



Analytical background for the counter-cyclical capital buffer decisions in Slovakia

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Recent regulatory changes at the European level driven by Basel III concept introduced a macro-prudential policy as a standard tool in the hands of national authorities. The new toolkit includes a fistful of instruments to mitigate cyclical or structural systemic risk threatening financial stability. Most of the tools, including the counter-cyclical capital buffer, are in some way related to capital requirements. This is to increase the probability that banks are able to face future unexpected losses stemming from emerging systemic risk. Although capital buffers are undoubtedly a strong mitigating tool for dampening the systemic risk, history teaches us that financial stability is not only about ever larger buffers, but sound incentives play a crucial role as well.

¹ FSA [2009] The Turner Review. A regulatory response to the global banking crisis. March 2009.

INTRODUCTION TO MACRO-PRUDENTIAL POLICY AND CAPITAL BUFFERS

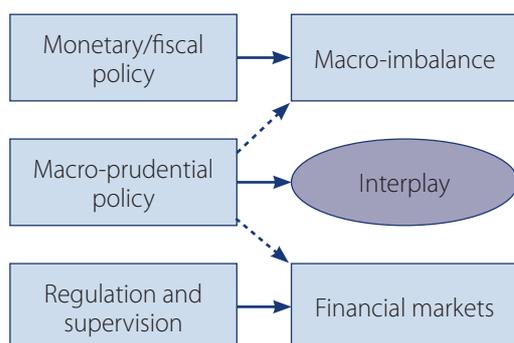
The introduction of macro-prudential policy was related to a growing need to link the long-existing macro-prudential analysis with real policy implications. As noted by the FSA (2009), "At the core of the crisis lay an interplay between macro-imbances which had grown rapidly in the last ten years, and financial market developments and innovations which have been underway for about 30 years but which accelerated over the last ten to 15, partly under the stimulus of the macro-imbances"¹. There are two key concepts in this complex statement: macro-imbances and financial markets. The question of macro-imbances is usually covered by monetary and fiscal policies while financial markets fall under the scope of financial regulators and prudential supervisors. Even if these two separate areas are covered by specific policies, interplay between them deserves particular attention. If financial institutions are fuelling macroeconomic imbalances, an integrated policy response would be more efficient than an uncoordinated reaction of separate authorities.

In this context, the ultimate objective of the macro-prudential policy is to safeguard financial stability by making banking sector less vulnerable to the systemic risk. Since the systemic risk is by definition linked to macro-imbances, making banking sector less vulnerable should also break the vicious circle between financial markets and macro-imbances. Therefore, macro-prudential policy is generally expected not only to increase robustness of the banking sector over the financial cycle but, as a side effect, it could also contribute to a more sustainable macro-economic development as well.

For this purpose a set of instruments has been put at the disposal of the macro-prudential authority. They are targeting the systemic risk of cyclical or structural nature with a different level of detail. However, even if now instruments appear to be fully in the hands of macro-prudential authorities, their use remains only a part of work. Most of the financial stability questions are also related to incentives created by financial regulation. Therefore macro-prudential authorities should be active also in other areas, including deposit guarantee schemes, role of mortgage brokers, fiscal support for housing loans, treatment of sovereign debt in capital and liquidity regulation, etc. They should also understand the internal models of local banks and monetary policy of their central bank. All this is necessary to make the policy more efficient and also to avoid unnecessary contradictions or overlaps with other decisions of public authorities.

Nevertheless, the macro-prudential toolkit is more complex than just capital buffers. Before requiring banks to build and hold an additional capital buffer, authorities may try to exploit other options. These typically include new monitoring or disclosure rules, soft or more formal recommendations to banks, meetings with bank managers or the on-site supervision channel.

