Gergely Kiss: Fast credit growth: equilibrium convergence or risky indebtedness?

This article is of relevance from an economic policy point of view – it attempts to answer a question of current economic relevance raised in many member states of the European Union. Is the fast credit growth witnessed in recent years part of an equilibrium process or rather an excessive rise in lending involving risks? The analysis prepared by the MNB suggests that in the new EU member states, the macroeconomic trends explain in great depth the rapid growth in lending witnessed since the transition to a market economy. It is important to note, however, that there are signs of excessive growth in lending in the region, particularly in the Baltic states. Stability risks may arise in Hungary in relation to the increase in household lending experienced in recent years.

INTRODUCTION

In economics, an observed economic process may, in many instances, be assessed with a variety of substantiated theoretical considerations, from which different conclusions may be deduced. The current fast credit growth, witnessed in most new member states of the European Union, including Hungary, is such an example. According to one argument, the rapid growth in lending, on the rise from very low levels recorded in the initial years of the transition to a market economy, is a sign of the healthy growth of the financial system, which assists these countries in implementing faster convergence with EU income levels. Others argue that if the stock of loans grows at an excessive rate, resulting in a credit boom, this may lead to major economic losses, even entailing a bank or exchange rate crisis. Many south Asian countries confronted such extremely grave problems in the 1990s, during the Asian financial crisis. In light of the above conflicting views, it comes as no surprise that the assessment of the credit boom has become an intensely debated economic policy issue throughout Europe in recent years.

With reference to an MNB study soon to be published (Kiss-Nagy-Vonnák: Credit Growth in Central and Eastern Europe: Trend, Cycle or Boom [2006]), this article aims to analyse the extent to which credit growth witnessed in recent years is to be considered part of the equilibrium, hence convergence process, and to what extent it reflects risky trends which may lead to a credit boom.

The article is structured as follows: we first summarise the most important theoretical relationships and discuss the possible economic approaches to excessive credit growth; without highlighting technical details, we then present the main empirical results of the MNB study; finally, we identify economic policy conclusions on the basis of the above.

ECONOMIC BACKGROUND

According to the generally accepted theoretical approach, credit growth may be divided into three categories: trend, cyclical component and excessive growth, that is, boom. Trends may best be defined with macroeconomic variables, as we will see below. The cyclical nature of lending is strongly linked to the general economic cycle, which may, in the given case, be strengthened by the financial system through a change in asset prices. Excessive credit growth, a possible credit boom, is generally defined as the difference between the actual growth in lending and the balance determined by the aforementioned two components (trend and cycle).

As implied above, the definition of equilibrium credit growth is a key issue. We analyse below the explanatory variables which may play a dominant role in the equilibrium level of credit growth in the new EU member states. The most important relationship is represented by the correlation between loan stocks and the economy's level of development. In economics literature, loan stocks are often defined in proportion to GDP; this quotient is considered to be one of the most important indicators of financial depth. Economists agree that there is a strong positive correlation between financial depth and the level of economic development. In other words, in the process of convergence, not only does the stock of loans increase in proportion to GDP growth, but also at an exceeding rate; thus the credit/GDP rate is on a continuous rise. The causal link may function in both directions – a more developed economy contributes to financial depth, and deeper financial markets may accelerate the growth of the economy through the more efficient allocation of savings. On the basis of the close link between financial development levels and economic growth, international financial organisations (IMF, World Bank) recommend to emerging countries reform of the financial system and improvement of its efficiency, thereby promoting dynamic real economic growth in the longer term.

Numerous other factors may affect the depth of financial mediation. These include real interest rates, inflation and the impact of the openness of money and capital markets, and the strength of competition between banks. The effect of lower real interest rates is clear – the fall in the cost of credit increases credit demand.

