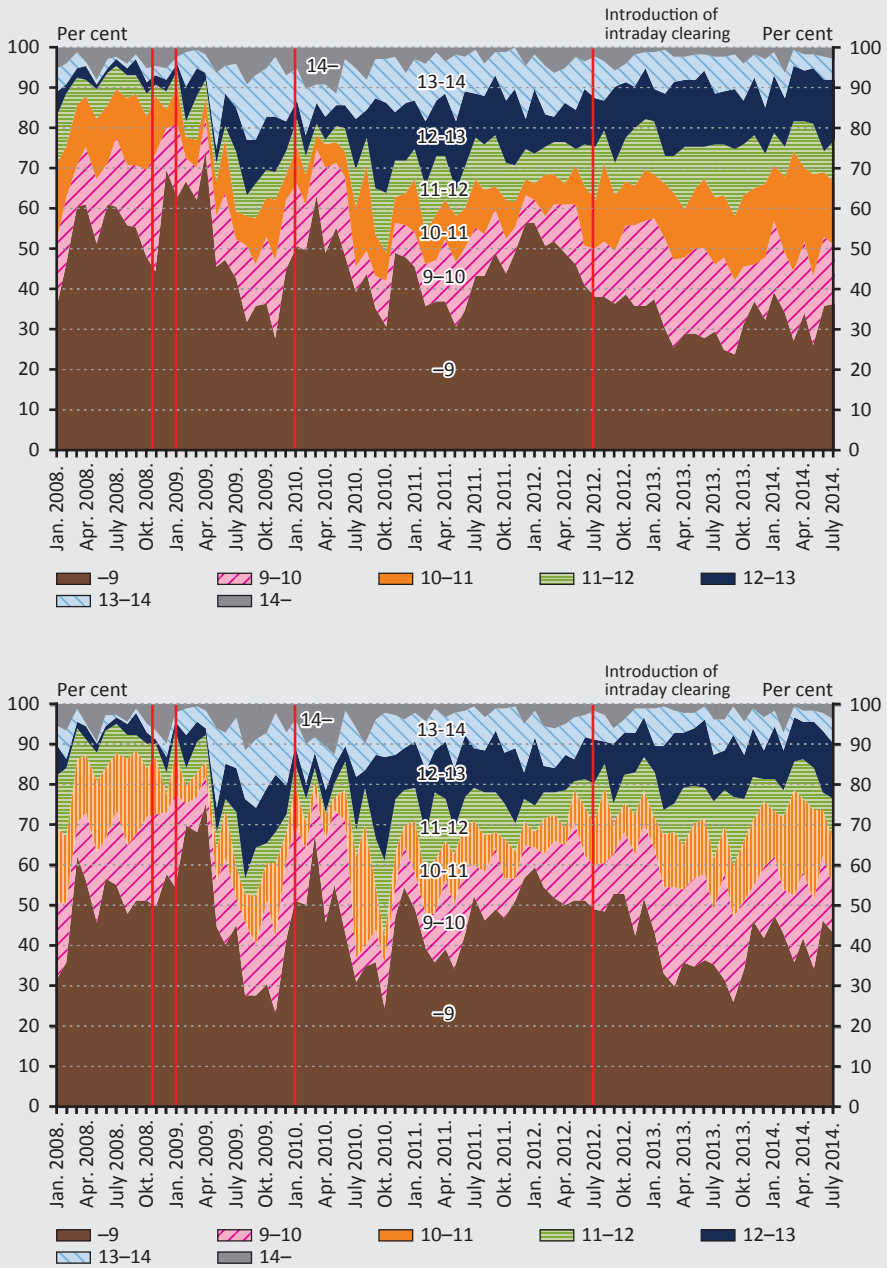
Note: with a ten-day moving average
Source: Own compilation based on MNB data

Table 4.
Statistics of settlement times related to the repayment of O/N loans
(hour : minute : second format)

Period		(1) Pre-Lehman period	(2) The Lehman shock	(3) Post-Lehman period	(4) Market adjustment, stable period	(5) The period following the introduction of the ICS
Time interval		2 Jan. 2008 — 20 Oct. 2008	21 Oct. 2008 – 16 Dec. 2008	17 Dec. 2008 – 31 Dec. 2009	1 Jan. 2010 — 30 June 2012	1 July 2012 – 31 July 2014
Statistical indicators	Average settlement times of O/N repayments (2nd leg)	9:23:03	9:23:25	9:53:03	10:02:57	10:13:23
	Settlement time of the earliest O/N transaction in the period.	7:50:15	7:50:20	7:50:12	7:50:21	7:50:20
	Average settlement time of the earliest daily O/N transactions in the period.	7:50:53	7:53:12	7:51:23	7:52:49	7:51:50
	Settlement time of the latest O/N transaction in the period.	16:28:18	16:16:22	16:40:41	17:16:50	17:01:23
	Average settlement time of the latest daily O/N transactions in the period.	13:19:31	12:52:49	13:04:54	13:36:12	13:43:10
	Standard error	1:50:01	1:54:50	2:13:04	2:13:45	1:58:14
	Variance	0:08:24	0:09:09	0:12:18	0:12:25	0:09:42

Source: Own compilation based on MNB data

Figure 10.
Monthly distribution of settlement times of O/N transactions (2nd leg) in an hourly breakdown based on volume (left panel) and value (right panel)
(2008 – July 2014)



Source: Own compilation based on MNB data

Starting from June 2009, the timing of the second leg shifted continuously to later in the day, in line with market consolidation (Figures 9–10, Table 5). The gradual reversal of counterparty limits from summer 2009 (the rise in previously lowered limits) meant that the timing of the repayment of interbank O/N loans represented an increasingly smaller restriction on trade, allowing the settlement

Table 5.
Distribution of settlement times linked to O/N repayment in the different periods, by intraday time bands
(per cent, January 2008 – July 2014)

based on volume	Period	Time interval	Time band (per cent)							Total
			–9	9–10	10–11	11–12	12–13	13–14	14–	
	(1) Pre-Lehman period	2 January 2008 — 20 October 2008	53,51%	15,15%	14,84%	7,32%	2,82%	2,61%	3,76%	100,00%
	(2) The Lehman shock	21 October 2008 – 16 December 2008	50,45%	24,12%	11,15%	3,89%	2,46%	2,33%	5,58%	100,00%
	(3) Post-Lehman period	17 December 2008 – 31 December 2009	47,38%	13,76%	9,04%	6,72%	8,51%	10,32%	4,27%	100,00%
	(4) Market adjustment, stable period	1 January 2010 — 30 June 2012	45,30%	11,25%	8,93%	8,39%	11,91%	9,96%	4,25%	100,00%
	(5) The period following the introduction of the ICS	1 July 2012 – 31 July 2014	32,46%	17,50%	16,21%	10,75%	13,81%	6,82%	2,45%	100,00%
based on volume	Period	Time interval	Time band (per cent)							Total
			–9	9–10	10–11	11–12	12–13	13–14	14–	
	(1) Pre-Lehman period	2 January 2008 — 20 October 2008	49,40%	16,04%	16,94%	8,01%	3,09%	2,38%	4,13%	100,00%
	(2) The Lehman shock	21 October 2008 – 16 December 2008	51,81%	21,04%	10,12%	4,71%	2,64%	2,22%	7,47%	100,00%
	(3) Post-Lehman period	17 December 2008 – 31 December 2009	45,35%	14,92%	9,25%	6,70%	8,81%	10,43%	4,54%	100,00%
	(4) Market adjustment, stable period	1 January 2010 — 30 June 2012	47,53%	12,31%	9,03%	7,85%	10,72%	8,63%	3,92%	100,00%
	(5) The period following the introduction of the ICS	1 July 2012 – 31 July 2014	40,89%	16,67%	13,62%	9,09%	11,88%	5,49%	2,36%	100,00%

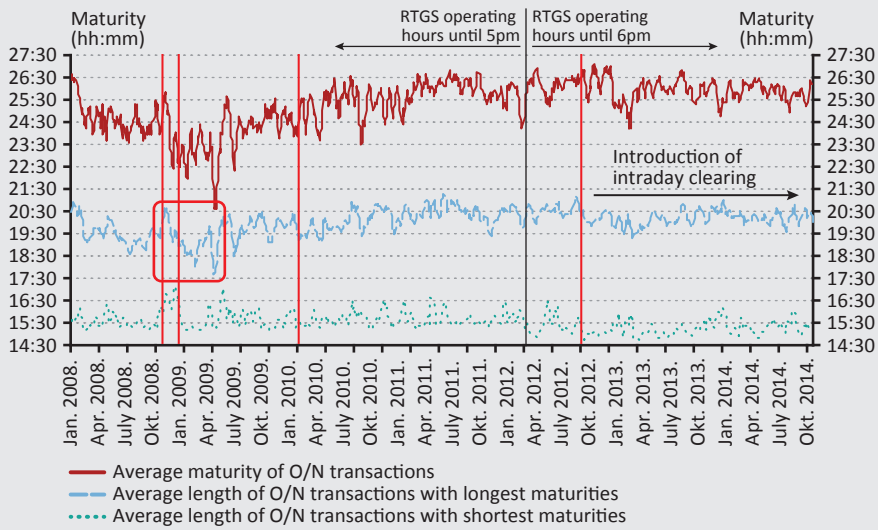
Source: Own compilation based on MNB data

of the second leg to shift to later times in the day. This adjustment process began long before the one-hour extension of VIBER's opening hours from 1 January 2012 onwards, suggesting that the change in the timing of the second leg was not driven by the change in business hours. Following the Lehman collapse, the banking system needed this much time for the situation to normalise in terms of intraday liquidity management. As the interbank market regained stability, credit institutions presumably no longer prioritised the repayment of loans on day T+1 in the early morning hours and thus once again began relying more on the financing role of incoming items, and accordingly the repayment of O/N loans shifted to later in the day.