Figure 1 Role of macro-prudential policy



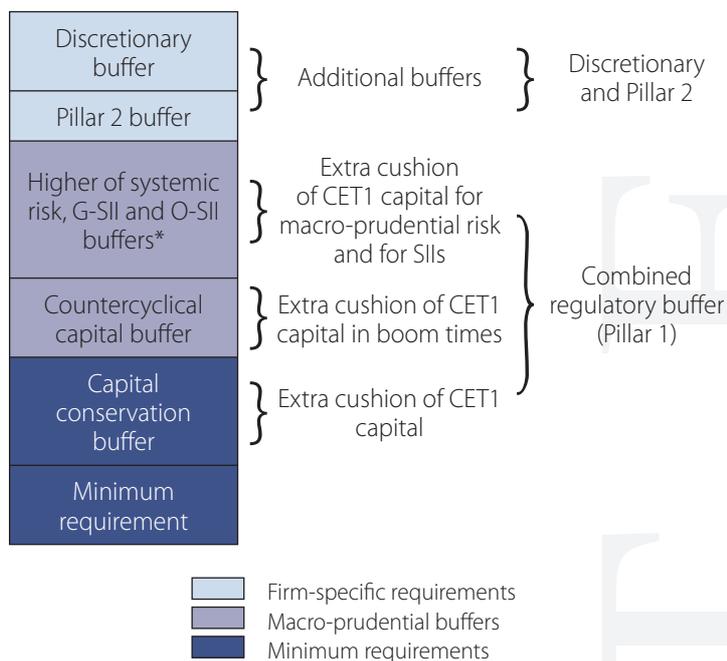


COUNTER-CYCLICAL NATURE OF THE BUFFER

Counter-cyclical capital buffer is one of the macro-prudential instruments which have a crystal clear cyclical nature with a very large scope. Its cyclical nature reflects the concept of building capital buffers in good times when loans are extended at a large scale and using the built buffers to absorb losses from these loans in bad times. This is often referred to the principle of “leaning against the wind” or to the historical evidence that “bad loans are provided in good times”. Consequently, to make the counter-cyclical capital buffer work efficiently, it is indispensable to identify the periods of excessive growth of private debt. If excessive lending growth is identified early enough, the buffer can be activated and in order to lean against this imbalance.

According to the Basel III framework and its transposition to the CRD IV, counter-cyclical capital buffers should be built when the credit-to-GDP deviates from its long term trend, when the credit-to-GDP gap becomes positive. This approach is based on BIS (2010) and Drehman (2011), where its reliability has been empirically showed on a sample of countries. The idea behind the credit-to-GDP gap, as an indicator of excessive credit growth is related to the relationship between financial and economic cycle, i.e. between lending market developments and macroeconomic trends. Deviation of the credit-to-GDP ratio from its long term trend implies that debt of households and enterprises has not only been growing faster than the GDP, but also the difference in their respective growth rates is increasing. In a very simplified structure, this refers to a situation, when new debt is not sufficiently contributing to GDP growth. This typically happens when new credit growth is spent on

Figure 2 Capital requirements including macro-prudential buffers



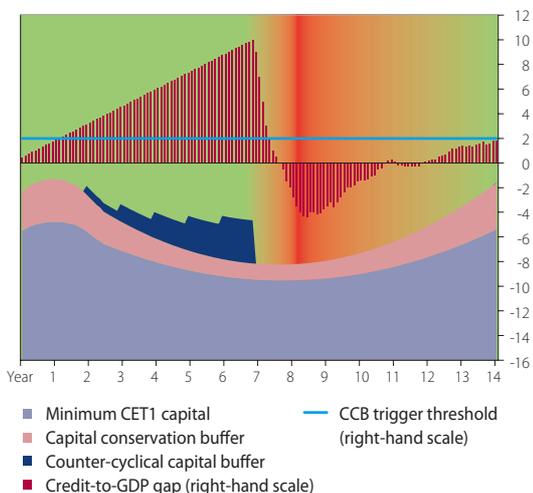
Source: ESRB.
*In certain cases can be the sum of SII and systemic risk buffers.

imported goods and thus contributes to the GDP of the exporting country. Deepening current account deficit is traditionally a good indicator of emerging macro-imbalances and thus can support the arguments for using the credit-to-GDP gap as an indicator to identify the build-up phase. Nevertheless, credit-to-GDP gap metrics has several serious weaknesses:

- Comparing stock and flow variables: GDP as a flow variable is potentially more volatile than the stock of debt;
- GDP growth: using the GDP as a robust macro-economic indicator against which credit growth is assessed whether it is excessive or not ignores a possible excessiveness of GDP growth itself;
- No levels of thresholds: If the credit is growing faster than GDP, but it is not accelerating, the credit-to-GDP can rise infinitely without signalling any excessiveness;
- Focus on private debt only: Although no capital is held for EU sovereign exposures, public debt can be a source of a vulnerability, macro-imbalances or excessive indebtedness;
- Gross stock of debt only: Possible changes in the stock of the debt due to bad loan write-offs or sell-offs are interpreted as deleveraging.