High inflation may cause a decrease in credit demand through two channels. In practice, higher inflation is associated with greater inflationary uncertainty. Growing uncertainty bears an impact on the whole of the economy; due to less predictable future trends, uncertainty particularly grows in the assessment of future cash flows, which directly affects credit demand and supply. Rising inflation also results in more stringent liquidity constraints.[1] Due to the latter effect, the rise in inflation – through increasing monthly instalments – prevents an increasing number of households from drawing, for example, consumer or mortgage loans.

The elimination of barriers to international capital flows and the liberalisation of the financial system also promote the deepening of financial markets – they intensify competition and contribute to improving the efficiency of the financial intermediary system. Summarising these economic impacts, we may establish that economic growth, decreasing real interest rates and inflation, and the liberalisation of the financial system all increase the financial depth of an economy, contributing to the equilibrium growth of loan stocks.

COST OF EXCESSIVE CREDIT GROWTH, STABILITY RISKS

Following the outline of theoretical foundations, let us summarise the main costs and risks of excessive credit growth, as examined in the literature. With regard to stability risks, one of the most important correlations is established between credit growth and the external borrowing position, the current balance of payments. Accelerating credit growth – often reflected in the worsening of the foreign trade balance – is frequently also financed with external funds, in addition to domestic savings. Thus, a credit boom is often accompanied by a high deficit in the current balance of payments. According to one of the most important conclusions drawn in a recent study of the IMF (IMF 2004), examining the whole global economy, data on recent decades indicate that 75% of credit booms witnessed in emerging countries lead to a bank crisis, and even a higher rate (85%) to an exchange rate crisis. In addition to

determining risks, the IMF study considers it important to emphasise that rapid credit growth, in itself, does not correspond to risky credit expansion; the latter is much less likely to develop in the given economies.

In the period of a credit boom, the worsening quality of bank portfolios may also be a source of additional risks. Growth in lending often implies that the range of borrowers expands and lending increases in segments considered earlier as volatile. Considering that repayment problems typically do not arise in the initial period following the extension of the credit, the quality of the credit portfolio worsens only later when the stock of risky credits has grown significantly among the banks.

WHEN IS THERE A CREDIT BOOM?

Following the review of macroeconomic explanatory variables and stability risks, the question arises: how can we in practice determine equilibrium credit growth? Beyond what level is credit growth judged to be risky? Economics literature has basically formulated three answers. The simplest answer is the assumption of a fixed limit. Irrespective of the economic fundamentals, we determine a limit value, and credit growth exceeding such limit is considered to be risky. This rule is quite similar to a speed limit on the roads.

The basis of the second possible answer is provided by defining the trend with historical data. The logic of this is based on the premise that, in the given long term, the explanatory variables are fully incorporated in the loan stock. The equilibrium path of the loan may be directly observed on the basis of the long time series. Using the above illustration, in this case, the speed limit for cars is determined on the basis of speed measured in the previous period, that is, the limit has the potential for a sudden change in speed.

The third answer is linked to the development of economic fundamentals and explanatory variables. Let us examine the precise crediting dynamics warranted by the development of GDP, real interest rates, inflation and the other possible explanatory variables; this estimate is considered to be the equilibrium path. The actual rate of growth in excess of the equilibrium may involve risks. Now, the speed limit is determined according to the current condition of the engine, brakes and the chassis.

Among the three alternatives, the MNB study chose the last one. The first option is a mechanically constructed, exces-

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[1] The liquidity constraint means that households are unable to draw loans in an amount sufficient for the optimal consumption path; that is, they are unable to appropriately smooth their consumption.

sively inflexible rule, in full disregard of macroeconomic trends, rapid economic convergence characterising new EU member states and the initially low rate of crediting. As an important, practical counter-argument against the second option, a time series of adequate length is, at this point, unavailable in relation to Hungary and the other new EU members, which would enable the reliable calculation of the equilibrium path.

The approach based on explanatory variables produces estimates through the application of econometric methods. Prior to discussing the results, we briefly outline below the econometric methodology used in the study and its economic interpretation.