4.5. Developments in the maturity of O/N unsecured interbank market transactions

To answer the question of how long an O/N unsecured interbank transaction actually lasts, we need to look at the time elapsed between the settlement of the first and second leg. Due to VIBER's business hours, the minimum time that elapsed between closing and opening on the following day – unless business hours were extended for that day – was 15 hours until 2012, which decreased to 14 hours following the extension of VIBER's business hours from 2012. Transactions cannot be settled using central bank liquidity during this period. The average maturity of O/N interbank unsecured transactions ranged between 17 hours 40 minutes and 20 hours 40 minutes (*Figure 11*). After the collapse of Lehman Brothers, banks timed their borrowing earlier in the day and also repaid the borrowed amounts earlier on the following day, which reduced the average maturity of unsecured O/N transactions in late 2008 and early 2009. In his paper, Craig Furfine also examines the average maturity of overnight interbank transactions settled in the US funds transfer system. In his analysis, Furfine found that the average duration of an O/N transaction was 21 hours and 27 minutes (*Furfine 1999*). This is longer than the result of our study. In addition to the largely different market conventions, the discrepancy may stem from a number of other methodological reasons, including the fact that Furfine only looked at data for three months in his study (1998 Q1); in other words his results are based on data for a very different period. The difference may also stem from the very different business hours of the Federal Reserve's funds transfer system compared to VIBER: at the time of Furfine's study, the Fedwire operated between 00:30 and 18:30. Besides business hours, the deviation in the maturity of overnight transactions also diverges: in Furfine's paper, the shortest overnight transaction was 7 hours and 7 minutes long, while the longest one was 40 hours and 39 minutes long, whereas the dataset used for our paper featured a shortest maturity of 13 hours 55 minutes and a longest maturity of 30 hours 32 minutes.

Figure 11.
Developments in the maturity of O/N unsecured interbank market transactions
(2008 – July 2014)



Note: with a ten-day moving average
Source: Own compilation based on MNB data

The maturity of O/N unsecured interbank transactions mainly increased due to the shift of the settlement times of the second leg to later in the day in the period following April 2009. This prompts the question of which of the two determines overnight maturity: the timing of the first leg (borrowing) or of the second leg (repayment)? Our data reveal that it is primarily the repayment of the second leg that defines maturity. This is in line with our preliminary assumption, as banks do have an entire day for settling the second leg, as opposed to the second half of the day generally available for settling the first leg, assuming that it is used primarily for liquidity management. Banks made relatively smaller changes to the timing of borrowing in the period following the collapse of Lehman Brothers, and the timing essentially returned to its original pre-crisis path by 2010. By contrast, the crisis resulted in lasting changes in the domain of repayments, and credit institutions adjusted their timing patterns more markedly.

5. Summary

This study focused on examining the timing of unsecured interbank transactions within the large-value payment system (VIBER) from the perspective of payments. Overnight transactions play a key role in intraday liquidity management, and their settlement at specific times may have strategic relevance in daily practice. For a specific O/N transaction, the creditor advances the principal amount to the

borrowing bank on day T. Counterparties initiate transactions among each other individually, and thus for a given day, they do not bundle payments linked to multiple interbank transactions into one single VIBER transaction. VIBER participants do not apply netting, meaning they do not mutually offset their outstanding receivables against each other, and thus transfer the total principal amount on day T and the principal amount plus interest due on day T+1 - settlement of the principal amount and the interest as two separate items is rare.

In the event of money market shocks, credit institutions showed similar reactions in terms of the timing of their overnight items: they initiate borrowing earlier in the day, as well as repayment the following day. This was the experience over the 2008 crisis, when overnight market turnover dipped significantly in the wake of money market uncertainty and lower interbank counterparty limits, as system participants were increasingly less willing to lend to each other. Worried about finding themselves unable to secure sufficient liquidity from the interbank market at the end of the day, banks scheduled their borrowing earlier during the day. Furthermore, the time window for trading during which transactions were concluded narrowed significantly, coupled with the rise in the randomness of transaction settlement times within this timeframe, which also suggests uncertainty. The overnight unsecured market essentially came to a halt, and the central bank temporarily narrowed the interest rate corridor to allow market participants to access sufficient liquidity in an effort to dissipate the tension. In addition, in the case of foreign-owned banks in Hungary, parent banks began exerting greater control, thus intervening more in their liquidity management. Later on, foreign borrowing, cooperation among the key central banks and the MNB's liquidity measures increased systemic liquidity, and confidence began returning to the interbank market, while state interventions on a global scale calmed market participants. From summer 2009, limits began returning to their earlier levels, albeit selectively and on a mutual basis. The MNB broadened the interest rate corridor, signalling to credit institutions that they should strive to resolve their liquidity issues among each other on the market. The parent banks of foreign-owned credit institutions in Hungary continued to exercise strict oversight, actively shaping their subsidiaries' market behaviour. We observed that the responses in the wake of the money market turmoil that prevailed in Hungary in late 2011 were being similar to the reactions in 2008; in other words it seems that credit institutions react similarly in terms of the timing of their overnight items in response to money market shocks. Regarding the *long-term* impacts of the 2008 economic crisis on the timing and maturity of interbank transactions, credit institutions tend to adjust primarily through the timing of repayments (second leg) rather than the timing of borrowing (first leg), as the timing of the former stabilised at a later part of the day following the crisis. It is therefore repayments (second leg) rather than borrowing (first leg) that mainly impact maturity.

The average time of settlement of O/N loan borrowing is also greatly influenced by value size. Small value items primarily play an important role in resolving intraday ad hoc liquidity management issues, while large-value items are relevant for closing positions at the end of the day and meeting reserve requirements.

Based on our study, the average maturity of O/N interbank unsecured transactions ranged between 17 hours and 40 minutes and 20 hours and 40 minutes, and maturities increased after the crisis mainly due to the adjustment of the second leg.

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A world of debt

Péter Csillik

Interesting thoughts were expressed regarding the current debt situation in an article published in the Financial Times on 6 January 2015.[1] Below we highlight and review some of these thoughts, and then attempt to raise some further ideas as well.

The article of the Financial Times concludes that state bankruptcy is practically a political notion, and that it occurs when meeting the obligation of debt servicing is a greater loss of prestige for the political leaders than to refuse payment.

Developed countries' debt-to-GDP ratio is above 100% (below 50% in developing countries), but of this, the part denominated in domestic currency can be cleared by money printing (which carries the risk of inflation) or financial repression (local savers and investors may be forced through regulation to finance the debt), unlike in the case of external debt. Reinhardt and Rogoff calculated that the average external debt-to-GDP ratio of countries that defaulted in 1970–2008 was 69.3%.[2] Examining the cases of 176 countries between 1820 and 2013, Tomz and Wright found that on average a sovereign defaults every 140 years on external debt.[3]

The study by Eichengreen and Panizza[4] proves that avoiding bankruptcy is made difficult by the fact that neither inflation nor economic growth is supported by the current international environment. One feature of the euro area is that the domestic currency is actually foreign (and indebtedness is declining in Germany). Therefore, a very high primary surplus-to-GDP ratio should be attained to handle the situation (7.2% in Greece and 4.0% in Spain). On average, 10% of the PIIGS countries' revenues is spent on debt servicing, but this ratio is significant in the case of France, Belgium and the Netherlands as well.

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[1] *Robin Wigglesworth: Public finances: A world of debt. http://www.ft.com/intl/cms/s/2/05b14576-958f-11e4-b3a6-00144feabdc0.html#slide0*

[2] *Carmen M. Reinhart and Kenneth S. Rogoff (2010): This Time is Different: Eight Centuries of Financial Folly. Princeton University Press*

[3] *Michael Tomz and Mark L. J. Wright (2013): Empirical Research on Sovereign Debt and Default. NBER Working Paper No. 18855 http://www.nber.org/papers/w18855*

[4] *Barry Eichengreen and Ugo Panizza (2014): A Surplus of Ambition: Can Europe Rely on Large Primary Surpluses to Solve its Debt Problem? CEPR Discussion Paper 10069 http://www.cepr.org/active/publications/discussion_papers/dp.php?dpno=10069*

According to the IMF rule of thumb, the government debt-to-GDP ratio should not be (should not have been) allowed to exceed 85% in the case of developed countries (or 70% for developing ones), because above this level significant tightening reduces economic growth and adds to the debt burden, while, although the increasing of fiscal expenditures facilitates economic growth, debt also continues to increase. In Professor Rogoff's opinion, countries with strong fundamentals are at no risk of debt crisis, but weak ones fail because of the high level of indebtedness.

The article requires further consideration. Why does government debt inevitably grow? The answer lies in Schumpeter's one-hundred-year old model. An economy only grows if there is innovation in the machinery, and an idea becomes an innovation only if the banking sector creates additional purchasing power. Many researchers have measured this correlation in many ways; loan-to-GDP and loan-to-assets ratios are higher in a more developed economy. This means that the percentage growth in loans does not correspond to the growth in assets, but is several times higher. (In 1954, the ratio of debt to total assets of US manufacturing firms was only 35%, but it increased to 60% by 2000.[5]) If this pace of indebtedness had continued, corporate indebtedness would have increased to above 72% by now.

As due to bank regulation provisions the loan-to-assets ratio may not exceed 70%, economic growth would end now, because the required additional liquidity is missing. However, the increase in government debt is able to feed the necessary liquidity into the economy. (Between 2001 and 2014, the government debt-to-GDP ratio increased from 53% to above 100% in the USA.) In brief, if the rise in the loan-to-assets ratio is a precondition for economic growth, it is easy to see that – as saturation sooner or later takes place in the case of private assets – an increase in the indebtedness of the state may create the condition for the missing liquidity. If we rank some two hundred countries of the world according to per capita GDP, with a moving average the result is that indebtedness is higher in the more developed countries.

Consequently, indebtedness will increase, not decrease. It does not mean that the indebtedness of the state is always a response to the narrowing of the possibilities of corporate indebtedness, but at a given stage of development the loan absorption capacity of companies inevitably hits a ceiling, after which only the state is able to become indebted. (According to Duncan, for example, the USA should spend on research in the fields of energy and health.)

[5] *Richard A. Brealey and Stewart C. Myers (2011): Modern vállalati pénzügyek (Principles of corporate finance). Panem Kiadó (Panem Publishing Company).*

The article of the Financial Times considered economic growth and inflation as good means to overcome indebtedness. Inflation (either too low or too high) is not popular, while it is difficult to quantify the damage caused by inflation. Menu costs and shoe leather costs are not too significant compared to the extent of the fight against inflation. Mankiw's observation is that in fact the problem is not the increase in prices, but what it may entail.[6] The problem with the general price level change (both decline and increase) is that the prices of goods and services change to different degrees, and thus the dispersion of prices varies in the case of the different general price changes. Not surprisingly, price dispersion shows a V-shape function where the minimum dispersion occurs when inflation is 2–3%. Moving from it to the right or left on the number line, dispersion is greater everywhere, which means that the optimum production of the given product is possible with a combination of resources that is different than before. (It is necessary to get rid of the stored resources that have become redundant, new resources have to be obtained, and the manufacturing of the product has to be re-planned in line with the new price conditions.)