These weaknesses might be common for many comparable indicators used for similar purposes and they should not lead to a general repulsion of the credit-to-GDP gap as a concept. They should only underline importance of a very careful and cautious interpretation of such indicators when taking decision about capital buffers.

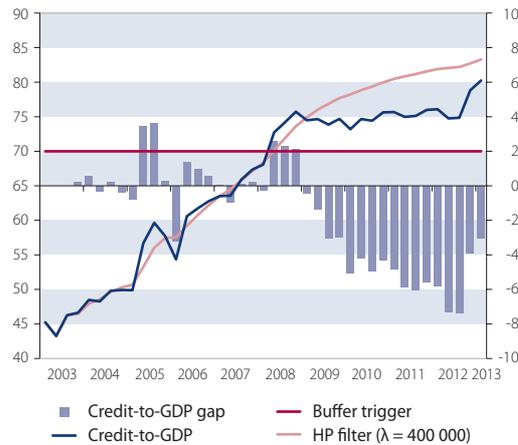
Chart 1 Build-up and release of the counter-cyclical capital buffer



Source: ESRB.
Note: Green background indicates „good times“ while red background means „times of stress“.

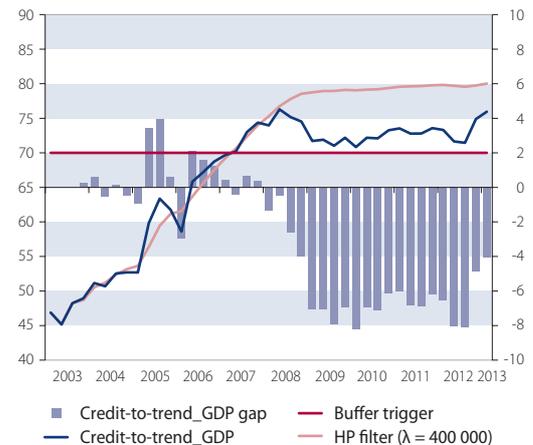


Chart 2 Credit-to-GDP gap in Slovakia



Source: NBS, Statistical Office of the SR, own calculations.

Chart 3 Credit-to-trend_GDP gap in Slovakia



Source: NBS, Statistical Office of the SR, own calculations.

2 Basel Committee on Banking Supervision [2010] Guidance for national authorities operating the countercyclical capital buffer. Bank for International Settlements.

WHY THE CREDIT-TO-GDP GAP METRICS DOES NOT WORK FOR SLOVAKIA

When calculating the credit-to-GDP gap for Slovakia, we immediately face several problems. Firstly, the data series for lending market are distorted by past structural changes in the Slovak economy and restructuring of its banking sector. There is a major influence of the bad loans write-offs in corporate sector loan portfolio virtually inhibiting any serious trend analysis until 2004. Similarly, even if household debt existed back in 1995, its real development started only with the mortgage market expansion from 2003. This noise reduces the period of our data series to less than 10 years, i.e. approximately 40 quarterly observations. Application of the Hodderic-Prescot filter with a recommended value of lambda of 400,000 seems to be inappropriate for such a small number of observations.²

Secondly, taking into account changes in Slovak GDP growth (both nominal and real) over the period of 2004 – 2013, it is difficult to use it as a robust benchmark to assess potential excessiveness of the lending market. Being a small and open economy, Slovak GDP proved to be more volatile than the stock of debt. Thus, the changes in the credit-to-GDP gap were increasingly driven by the GDP and not predominantly by lending activity. This leads to two different noise signals in the Slovak credit-to-GDP gap. Spectacular credit growth in 2005 – 2008 feeding bubbles on residential and commercial property markets did not increase the gap because the GDP was also growing at an unprecedented speed. In an oversimplified picture, excessive credit growth was masked by excessive GDP growth. Another noise in the data appeared in 2009, when GDP growth went negative, while the volume of loans, being a stock variable with strong inertia, were only flat. This, mathematically, led to a positive credit-to-GDP gap, exactly in times when the country was most severely hit by the crises. The positive gap would indicate excessive credit growth and would call for building up a capital buffer. But just

the opposite was the case: lending activity was negligible and GDP fell to the levels seen in 2007. Triggering counter-cyclical capital buffer would have had a negative impact on both banks and lending market.

The most important problem, comparison of a relatively volatile flow variable (GDP) and a stock variable with a reasonably stronger inertia (debt) can be partially resolved by using a trend of the GDP instead of simple quarterly GDP. Replacing the “snapshot GDP” with its longer trend leads to a higher robustness of the results, particularly in a small and open economies like Slovakia.