ESTIMATION METHODS

Two databases could be prepared by considering the quarterly and annual time series of explanatory variables described above in the theoretical section (GDP-purchasing power parity[2], real interest rates, inflation). The first database contains aggregate data, i.e. covering the whole domestic private sector. The second database treats the two sectors separately, data on households and companies.

We will briefly discuss loan stock data and the explanatory variables. We have not yet accurately defined the loan stock – this is essential for the estimation. The consolidated balance sheet of the banking system allows easy access to data on the loan stocks of the resident non-financial private sector (households and companies). Our task is somewhat complicated by the fact that there are no barriers to capital flows in the EU and thus resident companies – primarily firms with an international background – also directly draw foreign loans. Such borrowings, however, are not included in the balance sheet of the resident banking sector. From an economic point of view, both loan stock indicators may be of relevance, therefore data containing foreign loans is more useful in relation to sectoral estimates.

Determining the average real interest rate is similarly important with regard to many new EU member states, due to the high proportion of foreign exchange loans. Foreign exchange lending is chiefly motivated by a smaller interest burden resulting from lower nominal interest rates. In relation to these loans, however, in addition to the foreign exchange real interest rate, the expected change in the rate is also relevant. Considering that a smaller foreign

exchange interest burden contributes to the easing of liquidity constraints, this effect significantly resembles the effect expected upon falling inflation.

In relation to the filtering of the trend, we have noted above that it is difficult to draw substantiated economic conclusions from the results of calculations made with too short a time series. Due to the short time elapsed since the stabilisation of market economies in the new EU member states, this remains an existing practical problem. One solution would be to analyse data on several countries in parallel, that is, perform a panel estimate. As another option, we would not produce direct estimates of the given countries, but prepare estimates with a longer time series of euro zone member states, in our case, and use the received results in relation to new EU members. This approach is particularly warranted in relation to credit, considering that as future euro zone members the new EU member states will join the single financial market in the foreseeable future and become part of the same environment. By combining the two options, the MNB study prepared panel estimates on the basis of data on current euro zone members, relating to the period 1980-2002, and used these parameters for analysing new EU member states.

The study applied the so-called pooled mean group estimator method for the econometric calculations. The essence of the method may be summed up in three points. Firstly, it assumes common long-term parameters from data on individual countries, that is, GDP, the real interest rate and inflation affect loan stocks with an identical co-efficient in all countries. Secondly, differences may arise between individual countries in the short-term dynamics and the constant. The constant defines the characteristics of particular countries; factors which are not directly expressed by the explanatory variables, such as the institutional environment, cultural and historical traditions. Thirdly, it is important to note that the method is based on an error correction model. It presumes that the loan stocks – if departing from the equilibrium level defined by the explanatory variables – in the economy will gradually return to a level of equilibrium. The speed of equilibrium convergence is determined by the adjustment parameter, which also varies per country.

RESULTS

Table 1 indicates that we obtained statistically significant results that are in line with intuition, with both annual and quarterly data.

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[2] The GDP-purchasing power parity filters differences arising from price variations, allowing a better comparison of specific countries' level of development.

Table 1

Summary of estimation results

|	Annual data	Quarterly data
Explanatory variables		
GDP	0.51*	0.75*
Real interest rate	−1.88*	−6.4*
Inflation	−2.04*	−6.12*

Statistically significant variable.

A 1 per cent rise in GDP increases the credit/GDP rate by 0.5-0.75 per cent. In both estimates, the real interest rate and the rise in inflation decreases the equilibrium loan stocks by a very similar rate, implying that the real interest rate and inflation jointly produce an impact through the nominal interest rate. In relation to the annual estimate, the 1 percentage point increase in the real interest rate and in the rate of inflation decreases the credit/GDP rate by 2 percentage points; in the quarterly estimate, this effect is triple. These results are in harmony with the results of estimates published earlier in the literature.

As an illustration, based on the results of the panel estimates, we observe below the equilibrium path of Ireland, recording one of the fastest credit growth rates, and the actual credit/GDP time series.