All of this also raises the issue of forming an opinion on the euro area. The single currency may also mean that Member States in distress are rescued, as in the USA. It is hard to follow the EU logic that as the federal budget is small, they do not help countries that get into trouble, but the country in trouble is deprived of its adequate means (own currency) that could help itself. The German proposal that a country should use its own currency until it is in trouble and could return to the single currency when it has recovered, was not senseless. (A known technique from the currency snake of the 1970s: each participating country tied its currency to the Deutsch Mark until the country found it useful. Some suspended it for a while, then returned to the snake. Temporary exit from the euro area may be considered an updated version of that.)

Finally, there is the issue of debt forgiveness and the reduction of debt service burdens: Over time, the EU will find the service it can request in exchange for cancelling a part of the Greek debt or reducing the debt service burdens. There is a need to step back, and a new actor needs to be involved if two actors are not sufficient for a barter. (Economics usually examines how money is able to intermediate in an exchange; now exactly the opposite is true: a new actor and a new type of service need to be involved for the intermediation of money swap.) The service provided in exchange has to be something that is important for the EU as a whole, but the latter cannot do it for some reason. It could be the far-reaching issue of defence against migration. If a refugee or migrant enters EU territory, he has different rights than in non-EU territory. A part of the territory of Greece (mainland and islands) can be defended at rational cost levels, other

[6] *Gregory N. Mankiw (2005): Makroökonómia (Macroeconomics). Osiris Kiadó (Osiris Publishing Company).*

parts cannot. (In economic terms, the exclusion of free riders, i.e. those who do not want to pay, cannot be solved rationally, because it would be too expensive or too rough.) A possible solution would be if a non-EU Member State – but a state that sympathises with the EU and is rich and/or has a high population – leased the rationally indefensible territories from the Greek state. (It would not mean selling like Russia sold Alaska or leasing for 99 years as England did with Hong Kong, but it would mean leasing for a temporary period.) The state temporarily leasing the rationally indefensible territory would expediently pay an annual fee, the amount of which would prevent the debt service burden on the Greek economy from being excessively heavy, allowing the country to return to a growth path. What could motivate the mysterious lessee state? It depends on the state. Ambitions of a North or South American, perhaps Asian or African state could be different, but there are always large and/or rich states that want something and may submit this imaginary invoice one day.

The EU and aid organisations play a significant role in the provision of migrants and refugees (including school education, adult education and the organisation of medical service). It is necessary to take into account that many of those fleeing from armed conflicts are of military age, who may consider it their duty to participate in the achievement of peace for their homeland in arms as well. It is expedient to provide military training for them and to throw them – with their consent – into battle in the disputed regions. (It can be expected of a trained and armed young Syrian to fight for peace as a member of the land forces with air support.)

In brief: the indebtedness of states is a natural consequence of the fact that in case of development the loan-to-assets ratio becomes saturated sooner or later, and thus the maintenance of liquidity becomes shifted onto government debt (expediently onto activities that serve innovation). Government debt may also become saturated if it is denominated in foreign currency. Accordingly, in the case of the EU, the possibility of a temporary exit from the euro area should be ensured for a country in distress, and a unique service to be provided in exchange should be sought. Purchasing this service would allow the repayment (de facto the write-off) of a part of the debt. At present, the service to be provided in exchange could be related to the handling of the masses of migrants (refugees). Some larger Greek islands that are a long way from the continent may become more valuable, whereas refugees who are able to fight may be expected to fight for the peace of their respective countries.

Central banks and the labour market – an alternative interpretation of the euro area crisis

Róbert Lieli – Dóra Piroska

Bob Hancké:
Unions, Central Banks, and EMU: Labour Market Institutions and Monetary Integration in Europe,
Oxford University Press, Oxford, 2013, p. 160
ISBN: 978-0-19-966209-8

Bob Hancké, Associate Professor at the London School of Economics and Visiting Professor at the Central European University (CEU), seeks an answer to the following question: did the crisis of EMU at the end of the 2000s really have its roots in a lack of fiscal discipline in southern EMU members? The researcher of comparative political economy answers with a categorical No. The reasons are deep-rooted and lie in the differences between the labour market institutions of the member states of the Economic and Monetary Union (EMU).

EMU created a fairly similar economic policy framework conditions for all of its members. The truly important difference between EMU member states is the labour market's level of organisation. In this regard, there are enormous differences between northern EMU member states – with their highly organised labour unions, formalised training components and tripartite wage negotiations – and their southern counterparts (including Ireland) where labour markets are less organised.

How did individual countries adjust to the conditions created by EMU? First of all, we need to see, argues Hancké, that under the new conditions put in place by EMU, the prospects of the export sector and the public (non-exporting) sector underwent a profound change. While the fixed exchange rate regime of the single currency forces export sector participants to adjust their wage growth to productivity growth lest they price themselves out of the international market, wage demands in the public sector are not constrained either by the reaction of

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competitors or by a potential monetary policy retaliation of the central bank. While the established system was preserved in northern countries in the 2000s and wage claims in the public sector were aligned to the possibilities of the exporting sector, wage demands in the public sectors of southern economies and Ireland escaped the constraints previously imposed by the Maastricht regime. Wage growth in the public sector, however, implied wage claims in the export sector as well, and as a result of these two effects, EMU member states saw widely diverging rates of wage growth.

How did all this lead to the 2010 EMU crisis? In his reply, Hancké stresses the importance of the real exchange rate. The real exchange rate expresses the price of the same goods and services denominated in the same currency, as perceived in different countries. In other words, a lower real exchange rate in a given country translates to a lower price level in that country. While the real exchange rate depends on numerous factors, in developed capitalist economies such as EMU member states, wages are among the most important determinants. It appears that northern EMU member states managed to keep wage growth under control through wage coordination institutions, while in southern EMU members, where the previous social arrangements had been abandoned after the adoption of the euro, wages grew unchecked. And, in a more or less closed commercial zone, a relative decline in wages (or more precisely, unit labour costs – ULC – as Hancké suggests) in a country implies that the country concerned gains a competitive advantage over those recording rising wages.

Not surprisingly, in his conclusions and recommendations Hancké proposes a higher level of labour market organisation for southern member states facing balance of payments problems. The author dismisses the notion that labour market institutions take an extremely long time to develop and can only be established in a specific historical and social environment. Citing the example of Italy in the 1990s, he asserts that efficient institutions can be put in place through top-down arrangements even under unfavourable conditions. In other words, as opposed to arguments advocating labour market liberalisation, Hancké points out that greater efficiency can be achieved through a high level of organisation.

The greatest strength of Hancké's study is that it attributes the euro crisis escalating in 2010 to a single factor: the diverging effects of the labour market and financial integration across EU Member States. This makes his analysis elegant, coherent and logical. Ironically, this is also the weakness of his paper: the author neglects or barely touches upon several factors that had a profound effect on the stability of the euro area. For example, it is hard to provide a true explanation for Greece's bankruptcy or Spain and Portugal's protracted inability to recover from the economic crisis without analysing the differences between the financial sector's level of development and processes in the financial market.

Another weakness is Hancké's excessive optimism about the feasibility of the German labour market model identified by him in southern economies. In Hancké's model, the co-movement of three factors gave rise to an economic environment that ultimately resulted in improved competitiveness. One of these factors was labour market coordination which, on the one hand, ensured the dominance of the export sector over the public sector in wage setting and, on the other hand, encouraged both labour unions and employers to achieve an increase in revenues through a more efficient organisation of labour. The second component was tight budgetary control, which did not fuel inflation through excessive public expenditure. Finally, the third factor is a restrictive monetary policy orchestrated by conservative central banks, which acted as a backstop both for labour market participants and the government.

In the final chapter of his study, Hancké claims that this level of coordination can be implemented in southern member states as well. As partly recognised by Hancké himself, the trouble is that this adopted institutional system melted away in the 2000s after the switchover to the euro and the disappearance of the external constraint provided by the Maastricht criteria. Even if we conceded that southern states – which lack the historical tradition of a grassroots neo-corporatist system – may achieve a level of coordination commensurate to the German model, Hancké's argument has a logical fault. According to Hancké, the success of the German model hinged upon the indebtedness of southern countries. In his system, the EU is a more or less closed economic system where Member States trade mainly with each other. In this system, countries adopting the German model gained competitive advantage from their ability to sell their goods to southern countries. Hancké specifically mentions that in the 2000s the direction of the flow of goods was from the north to the south, while capital flowed to the north from the south. Indeed, if southern states had not become indebted during this period, northern economies would not have been able to accumulate the balance of payments surpluses they have achieved. Therefore, although Hancké's proposed neo-corporatist coordination may somewhat improve the situation of southern economies, it fails to find a solution to the root of the problem – i.e. the lack of a common fiscal power in Europe that is capable of offsetting regional imbalances with financial and other transfers.

Euro Crash – How Asset Price Inflation Destroys the Wealth of Nations

Norbert Szijártó

Brendan Brown:
Euro Crash – How Asset Price Inflation Destroys the Wealth of Nations
Palgrave Macmillan, 2014, p. 275
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The book discusses the financial crisis of 2007–2008 from the angle of asset price inflation, and shows that the monetary policy flaws of the Fed, the European Central Bank and even the central banks of emerging countries (especially China) contributed to the meltdown. Largely ignoring developments in the US economy, Brendan Brown's main focus is on the European economy, in particular, the series of policy mistakes by the European Central Bank (ECB). The author arrives at his conclusions drawing on his practical financial expertise and the monetary policy approach of the Austrian School of Economic Thought. He argues that the ECB made a series of blunders under the presidency of Jean-Claude Trichet, while his successor, Mario Draghi, played an important role in preventing the deepening of the sovereign euro area crisis with the political support of Angela Merkel. At the end of the book, Brown describes the functioning of a deeper monetary integration as a possible way to seize the opportunities presented by the crisis generated by the Federal Reserve (the bursting of the asset price bubble).