However, even if application of GDP in the form of a trend corrects the noise signal in 2009, it remains feeble in signalling excessive lending in 2005 – 2008. The gap remains very small as excessive growth of debt was offset by excessive growth of the GDP. Wisely, the legislator understands that credit-to-GDP gap might not be the only and the best indicator for all different countries across the EU. The CRD IV leaves an open door for the national authorities to anchor their calculation on recommendations issued by the European Systemic Risk Board or on any other variables that the designated authority considers relevant for addressing the cyclical systemic risk.

IDENTIFICATION OF VARIABLES WITH INFORMATIVE POWER ABOUT EXCESSIVE CREDIT GROWTH

Recent history of the Slovak economy and its lending market makes it difficult to identify a potential emergence of a cyclical systemic risk by standardized tools (e.g. credit-to-GDP gap) or with market indicators widely used by other countries (e.g. equity prices, funding spreads, etc). The story of the Slovak lending market and its potential excessiveness seems to be much less sophisticated: Small lending market dominated by local universal banks focused on retail business, the absence of a deep and liquid financial market, the housing market being the only market with liquid asset prices, simple and standardized credit



Table 1 Core and supplementary variables

	Core variable	Supplementary variable
Cycles	Credit-to-GDP gap GDP gap	Unemployment rate Property markets
Banks	Credit growth NPL dynamics	Default rates – enterprises Loan-to-value ratios Lending conditions
Customers	Debt burden – households Debt burden – enterprises	Housing affordability index Consumer confidence

Source: Author.

products in the domestic currency, no significant shadow banking, and all this in a small, open and concentrated economy. Taking into account above mentioned characteristics together with short data series not covering the whole financial and economic cycle and noised by structural changes, we see both the room and the need for sophisticated models shrinking. However, decision about counter-cyclical capital buffer rates should be based on a guided judgment as a combination of calculation and discretion. In other words, both man and machine is required.

Our methodology is a therefore a combination of some soft empirical evidence and a general economic theory backed by common sense. But before we could pose a question whether a particular variable or indicator could signal excessive credit growth, we had to divide our short lending market history into two periods. The first period is between 2005 and 2008, where credit growth bore many characteristics of excessiveness including soaring property market and indebtedness of households and enterprises, high loan-to-value ratios and relatively loose lending conditions. The second period goes from 2009 to 2012, characterised by sluggish lending market marked by credit losses amid generally adverse macroeconomic developments. Against this background we have applied a concept of covering three major categories that are expected to be linked to an excessive lending pattern:

- Cycles: Both economic and financial cycle must be covered by some variables or indicators, thus we cannot exclude dynamics of GDP and debt market;
- Banks: There is no excessive lending without banking sector and it surely contains information both on excessiveness and losses indicating a release phase;
- Customers: Excessive lending by definition interacts with indebtedness of households and enterprises.

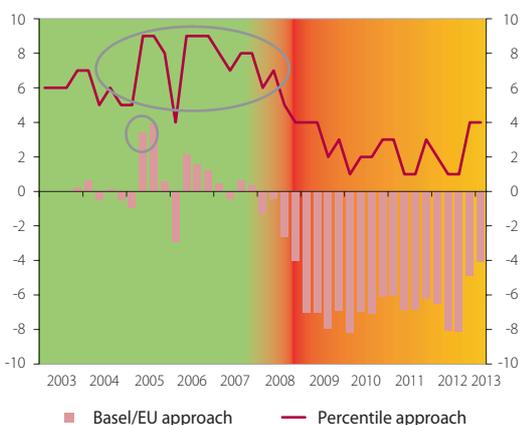
Each of these three categories is covered by a core and supplementary set of variables. Core variables are supposed to be linked to a general excessiveness of lending market and financial and economic cycle as a whole. This is because counter-cyclical capital buffer is a very rough tool requiring new capital for all risk-weighted assets with no possibility to differentiate between mar-

ket segments. Thus, the core set of variables should track the behaviour of the general financial and economic cycle. Supplementary variables are usually giving good signals from certain industry specific segments of the financial and economic cycle.