Chart 1

**Credit/GDP in Ireland: fact and estimated equilibrium**
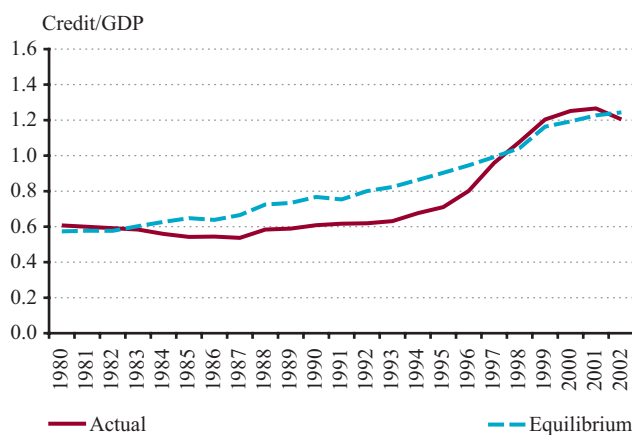
The chart reveals that the macroeconomic fundamentals – exceptionally rapid economic growth and interest convergence preceding the introduction of the euro – confirm the significant rise in the credit/GDP rate, and the actual development of lending steadily followed the equilibrium level during the more than 20 years under analysis.

RESULTS IN THE NEW EU MEMBER STATES – AGGREGATE DATA

As noted in the section on methodology, the estimates for the euro zone comprise only the first step in analysing the new EU member states. How can euro zone related results be used outside of the sample? The answer is simple in relation to long-term parameters: the common values obtained from the estimates and shown in Table 1, can also be used out-of-sample. In other words, GDP, the real interest rate and inflation – presuming the expansion of the single euro zone financial market – similarly affect the loan stocks in the new EU member states. It is more difficult, however, to clearly define country-specific characteristics outside of the sample which are reflected in the constant. The MNB study basically performed the calculations with all constants resulting from the estimates. This method is based on the assumption that the unique constants characterising the new members are in the – considerably wide – range received for the euro zone, and do not fall out of the range.

Chart 2

Credit/GDP in Hungary: fact and estimated equilibrium levels
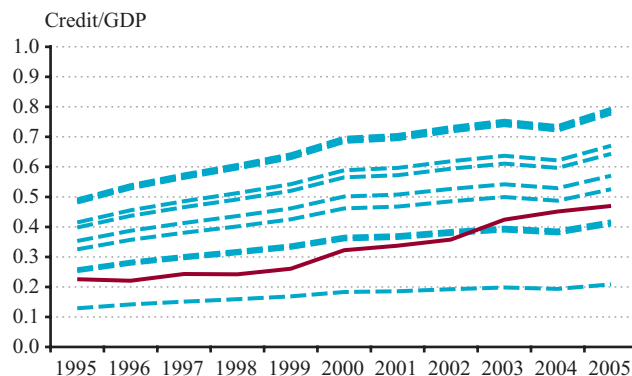
It is clearly visible that the development of the Hungarian economic fundamentals in recent years warranted the significant rise in the credit/GDP rate. The increase of the equilibrium level is attributed to the stable and quite

dynamic economic growth witnessed in the past 10 years, the major fall in the rate of inflation and lower real interest rates. As revealed by the chart, the determination of the equilibrium level is compromised by uncertainty – the estimated equilibrium levels fall within a wide range. Despite this uncertainty, it would be warranted to claim that the Hungarian credit/GDP rate is not high on the basis of our estimates, since it falls in the lower part of the estimated range.

Following the assessment of the credit level, we now discuss the growth rate. The model enables us to identify signs of a credit boom not only according to the estimate of the equilibrium level, which is associated with some uncertainty as observed above, but also on the basis of credit growth and dynamics. According to this approach, credit growth is also considered to involve risks if its rate is not excessive, but its dynamics exceed that of the equilibrium.