The book begins with a basic question: Why did the European Monetary Union suffer an existential crisis soon after its creation? According to the German view, everything would have been fine if it had not been for certain Member States contriving to circumvent the strict fiscal rules stipulated in the Stability and Growth Pact. By contrast, the Paris and Brussels view attributes the crisis to a failure of the EU Treaty to provide for a framework of fiscal, debt and banking union. In Brown's opinion, it is mainly the flawed structure of the EMU that should be held responsible for the crisis and the near break-up of the euro area that followed; the architects of the EMU failed to build a structure that would withstand the external or internal forces driving monetary instability.

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The Economic and Monetary Union suffered a virus attack of asset price inflation. Although the virus can be traced back to its original source, the Federal Reserve System of the USA (Fed), the European Central Bank's (ECB) monetary policy (or rather, deficiencies thereof) exacerbated the effects of the attack. When asset price inflation progressed into deflation, the European political elite could no longer deny the damages sustained by the European Union. They refused to accept monetary explanations even amid the new wave of asset price inflation set in motion by Fed chairman Ben Bernanke. The extended period of quantitative easing launched by the Fed, as well as the Fed's long-term interest rate manipulations (2011–2012) gave rise to such a speculative fever that culminated in the purchases of European sovereign and bank debt. The growing interest in sovereign and bank securities bought some time for the euro area in its existential crisis. According to the author, Germany's agreement to the bailout of weak euro area Member States reflected the fact that the German export machine was successful in selling its products to emerging economies that temporarily benefited from the speculative fever originating in the Fed's series of quantitative easing measures. The tolerance of German taxpayers for sovereign bailout programmes (and Angela Merkel) will only last until the asset price deflation morphs into inflation once again.

In the first chapter of the book, Brown describes an intriguing phenomenon related to the asset price inflation: the complete denial of early leading monetarist economists about its existence. Neither Friedman and Schwartz, nor Meltzer mentions the phenomenon in their famous studies. It is particularly interesting in Friedman's case, as he taught and conducted research on the same campus as Hayek who, as early as the 1920s, set out to examine which monetary policy steps of the Federal Reserve Bank of New York had led to asset price inflation. One explanation may be the fact that, on the one hand, it is difficult to fit asset price inflation into the approach of positive economics represented by Friedman. On the other hand, the measurement and empirical testing of speculative fever are also challenging tasks. It is a basic hypothesis of the Austrian School of Economic Thought that monetary disequilibrium causes asset markets to display excessively high relative prices, the repercussions of which include mal-investment and a long-term erosion of the risk appetite essential to the functioning of capitalist market economies.[1] The writers of the Maastricht Treaty were not aware of the phenomenon of asset price inflation, and the central bankers devising the uniform monetary policy merely considered the price of goods and services as a measure of inflation.

When asset price inflation attacks the economic system, various forms of irrational exuberance emerge. Irrational exuberance is a state where investors tend to assign

[1] According to Brown, "mal-investment means capital spending that would not have occurred if price-signalling had been undistorted". And the distortion is caused by the speculative fever itself.

a lower probability to negative outcomes, and an excessively high probability to positive future scenarios. The question is how this process is facilitated by monetary disequilibrium. The author offers three possible answers to this question:

i. Under monetary disequilibrium, the manipulation of medium and long-term interest rates far below the neutral level generates excessive capital market demand;

ii. A long period of low interest rates – even if in line with neutral – may trigger "yield desperation" fuelled by investors' search for higher-yield investment instruments;

iii. Fear of high future inflation may stimulate excessive investment in certain assets in the present, and this process may eventually become irrational.

Both types of inflation (asset price inflation and goods inflation) are hard to recognise at an early stage; indeed, reliable statistical approaches do not even help. Brown stresses that major central banks and the central banks of currency areas have a key role (asymmetric power) in the generation of asset price inflation. He brings up the Fed's role as an example: if the Fed manipulates long-term interest rates downward, it will stimulate investors to assume a degree of irrationality across the entire US dollar zone in their search for higher yields. After the emergence of asset price inflation only one question remains: how will the asset price bubble burst? The end of asset price inflation generally signals economic dislocation for a certain period of time. Due to its unpredictability, the virus usually runs its course without monetary policy intervention; monetary policy intervention only takes place at a time when the asset price deflation is already unavoidable.

The second part of the book is dedicated to the current problems faced by the euro area, drawing on the conclusions of the aborted attempt at a Franco-German dollar union. De Gaulle and Adenauer could have agreed on a monetary union between France and Germany, with both countries participating in the dollar standard within the framework of the Bretton Woods monetary system at the time. The Deutsch mark and the French franc would have become fully convertible to each other, and any fluctuations against the US dollar could have been managed (in order to keep the currency within the permitted fluctuation band) through adjustments to the monetary base. Instead, a generation of French politicians invested an enormous amount of effort to end the monetary hegemony of Germany until they eventually established the Economic and Monetary Union with the European Central Bank. The ECB can only function within the framework of certain rules; however, the single monetary policy cannot resolve the economic problems of each individual Member State, especially in periphery countries. Instead of a single monetary

policy and the reform of the ECB, in line with German expectations, they confined sovereigns within counterproductive, long-term, strict fiscal rules.[2]

The next question Brendan Brown poses in his book is how the virus of asset price inflation infected the euro area. Numerous experts, politicians and journalists strived to identify the reason behind the deepening of the euro area crisis, generally exploring the following topics: global lending bubble in the mid-2000s and its burst, the flaws of monetary policy doctrines, regulatory regimes, the system of financial intermediation which systemically underestimated risks and maintained questionable remuneration standards, and the pricing deficiencies of capital markets. The culprits included prominent central bank actors (Alan Greenspan and Ben Bernanke) and collective entities, such as China (due to its exchange rate policy), the excessive savings rates of Eastern Asian households and corporations, regulators, such as the US Securities and Exchange Commission or the Bank for International Settlements, as well as European central banks or quite simply, the United States.

The central bank of the euro area had a faulty monetary framework and a deficient mandate from the start. Brown cites the monetary policy objectives enshrined in Article 105 of the Maastricht Treaty, pursuant to which the primary objective of the European System of Central Banks is to maintain price stability. Over the long run, price stability and monetary stability are partially overlapping concepts, but the goal of monetary stability should nevertheless have been included in the Treaty.[3] In developing the monetary policy of the ECB, the Issing Committee could have chosen from numerous alternatives, including Anglo-Saxon monetarist traditions of even the Austrian School of Economic Thought. The monetary targeting of the ECB – i.e. in the medium term the average value of the harmonised consumer price index may not exceed 2 percent – jeopardised the monetary union three times in its first decade, generating severe imbalances in all three cases.[4] In this chapter the author explores additional problems as well: first and foremost, the ECB had no scenario for emergencies; in other words, it did not have any contingency plans for a deep economic recession or a financial panic. Secondly, the ECB has been widely criticised for the excessive role of German-oriented aspects in the conduct of monetary policy exceeding the economic weight of Germany. Thirdly, the ECB failed to detect the spread of the monetary disequilibrium generated by the launch of the euro, despite the increasingly overheated financial markets. And

[2] It should be added that, following the Fed's example, the ECB took numerous unconventional, albeit belated, monetary policy steps, some of which are not covered by the ECB's mandate.

[3] Monetary stability is a state when money does not become the source of severe disequilibrium in the economy.

[4] First occasion: between 1994 Q4 and 1999; second occasion: between 2003 and 2005/2006; third occasion: between 2007 H2 and 2008 Q3.

finally, again and again, the ECB underestimated the effects of the US economy on Europe, especially at the time of the recession in the United States.

Similar processes – monetary policy steps – led to the bursting of the European asset price bubble as to the Great Depression of 1929. Brown puts the blame on US and European policymakers and on emerging markets – especially China – for failing to do everything in their power to ensure the convertibility of the yuan. The measures of the ECB could not be effective as they did not recognise the true nature of the crisis; instead, the events were misdiagnosed as a liquidity crisis. Had it been a liquidity crisis, the liquidity injected by the ECB would have restored the imbalances on interbank markets within a matter of days, and the ECB could have withdrawn its support. In several cases, the central bank of the euro area provided far more liquidity than needed, thereby creating a transfer union. As to why this had happened, the author offers several answers. First and foremost, policymakers should have reformed the monetary policy strategy of the ECB, setting a quantitative target for the monetary base; however, evidently, this is not possible in the midst of a crisis. Secondly, by reducing interbank interest rates to zero the ECB could have forced commercial banks to invest their funds in short-term government securities rather than keeping their reserves risk-free at the ECB. Thirdly, the ECB relied too heavily on its methodological (econometric) model at a time when it could not provide any insights with respect to monetary and financial developments. Finally, the ECB should have assumed the role of lender of last resort.

Moreover, the ECB overestimated the role of temporary and short-term effects in measuring and forecasting inflation, while it was not prepared for the phasing out of the unconventional monetary policy steps adopted during the crisis. The European insolvency crisis, in turn, deepened in 2008, which led to a situation where sovereigns were forced to bail out banks teetering on the edge of bankruptcy. This put sovereigns themselves into jeopardy far before Greece became the focus of attention. Analysing the speeches of ECB presidents, Brown concludes that none of them took responsibility for any mistakes in managing the crisis, even at a time when they failed to launch a quantitative easing programme in parallel with the rest of the central banks.

In the seventh chapter, the author points out that the sovereign crisis of the euro area unfolding in the midst of the asset price inflation engendered by the Fed has become, despite the flaws of the ECB's steps, a driver of integration, giving new momentum to Europe. Brown alludes to the Draghi–Merkel duo. In the autumn of 2011 Mario Draghi and Jean-Claude Trichet negotiated together with the Fed chief and the US Finance Minister about a substantial dollar swap facility, which enabled the ECB to launch two long-term refinancing operations (LTROs). In the author's opinion, from the side of politics, Angela Merkel supported Mario

Draghi's unconventional monetary policy steps with the implementation of outright monetary transactions (OMT) at the core. This meant that, under suitable conditions, the ECB was capable of providing completely efficient support to distressed euro area Member States.

In the final chapter of its book, instead of summing up his conclusions, Brendan Brown outlines his vision for the Economic and Monetary Union. He presents a new monetary union to be established by the Paris–Berlin axis. Although there has been some speculation about such a plan in the press, any specific intention (a finalised scenario) would give rise to grave problems: on the one hand, it would generate strong tensions among the central bank leaders and finance ministers of the euro area countries, and, on the other hand, it would trigger yet another wave of the speculative attacks from financial markets. Instead, a new monetary union could be established within the euro area which, drawing the lessons from the failures of the Maastricht-based monetary union, would have a far more stable architecture than the existing EMU.