EVALUATION METHOD OF VARIABLES AND INDICATORS: PERCENTILES

After we have identified variables with cyclical patterns it is necessary to correctly interpret their values and developments over time. But this might be very tricky, since it is not possible to set a clear nominal threshold signalling that a particular variable is breaching its sustainability or moving out of its equilibrium. For example, in some countries households successfully manage to live with higher debt levels than in other countries, or unemployment rate of some 8% in Slovakia would be a very positive figure for the period of previous 20 years, while such level in the United States would already point to severe economic problems. Hence, admitting our incapacity to set thresholds of excessiveness and soundness, every variable or indicator is to be compared within its own history only. Interpretation of this approach is very straightforward: If actual level of variables or indicators has already been observed before,

Chart 4 Credit-to-trend_GDP: Central approach and percentile approach

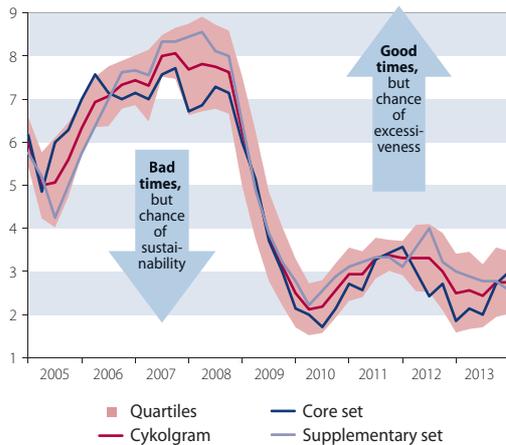


Source: NBS, Statistical Office of the SR, own calculations.
Note: Green background indicates „good times“ while red background means „times of stress“.

FINANCIAL STABILITY

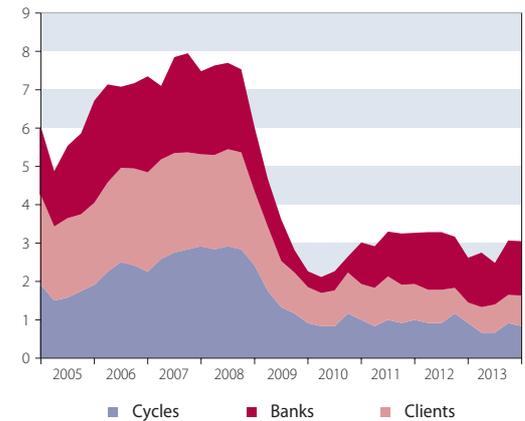


Chart 5 Cyclogram



Source: NBS, Statistical Office of the SR, own calculations.

Chart 6 Cyclogram: three main components



Source: NBS, Statistical Office of the SR, own calculations.

and this period has later proved to be sound and sustainable, by learning from the past we can get a fairly reasonable feeling about the current development. And vice versa, if actual levels are higher than what our economy has ever witnessed before, or if comparable levels were breached during the periods of excessive lending, this would be a strong starting point for a decision on the counter-cyclical capital buffer.

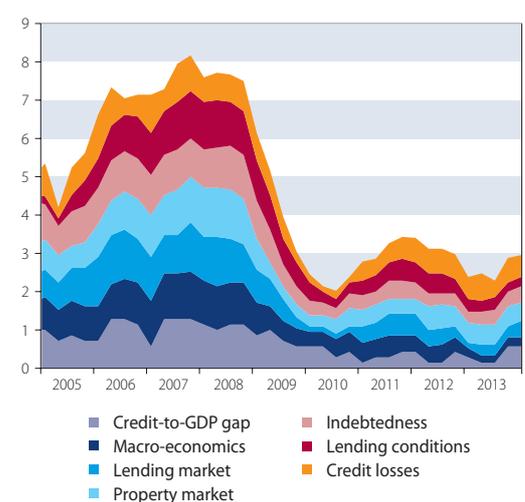
As mentioned above, each of our core and supplementary variable is evaluated against the distribution of its own historical values. A number between 1 and 9 is assigned to the actual value of the variable depending on its position in respective percentiles of its historical distribution. The advantage of our approach can be demonstrated on the credit-to-trend_GDP gap. As already demonstrated (see Chart 4), even after the GDP variable is made more robust using its trend, the centrally proposed metrics failed to give reasonable signals of excessiveness in 2005 – 2008, for the reasons explained above.

The percentile approach identified the whole period of 2005 – 2008 as a phase when the credit-to-GDP gap has reached its highest levels compared to all values observed. This simply suggests that the Basel threshold of 2% gap for counter-cyclical capital buffer activation seems to too low for Slovakia, at least for the period analysed.