The table below summarises the current risks in lending in the new member states of the EU, on the basis of the two possible credit boom concepts (rate and dynamics).

On the basis of the table, it may be established that, upon solely examining the levels, the credit boom risk is not high in any of the countries, although loan stocks are in the upper part of the estimated range in two Baltic states – Estonia and Latvia. The picture is somewhat different when analysing the dynamics. In the aforementioned two countries, the growth rate is significantly higher than warranted by the economic fundamentals. This implies that the current dynamics may involve risks. We may determine in relation to Lithuania, Hungary and Slovenia that growth was faster in recent years than warranted by the equilibrium. These signs, however, do not indicate major risks – rapid
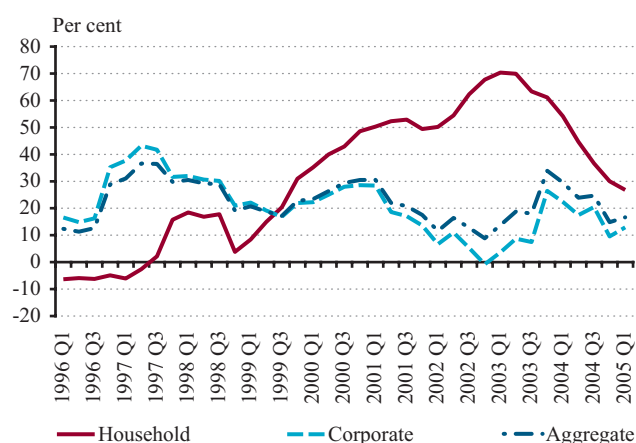
growth may be in harmony with convergence moving from lower levels.

RESULTS IN THE NEW EU MEMBER STATES – SECTORAL DATA

Following estimates related to the whole economy, the

Chart 3

Credit growth in Hungary
(year/yearly rates)

analysis of sectoral trends may provide us with further interesting conclusions. Let us first review Hungarian data.

With regard to aggregate data, it is important to note that the growth rate of the domestic loan stocks fluctuated between the annual rate of 10-30% in recent years. Considering that nominal GDP increased at a slower pace than the average growth rate of lending, this is roughly the same as the growth of the credit/GDP shown in Chart 2. Within the total loan stock, household lending is increasing at the fastest pace. Although the growth

Table 2

Risk of credit booms in the new EU member states

	Level	Dynamics
Estonia	average	high
Latvia	average	high
Lithuania	low	average
Hungary	low	average
Slovenia	low	average
Poland	low	low
Slovakia	low	low
Czech Republic	low	low

rate of this component has been decreasing at a steady rate since the stringency measures of 2003 related to the housing subsidy system, it still approximates 30%. The growth rate of corporate lending has been significantly lower in recent years.[3]

The growth in household and corporate lending in recent years in Hungary reflects a typical trend among new EU member states. Thus, the question arises: can credit booms be identified in the particular sectors? In view of the above trends, the answer may be particularly relevant in relation to households.

Similarly to aggregate data, the premise of sectoral analysis is also based on the estimation of the euro zone. According to econometric tests, estimates performed with identical explanatory variables (GDP, real interest rate, inflation), but with shorter time series, are considered to be less reliable than aggregate data.

With regard to households, the results are roughly in harmony with the aggregate estimates. The signs of the explanatory variables are identical and all three are significant, but there is variation in the level of the effect. Real interest rates and inflation play a predominant role in household crediting. The major role of inflation is not surprising, considering that liquidity constraints play a significant role in relation to households when nominal interest rates are high due to inflation.