Hungary in the changing world

Eszter Mikó

Mihály Patai – László Parragh – Csaba Lentner:
Hungary in the changing world
Éghajlat Könyvkiadó Kft. Budapest, 2015, p. 330
ISBN: 978-963-9862-76-0

After the political transition, a new chapter has started in the history of Hungary. The economy and the society of the country have undergone an enormous transition and in the meantime the world surrounding Hungary has also been transformed. This book discusses the peculiarities of the past 25 years through conversations with the three authors. The book presents the authors' own experiences and opinions on the events of the given period. The authors are Dr Mihály Patai, President of the Hungarian Banking Association, and Chairman and CEO of UniCredit Bank Hungary Zrt., Dr László Parragh, President of the Hungarian Chamber of Commerce and Industry, and Dr Csaba Lentner, Professor and Head of the Department of Public Finances at the National University of Public Service.

The first part of the book, published by Éghajlat Könyvkiadó and comprising of eight chapters, analyses the major economic and social problems of the past twenty-five years that affected Hungary, while the second structural unit contains the interviews with the authors.

One of the areas in the focus of the authors is the period after the political transition of Hungary, analysing how the external and internal socio-economic changes impacted the situation of Hungary and its perception abroad. They also touch on the global economic crisis that followed the shock caused by accession to the European Union and the political transition, as well as the problems arising from foreign currency lending. They analyse the economic impact that may have been generated by the lack of accession to the euro area. They discuss at the probable future directions, and survey the changes that would be necessary for economic growth in Hungary, in particular by reforming the higher education and consolidating the Hungarian corporate sector.

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Chapter one presents the key economic and political events of the political transition, as well as the socio-economic situation of Hungary in the early 1990s. At the time of the political transition, Hungary struggled with large government debt and the national capital stock available for investments was extremely low. The engineering and technical level of the plants and enterprises significantly lagged behind that of the developed (western) states. After the political transition, Hungary opened up to foreign capital and significant investments were implemented within a short time. At that time Hungary was the champion in the Central and Eastern European region in attracting foreign capital. In 1997, the capital inflow to Hungary was as high as USD 1.5-2 billion (*Diczházi 1997*), while foreign investment until 2003 amounted to almost USD 43 billion, 50 per cent of which focused on industry. Direct investments and transnational enterprises were instrumental in the economic renaissance of the Central and Eastern European countries and their integration in the global economy. FDI also participated in privatisation. Foreign investors often purchased market only, as a result of which the modernisation and improvement of the majority of the sold plants did not materialise and they were shortly closed down. One of the privatisation objectives of the government, namely to develop the national enterprises, failed to materialise. The impacts of this can be still felt; these include declining output in certain economic areas, or even the full termination of production, primarily in heavy industry, textile industry, mining and quarrying and the sugar industry; however, it should be noted that these areas were on the wane since the 1970s in the developed countries as well.

As also reflected by HCSO figures, sugar manufacturing was not liquidated, but only one – in Kaposvár – was left out of the previous twelve factories. Sugar manufacturing was downsized by 2007, while bus manufacturing stopped in 2009, albeit later on it restarted periodically. On the other hand, there was a huge decline in cotton fabric manufacturing and coal mining. Nevertheless, these industries did not disappear completely. On the contrary, according to the latest data, although in 2011 and 2012 the output of the cotton fabric industry was only 2 million m^2 – most probably due to the crisis – this figure in 2013 was as high as 12 million m^2.

The authors mutually agree that foreign direct investment was essential for the Hungarian economy at the time of the political transition. With the multinational enterprises, the Hungarian economy realised profits never seen before and that would have not been possible without them. Until the political transition the enterprises in Hungary were owned by the Hungarian state. As a result of the privatisation and the settlement of the multinational enterprises, the ownership structure of the enterprises had undergone a considerable transformation by 1997. In 1990 there were 5,462 enterprises in Hungary with joint Hungarian and foreign ownership, or fully foreign ownership interest, while in 1997 this number reached 25,706 (HCSO). 12,729 of the enterprises in foreign ownership operated in the commercial, road vehicle and consumer goods repair sectors, 4,276 in

manufacturing and 4,107 in the real estate and letting business, and support services for economic activity.

The experts also point out that the political transition and the privatisation was a turning point not only for the enterprises and the economy, but also for Hungarian society. After 1989, as a result of factory shutdowns and the liquidation of the cooperative societies, unemployment suddenly appeared, which was a completely new phenomenon compared to the former full employment. In the early 1990s, suddenly many thousands of employees were fired. In order to avoid unemployment, people retired in large numbers or opted for some kind of pension-type benefit, while young people prolonged their studies in the hope of better chances for employment. All of this was a huge burden on the Hungarian economy. While the unemployment rate in 1992 was merely 9.9 per cent, by 1995 it had risen to 10.3 per cent. The employment rate fell from 52.5 per cent to 46.7 per cent, while the labour force participation rate decreased from 58.3 per cent to 52 per cent. However, these figures conceal regional differences both in the area of unemployment and economic activity. Huge inequalities started to develop between the various regions of the country. The unemployment rate in Pest county in 1997 was 6.6 per cent, whereas it was 15.3 per cent in Borsod-Abaúj-Zemplén county. The majority of the companies in foreign ownership interest settled in the Central Hungary and the North Transdanubia region, thereby adding to the regional inequalities. These regional difference still persist today (*Kiss 2007*) According to the official statistical figures in 1997 Pest county had 1,626, while Nógrád county had merely 147 companies in foreign ownership interest. As a result of unemployment, the decline in economic activity and the shutdown of companies and cooperative societies, Hungary's GDP decreased between 1989 and 1994, followed by a slow upward drift.

Due to the changes that took place in the early 1990s, the downsizing of part of the economy, the spread of unemployment, the rise in regional differences, impoverishment and deteriorating living conditions, the society lost faith in the Western path. According to the authors, the economic crisis of 2008 recalled or perhaps even increased this disappointment. Thus, the society is in a kind of "permanent" crisis.

The authors are of the opinion that the economic crisis in 2008 was attributable to the overflow of the markets and the banks; by the 2000s the companies were unable to sell more products, while banks could not lend more; accordingly, the growth rate of the profit declined. First in North America, and then in an increasing number of countries, loans were granted also to non-creditworthy borrowers. Later, these loans defaulted in large numbers. Banks concealed these losses for a while by securitisation and the outsourcing of defaulted credit claims to workout companies, but by 2008 the situation has become unsustainable. Several large

banks went bankrupt, loans became expensive and credit channels dried up, and the crisis of the banking system evolved into an economic crisis. Hungary was hit hard by the crisis, because the foreign-owned banks transferred the repaid loans to their home countries to cover the costs and losses of their parent banks rather than reinvesting it Hungary; however, as the authors point out, no stones should be cast at the foreign banks for this. It should be clear for all that both the households and the enterprises need loans; the problem was not the fact of the lending, but the degree and the proportions.

An additional problem that rose during the crisis was that the regulatory and control authorities failed to monitor and audit these processes efficiently enough. The authors believe that the greatest mistake committed by the Hungarian society was that it had no savings. The common attitude inherited from the previous regime, namely that the "state will solve all problems", still persists in the society.

The authors of the book are of the opinion that the crisis was preceded by several events which exacerbated the consequences. The crisis hit Hungary amidst poor economic circumstances; for example the degree of government debt was very high. According to the figures provided by GKI Gazdaságkutató Zrt. government debt in 1989 was 73 per cent of the GDP, which rose to 80 per cent in the period of 2008-2010, which is a huge burden.

The resolution of the first massive crisis after the political transition was a huge challenge for the government then in office. It applied a variety of measures and instruments to address the unfavourable situation as smoothly as possible. One of the government's crisis management measure was to make people work. It introduced the fostered workers programme to assist the unemployed. The authors believe that in this area the next important step would be to achieve that the Ministry of the Interior should cease to be the largest employer, as is now the case with the fostered worker programmes; the objective is to direct fostered workers back into the private sector.

In addition, the reform of higher education, healthcare and research and development (R&D) is essential for achieving sustainable growth. Reforms in higher education are needed, because the capacity of the Hungarian universities today is 550,000 students, but only 320,000 – indeed, in 2014 only 307,000 – students studied in higher education. To make things worse, a further decrease may be expected due to the population decline and the increasing number of those enrolling to foreign institutions. The realistic objective should be to adjust the capacity to the real demands and ensure full utilisation of the higher education capacities. One of the problems of the reform of higher education is that if a town is left without a higher education institution, the town will start to plummet, thereby taking an unfavourable direction in socio-economic terms, as part of the youth and the intellectuals will leave. It is important to ensure that only such fields and

professions are taught that are needed by the market. László Parragh points out that the economy, education, R&D and the use of additional funding must work together for Hungary to achieve a considerable economic growth in the future.

The experts deem it indispensable for Hungary to have a broad corporate sector built on domestic capital. Sustainable growth requires a strong middle-class, which should be fostered by the state by appropriate measures. Another step to achieve economic growth is the expansion of the market in the east, meanwhile preserving the existing western markets. It is also important to sustain a balanced central budget. Although the deficit is below 3 per cent at present as well, efforts should be made to reduce it further in the future.

Csaba Lentner emphasised that it is essential to support the income growth of the Hungarian families, which requires the decrease of taxes and an increase in social benefits. Personal income tax should be reduced to below 10 per cent, while it is justified to decrease the VAT rate of 27 per cent to the European average. He also deemed it important to reorganise the fostered worker programme in the future.

Taken together, the reader gets a view of Hungary's position in the changing world in the interpretation of three experts coming from different fields, but essentially taking similar positions. All of this is available in an easy-to-understand, readable form, with plenty of summarising and analytical information. The discussions help us see and understand Hungary's development in the last 25 years and its economic situation from a complex, unbiased approach.

I recommend this book to all readers interested in finding out what three acknowledged experts think about the economic, social and political changes of the past 25 years, the experiences they gained, their opinion on how to make the Hungarian economy prosper and the important changes needed in the future to achieve sustainable economic growth.