AGGREGATION OF VARIABLES AND INDICATORS: CYCLOGRAM

Our use of a set of 6 core variables and another 7 supplementary variables is an analytical consequence of data availability and their cyclical patterns. But for practical reasons related to high level discussions leading to a buffer rate decision, a more efficient starting point is usually "one number" rather than 13 different variables and indicators. Under the percentile approach, each of the 12 variables reaches numbers between 1 and 9. Their simple average can be the most straightforward way of aggregation. In the context of counter-cyclical buffer decision it is indispensable

Chart 7 Cyclogram: Subgroups of variables and indicators



Source: NBS, Statistical Office of the SR, own calculations.

to differentiate between core and supplementary variables. Buffer rate should not be determined by supplementary variables if contradicting the core set. This is because counter-cyclical capital buffer charges all risk-weighted exposures and thus should not be largely driven by cycles in particular segments.

Aggregation of underlying variables into one indicator (cyclogram) creates a good background for a policy discussion. But in such a case many details remain hidden and cyclogram becomes a black box similar to some of the widely used indicators of systemic risk where it is often difficult to isolate contribution of a particular variable or indicator to the changes of output metrics. For this purpose, different types of subgroups of variables and indicators can be displayed. The first approach to subgroups follows the core concept of covering three pillars: cycle, banks and customers (see Chart 6). Under this concept, an important pattern can be identified: The excessiveness in



2005 – 2008 was present in all three segments. Similarly, low percentiles were reached in all three categories in the crisis in 2009. But the slight recovery in 2010 and 2011 was concentrated in the banking segment and it was not strongly present in situation of households and enterprises or in general economic cycle.

This cyclogram information can be further decomposed in more detailed subgroups build on a principle of common economic category. Such decomposition into 7 classes shows that most of the improvement in 2010 and 2011 was related to the growing lending market, lower credit losses and less intense tightening of lending conditions. On the other hand, other important cyclical macroeconomic variables such as GDP growth or unemployment rate remain in lower percentiles of their historical distributions. This decomposition is fully in line with the message displayed on the Chart 6, namely that main part of the recovery observed in this period happened within the banking sector.

READING AND ANTICIPATING THE DECISION BY NÁRODNÁ BANKA SLOVENSKA

From the banking sector point of view it is important not to be surprised by higher capital requirements resulting from a NBS decision to build up a counter-cyclical capital buffer. Although a full forward guidance would be neither appropriate nor possible in this case, sudden surprise can be mitigated by the following:

- Normally, decision on the counter-cyclical capital buffer rate has a longer implementation phase up to 12 months, if not shortened by NBS. This gives banks some additional time to build up the buffer;
- Quarterly decisions by NBS should contain not only the final buffer rate, but also an underlying analytical comment with explanation of the decision including the background data;
- Half-yearly Financial Stability Review is another strong communication channel where more complex assessment of the systemic risk is put in a wider context;
- As mentioned above, the methodology that guides the buffer decision is far from final and will be subject to further changes. Such changes will be communicated in advance to make next decisions more transparent.

However, some challenges for both the banks and Národná banka Slovenska remain open. Fir-

stly, there is an obligation to recognise counter-cyclical capital buffer rates set by other jurisdictions on their domestic exposures. Cross-border banks will need to follow and anticipate decisions on the buffer rate made by other authorities in countries where they have exposures to private customers. Secondly, once the Single Supervisory Mechanism is in place, the European Central Bank may override national decisions on macro-prudential tools by increasing the counter-cyclical capital buffer rate already set by NBS. Such decisions have the same legal force as those by Národná banka Slovenska. Therefore, transparency in methodology and proper communication is indispensable for local banks to anticipate future buffer rates.

CONCLUSIONS

Building a reasonable quantitative background for the guided judgement on the counter-cyclical capital buffer rate in Slovakia is far from obvious. The main challenges are related to short data series interlaced with methodological and structural changes as well as to the absence of a deep and liquid financial market.

Moreover, Basel III metrics of credit-to-GDP gap proved not only to be inefficient in identification of excessive credit growth in 2005 – 2008, but it has also issued noise signals in 2009. Taking into account all advantages and weaknesses of this concept, it is rational to regularly assess its potential application, but in short-term the counter-cyclical capital buffer decision should be based on a different scheme.

Our methodology is based on a set of variables and indicators that showed cyclical patterns over the last ten years. There are no nominal thresholds for the variables; they are evaluated against their historical distribution. An important advantage of this approach is its simplicity and readability; it provides a clear and understandable message. Nevertheless, this metrics will be further tested against actual financial and economic developments and will be modified accordingly.

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