Chart 4

Household lending in Hungary: fact and estimated equilibrium levels
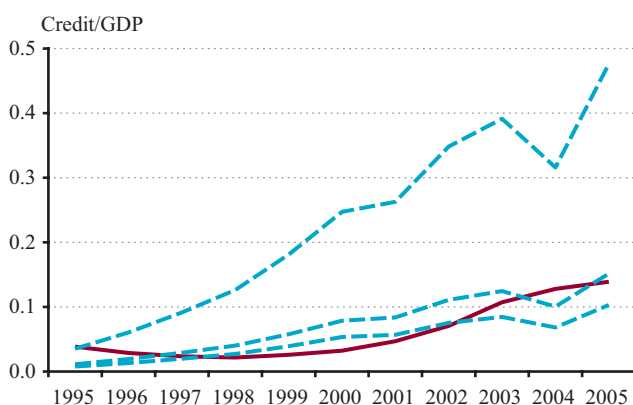
As revealed by Chart 4, the exceptionally high growth in household lending between 2000 and 2004 – when the credit/GDP rate jumped from 3% to 13% – may not be exclusively defined as equilibrium convergence; a part of the growth involves risks. The risks are effectively illustrated by the dynamics of the median[4] equilibrium path. Thus, the equilibrium indebtedness of households rose from 8% in 2000 to 15% of GDP in five years. The trends took a favourable turn in 2005. The pace of growing household lending slowed down and, following a temporary inflationary shock (VAT increase) in 2004, inflation, too, decreased in Hungary to the level of long-term price stability. According to the results of calculations made for the other countries, the indebtedness of Estonian and Latvian households is considered to have risks.

With regard to corporate lending, the sign of the GDP and the real interest rate corresponded to the other estimate results, although the sign of the inflation co-efficient changed. In other words, data suggests that in this sector, higher inflation does not reduce lending, but increases it significantly in statistical terms. It is not surprising that inflation is less correlated with the liquidity constraints of companies, since these – particularly exporting companies – can finance activities with foreign exchange, without assuming exchange rate risks; thus their behaviour is partly independent of domestic nominal interest rates. Upon jointly analysing the co-efficient of the real interest rate and inflation, we may determine that their amount is negative and thus the result is in line with the expected result – a rise in the nominal interest rate among companies reduces the rate of lending. The analysis concluded that growth in corporate lending is not likely to involve risks in the new EU member states, owing mainly to the high rate of foreign exchange loans which were already popular in the previous period.[5] Summarising the sectoral estimates, it is important to emphasise that, despite the partly varying database and the shorter time series, conclusions very similar to aggregate results can be drawn in relation to the lending trends observed in the new member states.

CONCLUSIONS

On the basis of rapid credit growth witnessed in the new EU member states, we may draw the following main conclusions.

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[3] In relation to corporate loan stocks, it should again be noted that this already includes direct foreign loans, the amount of which is not recorded in the balance sheet of the banking system.

[4] The median path signifies an equilibrium path calculated with a euro zone constant, which is located in the centre of distribution with 11 elements (see Chart 2).

[5] It should be noted, however, that segments with higher risks may exist within the total stock of corporate loans which cannot be defined in this macroeconomic model. The increasing foreign exchange debt of the SME sector may be referred to this category.

The rapid credit growth experienced in recent years in the region is basically considered to be equilibrium convergence, although in the Baltic states (particularly in Estonia and Latvia) several indicators suggest an excessive credit growth, especially in relation to the household sector.

Owing to a credible convergence path and the related, favourable income prospects, low inflation and further interest rate convergence, in the forthcoming years the equilibrium credit/GDP rate is expected to rise at a dynamic rate in the new EU member states.

Currently, the risk of excessive credit growth is not judged to be high in Hungary. Inflation, falling to the level of price stability, and the stable growth of the economy supports equilibrium convergence. The lasting external borrowing requirement of the economy, however, strengthens risks arising from credit expansion.

On the whole, caution is advised for Hungary. It is important for economic policy decision makers to monitor crediting developments when assessing macroeconomic trends. This is particularly of relevance to the household sector, where we estimate that credit expansion exceeded the increase in equilibrium between 2000 and 2004.

The participants of the financial sector should also understand the risks related to excessive credit expansion in the current macroeconomic situation, and act with due diligence in lending, especially in relation to more risky segments (e.g. foreign exchange loans without natural hedging).

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