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Genocide in Africa: Inertia or Indifference

Ádám Éva

Zsuzsánna Biedermann:
Genocide and destabilisation in the African Great Lakes Region
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The focal points of the author's analysis are three countries of the African Great Lakes Region: Burundi, Rwanda and the Democratic Republic of Congo. The national governments established after independence engaged in a campaign of ethnic cleansing that lasted for decades. In the medium and long term, this undoubtedly improved regime security and engendered personal economic successes and as such, it proved to be a rewarding undertaking from a political economy perspective. At the same time, the international community has ratified treaties undertaking to prevent all forms of genocide since World War II. By reviewing the economic motives at play, the author wishes to contribute to improving the efficiency of the methods of prevention.

Biedermann calls attention to the unsuccessful application of the Genocide Convention adopted in 1948.[1] Under the Convention, genocide is a crime against humanity committed with specific intent (*dolus specialis*) to destroy, in whole or in part, a national, ethnic, racial or religious group. In addition to the substantive and conceptual shortcomings in the Convention, the main problem is that intervention should be the adequate step taken once signs of genocide have been detected. Typically, however, the international community fails to take action until after the fact (Nurnberg trials, the ICTY and the ICTR ad hoc tribunals).

The chain of events in these three African countries between the 1960s and the 2000s demonstrated that the international community did nothing to prevent or halt the massacres even though it had up-to-date information all along. The United Nations proved to be impotent, and it was not in the United States' interest to intervene. Colonial powers, likewise, had no interest in eliminating their local clientele.

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[1] Convention on the Prevention and Punishment of the Crime of Genocide

The author primarily focuses on the post-colonial conflicts between the Hutu – a part of the population traditionally engaged in farming – and the Tutsi – the wealthy echelon of society that typically raised and herded cattle. The spiral of violence was set in motion by the 1972 genocide in Burundi, an event that has never been acknowledged officially. The massacre, which left 200,000 victims in its wake, was fairly unexpected in a seemingly stable social structure where ethnic diversity was traditionally accepted, there were no religious disparities, and movement within or between the layers of social stratification was free and unobstructed in both directions. In point of fact, however, the root of the tensions lies in the deeply ingrained Belgian administration and the preservation of the colonial economic system.

The ethnic discrimination introduced by the Belgian colonial administration rendered social mobility impossible. While the pre-colonial "subsistence economy" maximised economic benefits for all ethnicities, the extraneous economic sectors imposed by the colonisers (coffee and tea production) benefited none of the ethnic groups; instead, they put a new Tutsi political elite into power whose main ambition was to maximise grants. In Rwanda, the Tutsi supremacy was toppled by the 1959–1961 Hutu revolution, heightening animosities between the two ethnicities. Mounting tensions boiled over in April 1994 in Rwanda when 500,000 people, mainly Tutsi, fell victim to genocide within the span of 100 days. Eventually, the Tutsi RPF took over Rwanda, followed by a massive exodus of refugees heading to Congo, including the Hutu *génocidaire* that participated in the massacres.

The economic meltdown that led to the genocides took place as follows. Amid soaring global coffee and tea prices, the government granted extraordinary subsidies to producers in the 1970s and 1980s in order to stimulate production, and bought up crops at inflated prices. By the beginning of the 1990s, however, plummeting world prices rendered the level of state subsidies unsustainable. Explosive population growth and the lack of resources intensified ethnic tensions, triggering a string of daily atrocities.

In East Congo, the influx of refugees in the wake of the genocides directly aggravated the ethnic unease between natives and Rwandan refugees in the second half of the 1990s (in North and South Kivu). Guerrillas used the refugee camps to launch regular attacks against the government of their home country which, in turn, ultimately retaliated with the massacre of refugees. Taking advantage of the rich mineral resources of the area (tin, tantalum, wolfram) contributed to the wars for "self-preservation" in the region. To this day, the mineral resources to which Congo is entitled are transported and sold by Rwanda as its own property, free of customs and tax.

Ruling Rwanda since 1994, Tutsi President Paul Kagame has maintained his legitimacy in the eye of the international community by pledging to abolish ethnic discrimination and citing the constant threat of genocide. Kagame runs a "patrimonial developmental state", which implies a fair and more broad-based allocation of grants and could guarantee the preservation of the regime far into the future.

The dilemma that emerges by the end of the author's analysis stems from the fact that, while genocide proved to be a "lucrative" venture for the authoritarian regimes of the African Great Lakes Region, as in the past, the international community will remain reluctant to intervene in the internal affairs of any country in the region. At the same time, infrastructure developments across the region, technological developments and the formation of economic alliances could be an even more rewarding enterprise both for the countries concerned and the international community.

Key concepts of the philosophy of Mohandas Karamchand Gandhi

Norbert Varga

Dezső Szenkovics:
Key concepts of the philosophy of Mohandas Karamchand Gandhi.
Pro Philosophia Kiadó, Egyetemi Műhely Kiadó, Cluj-Napoca, p. 225
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In recent decades, the religious and cultural trends of the Indian subcontinent have continuously appeared in Central Eastern Europe arousing broad public interest. Numerous civil society organizations with Indian spirituality were registered, various churches opened their gates and yoga schools became available to improve the quality of life. As a result of globalization, synchretism became a quasi self-evident trend, and thus it is no wonder that an Indian topic generates scientific interest in Central Eastern Europe. Moreover, due to technological development, "spatial contractions" occurred in the pulsating world: answering social, and in particular economic and political questions without some kind of a universal knowledge base and only relying on the experiences of our own geographical and cultural region is virtually impossible. A simple example can illustrate this well: Zoltán László, a trade union officer caused some amusement among the rows of his audience at his presentation, when he told about the intercultural gap widening between the management of the Indian-owned car parts producer Samvardhana Motherson Reflectec (SMR) and the Hungarian party when launching the producer's plant in Mosonmagyaróvár. On the one side, measures that seemed inconceivable for the rational European eye were taken when the sacral "energy barrier" was created to compensate for the inadequate location of the plant or when furniture was arranged. The Indian owners were at least as shocked when their Hungarian counterparts served them a grey beef speciality with the best intentions.

Even if we accept the importance of intercultural dialogue, we have to stop for a moment before examining the professional-academic focus of this work and ask the question: do we really need another academic experiment, with such ample literature on Gandhi?[2]

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The answer is clearly yes. To prove that the answer is not simple axiomatic, one need merely read the following review of the work by Dezső Szenkovics. It is worth discussing the author himself for a moment. In consideration of the "sine ira et studio" maxim by Tacitus, the author of a review must apply the principle of impartiality in his paper with double emphasis, owing to his friendship with Szenkovics and his deepest respect for Gandhi.

As a background, it should be noted that, thanks to the particular attention paid to the life of Sándor Kőrösi Csoma, which is more typical in Transylvania than in Hungary, Szenkovics – a Hungarian academic from Romania – arrived India in the 1990s for the first time for some weeks, following the route of the renowned Hungarian orientalist.

His personal account tells that right at the moment of his arrival to the subcontinent, he was faced with a country image campaign that offered two extreme alternatives regarding the attitude towards India: "love it or leave it". His decisions led to his everlasting bonding to India, its culture and spiritual heritage/creators. Among the creators, the personality of Mahatma (Tagore gave him this attribute, which later formed into a name) particularly caught his interest. All this is attested in his innumerable presentations and publications, as well as the publication and supervision of Gandhi's major work "*Hind Swaraj or Indian Home Rule*" (in Hungarian "*Hind Szvarádzs, avagy az indiai önkormányzat*" (Kriterion Könyvkiadó, Cluj-Napoca, 2010)). This academic background led Szenkovics to author his own book (which in turn earned him a doctoral title). The question might arise: why doesn't it cause dissonance in an author with a Protestant cultural background to find a model in Hindu morality? Perhaps, the review indirectly answers this question, too.

When reading the book, it is clear that it has a logical structure: we wander from one topic to another, from a person through Indian social history to the interpretation of the key concepts of the Great Teacher, as a well-constructed spiritual path, which is much more than an exegesis or a set of semantic distinctions. The greatest merit of the work is that it synthesises and comparatively presents the relevant Gandhianistic literary without concealing works having a critical tone of Mahatma. The way the sequence of events essential for the topic is not a notorious reiteration of India's social history as written many times before, but form an integral part of the epistemological foundation of the book. Naturally, Kant's *priori* concepts (space and time) define political actions, however, it seems that Gandhi's ideas of social philosophy blast these frameworks into pieces. In the spirit of the "historia est magistra vitae", a thinker of the 21st century Europe has to pay distinguished attention to these parts, since the Indian subcontinent had to face challenges such as poverty, cultural diversity, unemployment, a counter-productive educational system, corruption, inertia across the bureaucracy, a structure that strangles

small and medium-sized entrepreneurs, the impact of multinational economic operators, etc.

One cannot ignore the fact that the Indian subcontinent is considered the birthplace of several world religions. The philosophical literature of these religions unfolds a theoretical activity that had an effect on the definition of optimal political and economic structure for millennia. The unique theoretical bases have complementary theories attached to them, to a great extent as a result of the eastward expansion of Western European powers. However, the western Christian universe and the ideology of enlightenment could be nest into the world of the Indian caste-system, and mainly only affected a narrow collaborating elite with British (re-)education. The "isms" of the west in the 19th century (liberalism, conservatism, communism/socialism, nationalism) only reached the subcontinent with considerable delays. The colonisers established intermediary institutions in vain, they failed to achieve anything beyond "cultural mimicry", since the lack of receptive ability prevented total identification with the theories of western civilization. The constitutional structure of India after it gained independence in 1947 follows the pattern of Western European democracies in procedural terms, but in a substantive comparison it still differs from the model system. It is unquestionable that the Indian subcontinent and Western Europe do not belong to the same framework of civilization, which means an irresolvable structural difference.

The essence of the book is the analysis of key concepts in Gandhi's philosophical concepts (social, religious and political). It is important to point out that the groundwork of Gandhi's social thinking are of religious nature virtually in their entirety (justice – satya; nonviolence – ahimsa, devotion to the truth – satyagraha). However, it is not the central role of a single religion (in this case Hindu with its Vaishnava branch Gandhi was affiliated with) that the author dwells on and calls our attention to. Instead of the dogmatic interpretations of religions, Gandhi focused on their essence. This is how he found coinciding conceptual frameworks in the teachings of Hinduism, Jainism, Buddhism and Jesus Christ, and used them after selecting, adapting and modifying them. Through this recontextualising-reinterpreting experiment by Gandhi, conceptual entities were extended with new semantic contents and embedded into new sets of correlations, which resulted in a new political and economic pattern as well. This all happened while the contents construed by Gandhi became available for decoding for all segments of the social-political-economic field, and hence could be introduced into public thinking.

Gandhi is a meta-historic philosopher; however, it is true that his ideas related to the political events of a given political time and space, but his compass points to the direction of the absolute objective. Gandhi can implement a *sui generis* change of paradigm, because he takes on theo-political attributes. What Gandhi does,

goes beyond politics: his political thinking bears universal features. His ideology does not restrict itself to actions bound to particular situations, the content and meaning of his teaching cannot only be interpreted in the specific context, but eruptively speaks to everyone, regardless of time and space. This does not mean that Gandhi disregarded periods of world history; on the contrary, his receptors perfectly signalled him the changes in economy and political history that seemed irreversible.

The central point of Gandhi's ideology is the concept of justice that goes beyond any megalomania of our world. This results in a paradigm that bursts others in the same a priori time and space structure, that is, the Justice postulated by Gandhi allows the existence of parallel paradigms. Since however, the relation and communication between them remains unencoded, diverse paths of development occur in the paradigmatic interpretation of dominant economic and political relations. The reason of antinomy can be found in the base formulas of interpretation. While the political notion of the British is guided by the Machiavellian principle (with a consequential impact on the arrangement of social reality), the means and aims of action for Gandhi are in harmony, they are directed towards Justice. This is the root of the irreconcilable conflict between the British and the Gandhian opinion. While, notwithstanding the spiritual heritage and life of Thomas More, the leaders of Great Britain deemed inconceivable the fact that politics could be motivated by religious-moral views, Gandhi saw politics as "applied religion" (*Szenkovics 2014:102*). By the middle of the 20th century, the asymmetric political and economic relations between India and Great Britain became unsustainable, since the dominant party only viewed India from a special demand and supply relationship: practically it exploited it. No wonder that Gandhi had strong criticism for the West, since its economic and political solutions were in direct opposition to the theses and antitheses of Jesus Christ's Sermon on the Mount.

In consideration of the level of development and the general conditions in India at Gandhi's time, it might be interesting to read and interpret Szenkovics' book by putting Thomas More's *Utopia* (Cartaphilus Könyvkiadó, 2011) in parallel, which gives a judgment of the capital production and social conditions of contemporary England (first decade of the 16th century). The three problems I have arbitrarily selected underline the similarities:

i. The situation of insecure social groups:

Ruining the agricultural workers and small and medium-sized entrepreneurs as regards food production and light industry in More's time: 'The increase of pasture,' said I, 'by which your sheep, which are naturally mild, and easily kept in order, may be said now to devour men and unpeople, not only villages, but

towns... The price of wool is also so risen that the poor people, who were wont to make cloth, are no more able to buy it; and this, likewise, makes many of them idle.' (*More 2011:26-29*) In Gandhi's time: 'the flatlands of India were all white with the bones of wool-weavers' (*Szenkovics 2014:47*).

ii. The Oikos-type subsistence:

The subsistence of the utopistic *Nowhere* island: 'Every family makes their own clothes ... and throughout the island they wear the same sort of clothes.' (*More 2011:68*) In Gandhi's time: 'A constructive programme was also designed that symbol of it being domestic spinning and weaving, which after all stressed the highest level of subsistence of micro-communities.' (*Szenkovics 2014:77*).

iii. Recruitment of leaders:

More's '*politeia*' (meritocracy) programme: 'Out of these [learned men] they choose their ambassadors, their priests, their Tranibors, and the Prince himself, anciently called their Barzenes, but is called of late their Ademus.' (*More 2011:72*) Gandhi's gnostic theory: '...those who have not only sworn an oath to practice the ahimsa, but also went through a comprehensive spiritual and moral education... Since only in possession of knowledge, learning and intellectual skills is it possible to prevent that the ahimsa from becoming a "fixed and spiritless dogma" for them...' (*Szenkovics 2014:147–148*).

The examples could go on much longer. Although the scope of this review does not allow for a detailed analysis, the parallel examination of these two book can without doubt shed light on new sets of correlations, and bring the reader to a more complex understanding.

In the closing sections of his book, Szenkovics emphasises the relevance of Gandhian principles, and then draws conclusions. Perhaps, the message of the whole book is given the following teaching of Bapu, which might sound quite familiar to Hungarian society with strong Christian roots: "*abhaya*", that is, lack of fear. This is made even stronger by the programme of absolute transparency that covers the perfect harmony of the thought, the word uttered and the action. In light of the above, Gandhi's teaching can potentially be the antithesis of postulates in Samuel P. Huntington's "*The Clash of Civilizations and the Remaking of World Order*" (Simon & Schuster, 1996) in the constellation of the values proclaimed by Hinduism and world religions (Jewish-Christian, Islam, Hinduism). The reviewer has a sense of something missed in one aspect only: it would have been interesting to compare Gandhi with the Quran, since the greatest failure of Mahatma's life was the inability to reach a compromise with the Muslim League and its leader Muhammad Ali Jinnah that eventually led to the fragmentation into a "multi-regional" India.

Although Gandhi knew well that the "*sarvodaya*" (new moral and welfare society) is very difficult to realise, still he worked enthusiastically and unswervingly to accomplish it – just as the author of this volume desires for a more moral present and future. This work is clearly an ars poetica and creed for Szenkovics, who may have faith in a spillover effect, i.e. that his book will gradually shift from the academic realm to all areas of life. As Gandhi could not conceive how a religious man could refrain from political and economic challenges, the author is likewise a real "homo politicus". And the message is addressed to everyone who think that either the Hindu ideology or the values of the Bible have validity in our present, or possibly accept Kant's categorical imperative as reality.

Future of the banking sector in the Central and Eastern European region – Report on the joint conference of the Hungarian Economic Association and the Magyar Nemzeti Bank

Tamás Rózsás

On 30 September 2015, the Hungarian Economic Association and the Magyar Nemzeti Bank held the first of what is intended to become a series of joint conferences on the future and the prospects of Central and Eastern European banking sectors. At this prestigious professional event, governors and deputy governors of the region's central banks and leaders of Hungarian commercial banks shared their views on the development, future, challenges and tasks of the banking sector, and proposed strategies with which the sector can meet the challenges of our times and prepare for those expected for the future.

The conference was opened by György Matolcsy, Governor of the Magyar Nemzeti Bank. In his opening address the Governor stated that central banks today needed to return to more traditional roles while also keeping the required part of the unorthodox measures they were forced to adopt during the crisis. Commercial banks, in turn, should assume a leading role in financial mediation.

The opening address was followed by a presentation by Marek Belka, Governor of the National Bank of Poland, on the effects of low interest rates and weak euro area growth on the economies of the CEE region. The Polish governor described how low interest rates in Poland, Hungary, the Czech Republic and Lithuania contributed to robust GDP growth last year through corporations' access to low-cost loans and through the pick-up in household lending.

In his presentation, Erdem Başçi, Governor of the National Bank of Turkey focused on prudence as a fuel of balanced growth, emphasising the importance of rational macroprudential policies. The Turkish Governor explained that interest rates were around 25 per cent in Turkey before the crisis, and they were cut back to around 2 per cent during the years of the crisis. In addition to consistently falling global interest rates since the 1980s, tighter macroprudential policies had been essential

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in the reduction of the interest rate and hence, in the emergence of healthier Turkish lending practices.

On behalf of the National Bank of Romania, Deputy Governor Bogdan Olteanu talked about Romania's difficult but successful fiscal consolidation and the main issues faced by the Romanian banking sector. While Deputy Governor Olteanu admitted that the previously envisaged adoption of the euro in 2019 no longer appears to be realistic, he said that there is social consensus in Romania about the necessity of accession to the euro area. Regarding the status of the banking sector the Deputy Governor explained that, following the downward trend observed in financial intermediation in recent years, 2015 saw a moderate recovery in lending, primarily owing to leu-denominated household and corporate loans. In line with regional trends, interest rates have fallen in Romania in recent periods, although with some lag compared to other economies of the region due to higher Romanian inflation. Finally, with respect to Romanian banks operating with Greek capital, Mr Olteanu pointed out that the prudential indicators of the banks concerned are adequate.

The next presentation was delivered by Stanislava Zadravec Caprirolo, Vice-Governor of the National Bank of Slovenia, who offered a regulatory and risk-based approach to the future of the banking sectors of the Central and Eastern European region. In the opinion of the Deputy Governor, a healthier proportion could be achieved between capital assets and bank financing if the weight of the latter was reduced. Generally speaking, there is room for consolidation in the banking system, which, in the Slovenian banking sector, translates into a declining number of banks.

The morning session closed with the presentation of Andreas Ittner, Deputy Governor of the Austrian central bank. The Deputy Governor discussed the substantial exposure of Austrian banks to Central and Eastern Europe, the heterogeneity of the region and the lessons drawn from the period of the crisis. Among the lessons he mentioned the threats posed by excessive credit growth relative to deposit growth, the use of foreign currency loans as a mass product, risk-taking without adequate buffers, excessive optimism and uncoordinated action. At the same time, Mr. Ittner pointed out that – considering that the region's growth exceeds growth in the euro area – it is still worth having a presence in the Central and Eastern European region; moreover, due to borrowers' higher risk-sensitivity and the role of macro and microprudential supervision, credit supply is more sustainable.

The afternoon session was opened by a presentation of Chairman and CEO of MKB Bank, Ádám Balog. The focal point was an analysis of successive generations' use of banking services and the trends observed in this regard. The key thought of the

presentation was the importance of understanding that increasingly important but less loyal Y and Z generation customers demanded non-traditional, more technology-savvy services with a broader service content.

The next speaker, Chairman and CEO of UniCredit, Mihály Patai, dedicated his presentation to the weakness in bank lending, pointing out that the root cause of the malady is not necessarily the limited supply of credit. Comparing the countries of the region, Mr Patai said that there were no complaints about the volume of credit in countries with a lower ratio of non-performing loans. At the same time, the losses sustained by the Hungarian banking sector were higher than average, and the share of bad debts is high. After Hungary's accession to the EU, EU funds took over the role of working capital investments at a rate comparable to that of the Marshall plan, which was supplemented by the Funding for Growth Scheme especially in vehicle manufacturing and agriculture.

The next presentation on the prospects of the banking sector was held by László Bencsik, Deputy CEO of OTP Bank. He commended the positive effects of the conversion of foreign currency loans and the self-financing programme, and touched upon the relationship between lending and economic growth and the key role of the Magyar Nemzeti Bank in establishing the conditions for growth and lending. He also outlined the structural features and problems of the Hungarian economy that impede bank lending. Regarding the prospects of the Hungarian banking sector, Mr Bencsik said that, as opposed to the other Visegrád countries, the Hungarian banking sector had been producing losses for years; however, without the bank levy and the other extra burdens, over the medium term Hungarian large banks may achieve a return of around 10% once again, amid declining costs of risk.

Éva Hegedűs, Deputy Chairperson and CEO of Gránit Bank, dedicated her presentation to the banking sector of the future. While the crisis deteriorated the earnings potential of the banking sector, a spectacular market shift failed to materialise, the CEO pointed out. At the same time, future success hinges upon the rethinking of the strategy, technical developments, cost reduction and credible bankers. She explained that the strategy of Gránit Bank combines innovation with conservatism; she talked about the stable performance of the Bank and the ongoing implementation of new electronic solutions.

Next, Levente Szabó, CEO of Takarékszövetkezeti Bank presented the history and current European situation of the sector of cooperative credit institutions, and described the reasons, results and expected further steps of the recent integration process. Finally, he presented the typical indicators and the performance of the sector, pointing out that thanks to the integration, the cooperative bank sector

stands better chances to become a driver of Hungarian economic growth, which was a previously unattainable achievement.

Finally, Márton Nagy, Deputy Governor of the Magyar Nemzeti Bank, gave a presentation on the status of banking sectors across the Central and Eastern European region comparing Hungary to its regional peers in terms of the dynamics of corporate and household portfolios, the ratio of non-performing loans, the credit-deposit ratio, capital adequacy, return on capital employed and the operating expense ratio. He emphasised that, at 65.66 per cent, the Hungarian banking sector recorded the worst operating expense ratio of the ten countries included in the comparison. According to the indicators, the banking sectors of the region can be divided into two distinct groups. The banking sectors of the vanguard boast healthy growth, while laggards – including Hungary – continue to face grave problems.

The conference was closed by Árpád Kovács, President of the Hungarian Economic Association who, in reference to the ample criticism received by the Hungarian central bank in recent periods, stressed that in addition to maintaining price stability, the Magyar Nemzeti Bank also took upon itself to restart and encourage lending to stimulate the economy. At the same time, the professional community had already agreed at the itinerant conference of economists in early September that the Funding for Growth Scheme of the Magyar Nemzeti Bank is the sole driver of corporate lending today, and therefore, its continuation is essential.

The Financial and Economic Review in 2015

In the last issue of the year we would like to make a short summary of the published studies, the authors and our reviewers in 2015. This year the Financial and Economic Review published 24 studies, 2 essays, 2 discussions, 2 reviews, 31 book reviews, 4 conference reports. We publised a special issue (Structure and Evolution of Banking Systems) in November in which our authors presented the transformation of the banking sector in 16 independent countries in the pre and post crisis period.

Our 97 authors were mainly colleagues of the Magyar Nemzeti Bank but we have received a number of manuscripts from Hungarian and foreign academics, researchers and government officials.

Our authors in 2015:

István Ábel,
Dénes Ádám,
Gergely Baksay,
Gergely Balla,
Ádám Balog,
Ádám Banai,
József Banyár,
András Bethlendi,
Zsuzsánna Biedermann,
Katalin Bodnár,
László Bodnár,
Csilla Bokor,
Péter Császár,
Orsolya Csortos,
Bálint Dancsik,
László Delikát,
Szilárd Erhart,
Péter Fáykiss,
Dániel Felcser,
Zénó Fülöp,
Balázs Hidasi,
Dániel Horváth,
Bence Illés,
Tamás Ilyés,
Péter Kálmán,
Péter Kalmár,
Zsuzsa Kékesi,
Gergely Kicsák,
Balázs Kóczián,
András Kollarik,
Pál Péter Kolozsi,
Laura Komlóssy,
Zsolt Kovalszky,
Gyöngyi Körmendi,
Emese Kreiszné Hudák,
Péter Lang,
Bence Lányi,
Kristóf Lehmann,
Imre Ligeti,
Anita Lovas,
János Lukács,
Miklós Luspay,
Annamária Madarász ,
Eszter Makay,
Domician Máté,
György Matolcsy,
Róbert Mátrai,
Attila Méhes,
Dániel Módos,
György Molnár,

Péter Monoki,
Balázs Mucsi,
Márton Nagy,
Zsuzsanna Novák,
Tamás Nyitrai,
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Peter R. Orszag,
Gábor P. Kiss,
István Papp,
Beáta Pappné Kovács,
János Pereczes,
Cecília Pintér,
Ádám Plajner,
Viktória Rába,
István Schinder,
László Seregdi,
Balázs Sisak ,
Gábor Dániel Soós,
Martin Stancsics,
András Sulyok,
Lajos Szabó,
András Szabó-Solticzky,
János Szakács,
Zoltán Szalai,
Szabolcs Szentmihályi,
Ádám Szepesi,
Róbert Szini,
Attila Tapaszti,
Thomas F. Huertas,
Ede Tóth,
Tamás Tóth,
Ágnes Tőrös,
Nikolett Vágó,
Balázs Váradi,
Lóránt Varga,
Péter Varga,
Viktor Várpalotai,
Richárd Végh,
Balázs Világi,
Miklós Virág,
Máté Vona,
Balázs Vonnák,
Sándor Winkler,
Zoltán Zéman

The journal strives for publishing only high quality manuscripsts so our reviewers play a crutial role in the publication process. With their professionalism and elaborate reviews they help our authors to write papers with the highest scientific value. In addition, they are helping us to publish only the best studies in the different issues of the Financial and Econmic Review.

When choosing our reviewers (60) we focused on our editorial board in 2015. Besides, academic members, researchers, colleagues of the Magyar Nemzeti Bank, the Hungarian Banking Association, the European Central Bank, the Bank for International Settlements, the European Commission helped us a lot.

Our reviewers in 2015:

Dániel Baksa,
Éva Berde,
Edina Berlinger,
Péter Ákos Bod,
Katalin Botos,
Pál Czeglédi,
Krisztián Csáky,
Katalin Csordás,
Miklós Dobák,
Dániel Dóra,
Balázs Ferkelt,
Attila Fiáth,
József Gáll,
Attila Gáspár,
Dóra Győrffy,
László Havas,
Balázs Havelda,
Éva Hegedűs,
Mihály Hoffmann,
Horvath Julius,
Zsolt Katona,
Dávid Kiss Gábor,
Gergely Kóczán,
György Kocziszky,
Zalán Kocsis,
Ferenc Koreck,
Árpád Kovács,
Erzsébet Kovács,
Levente Kovács,
Tamás Kristóf,
Csaba Lentner,
Miklós Losoncz,
István Magas,
Ágnes Matits,
Mária Tünde Móra,
Tamás Nagy,
Szilvia Németh,
Gábor P. Kiss,
Zsolt Pál,
Anett Pandurics,
István Papp,
Gábor Pellényi,
Klára Pintér,
Péter Pogácsás,
József Poór,
Anna Réthy,
Ádám Rezmovits,
Ibolya Schindele,
Géza Sebestyén,
Roland Straub,
Antal Balázs Stréda,
Zsanett Sütő,
Róbert Szegedi,
Olivér Szép,
Előd Takáts,
Máté Tóth,
Kata Váradi,
Péter Vass,
Levente Zsembery,
Alíz Zsolnai

Thank you for our authors and reviewers for their high quality papers and reviews. We definitely count on their professional commitment in the future.

We would like to wish you a Merry Christmas and a Happy New Year!

On behalf of the editorial office:

Szabolcs Pásztor
Editor-in-Charge

INSTRUCTION FOR AUTHORS

Manuscripts should be submitted in accordance with the following rules.

- The length of the manuscripts should be limited to 40 000 characters (including spaces) but a ± 50 per cent deviation is accepted. Manuscripts should be written in Hungarian and/or English.
- Papers always begin with an abstract which should not exceed 800–1000 characters. In the abstract a brief summary is to be given in which the main hypotheses and points are highlighted.
- At the bottom of the title page a footnote is to be given. The footnote contains every necessary information related to the paper (acknowledgement, relevant information etc.). This is followed by the name of the institution and position the author works at, e-mail address in Hungarian and English.
- Journal of Economic Literature (JEL) classification numbers should be given (three at least).
- Manuscripts should be written in clear, concise and grammatically correct Hungarian and/or English. Chapters and subchapters should be bold.
- Manuscripts should contain the list of references with the first and surname of the authors (in case of non-Hungarians the initials of the first name is required), the year of publication, the exact title of the book, the publisher, the place of publication. In case of papers, the exact title of the journal, the year, the volume, and the pages should be indicated. References in the text should contain the surname and the year separated by comma. When citing, the exact page be indicated.
- Tables and figures are to be numbered continuously (chapters and subchapters should not contain restarted numbering). Every table and figure should have a title and the units of quantitative values are to be indicated. Tables and figures are to be made by MS Word and Excel in Hungarian and English. Notes and sources are to be put directly at the bottom of the tables, figures.
- Equations should be aligned to the right and should be numbered continuously in parenthesis. (Chapters and subchapters should not contain restarted numbering.)
- Manuscripts are to be sent to the Editorial Office of the FER only. Papers are peer-reviewed by two independent and anonymous reviewers.
- Manuscripts should be sent as attachment by e-mail in MS Word file. Figures and tables should be sent in MS Excel file both in Hungarian and English.
- In case of further questions related to the manuscript visit the following website: *http://english.hitelintezetiszemle.hu/szerzoknek/Authors_Guide_EN.pdf*

Thank you!

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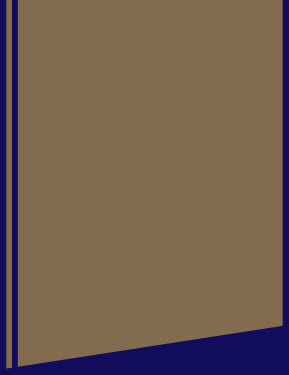

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