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Basel III: countercyclical capital buffer proposal-the case of Baltics

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Abstract

The objective of countercyclical capital buffer is to encourage banks to build up buffers in good times that can be drawn down in bad times. The aim of the report is to assess such decisions by banks derived from two approaches. The approaches are the aggregate credit-to-GDP ratio as well as credit growth. The approaches are implemented for Estonia, Latvia and Lithuania for the time period 2000–2012. The report compares two approaches and analyses their relevance to the Baltic states by testing the correlation between a growth in studied variables and a growth of corresponding gaps. Methods used in the empirical part of the report are econometric analysis as well as economic analysis, development indicators, relative and absolute indicators and other methods. The research outcome is a cross-Baltic comparison of two alternative approaches to establish or release a countercyclical capital buffer by banks and their implications for each Baltic country.

Keywords: Basel III; countercyclical capital buffer; banks; credit growth; Baltic states.

1. Introduction

The first international capital standard, Basel I, was issued by Basel Committee on Banking Supervision (BCBS) in 1988, and was fully implemented in 1992 by the G-10 countries. The main objective was to secure the holdings of banks, so credit institutions would be capable to absorb losses from the crediting activity.

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This standard only addressed the exposure of banking institutions to credit risk, the amount of capital required to protect against losses by assuring that they hold a capital level of 8% of the total risk-weighted assets.

According to the Balin (2008) after the issue of the first agreement, there was a positive development of methods and techniques of risk assessment and in 2004 Basel II was issued. Basel II offered banks the opportunity to design their own internal models to estimate risk, and at the same time conserving the 8% capital adequacy. To establish the total capital adequacy, credit institutions had to primary determine individual risk exposures to credit risk, market risk and operational risk, and finally add the individual exposures (BIS, 2006).

Between mid-2007 and end-2010, major global banking institutions reported cumulative write-downs to the tune of $1.3 trillion (Bank for International Settlements, 2010). Output declined dramatically. The cumulative impact over 2008-10 on economic activity in the harder-hit advanced economies exceeded 10 percent of their respective GDP, and average unemployment rates shot up from about 5 percent to nearly 9 percent. Between mid-2008 and mid-2009, world GDP contracted by 1.6 percent for the first time in recent memory (IMF, 2011). Unsurprisingly, the experience added impetus to policymakers' and academic economists' efforts to better understand the mechanisms that drive financial system procyclicality and to devise policy tools that can mitigate it (Kunghehian, 2012; Moody`s analytics, 2012).

To address the market failures revealed by the crisis, a revised framework, Basel III, was proposed by BCBS, suggesting a more sensitive approach to the extreme and unforeseen changes in the market. These reforms are meant to strengthen the banking sector and raise the resilience of individual banking institutions to periods of stress with two different approaches, a microprudential focus and a macroprudential focus. These reforms address the system-wide risks that can build up across the banking sector as well as the procyclical amplification of these risks over time. Basel Committee considers that after its implementation, the agreement will greatly reduce the likelihood and severity of a crisis in the banking sector, while enhancing global financial stability. The main objective of this agreement is to improve the banking sector's ability to absorb shocks from economic and financial crises, thereby reducing the risk of contagion from the financial sector to the real economy.

Since their first meeting during the financial turmoil, which took place in Sao Paolo on the second weekend of November 2008, the G-20 has been aware of the problem of procyclicality in the regulatory framework. They agreed that it was important "to address the issue of pro-cyclicality in financial markets regulations and supervisory systems." One week later, in Washington, they referred again to this problem, now under one of the five principles for reform of financial markets, namely the principle of "enhancing sound regulation." They also instructed the International Monetary Fund (IMF), the Financial Stability Forum (FSF), later renamed Financial Stability Board (FSB), and the Basel Committee on Banking Supervision (BCBS) "to develop recommendations to mitigate pro-cyclicality, including the review of how valuation and leverage, bank capital, executive compensation, and provisioning practices may exacerbate cyclical trends. Not only these institutions, but also the G-20 Finance Ministers were requested to formulate recommendations on mitigating against pro-cyclicality in regulatory policy (King and Tarbert, 2011). Therefore, since the beginning of the crisis pro-cyclicality was regarded a key issue to be addressed (BCBS, 2009; BCBS, 2010).

Basel III reforms are meant to strengthen the banking sector and raise the resilience of individual banking institutions to periods of stress. One of the Basel III objectives is to reduce procyclicality and promote countercyclical buffers. According to the Committee one of the most destabilizing elements of the crisis was the procyclical amplification of financial shocks throughout the banking system, financial markets and the economy (BCBS, 2011). As the amount of credits in the economy increased, which was followed by an increase in credit losses, banks have adopted a prudent position immediately, resulting in a restraining credit supply. Their actions intensified the initial crisis, pushing the economy into a deeper recession, with declining asset prices and rising level of unproductive loans (Kauko, 2012).

2. Countercyclical capital buffer proposal

According to the Committee one of the most destabilizing elements of the crisis was the procyclical amplification of financial shocks throughout the banking system, financial markets and the economy. As the amount of credits in the economy increased, which was followed by an increase in credit losses, banks have adopted a prudent position immediately, resulting in a restraining credit supply. Banking institutions were forced to further restrict their crediting activity, because even during the crisis, they considered it necessary to pay dividends or compensation, so avoiding the transmission of negative signs to markets. Their actions intensified the initial crisis, pushing the

economy into a deeper recession, with declining asset prices and rising level of unproductive loans. The Basel Committee introduced measures to make banks more resilient to such procyclical dynamics. These measures will help ensure that the banking sector serves as a shock absorber, instead of a transmitter of risk to the financial system and broader economy (Drehmann & Gambacorta, 2011).

Countercyclical capital buffer is designed to ensure that the banking system has a buffer of capital to protect it against future potential losses when excess aggregate credit growth is judged to be associated with a build-up of system-wide risk. Credit institutions will have to conserve a countercyclical buffer that varies between zero and 2.5% to total risk weighted assets (BCBS, 2010).

Any countercyclical capital scheme will be an overlay over the minimum capital requirements. The cyclicality of the minimum is therefore an important element for the credibility of the overall scheme. Very sensitive point-in-time capital requirements could imply that in good economic times risk-weighted assets decrease by so much that only limited capital is built up relative to unweighted assets. Similarly, in bad times, a highly cyclical minimum could eat into the available capital resources, as the increase in risk-weighted assets adds to the erosion associated with losses. However, it is less important whether the smoothing is achieved by adjusting inputs or outputs. In the absence of smoothing inputs, more of the work would have to be done by the adjustment factor to obtain the desired degree of capital in different stages of the cycle (BCBS, 2010).

Any scheme will need to involve two elements: (i) choosing a conditioning variable that signals the time to build up and release capital buffers; and (ii) choosing an adjustment factor that determines how changes in the conditioning variable map into capital requirements.

According to the Drehman and Borio (2010) key Characteristics of an Effective Instrument:

(i) It should signal the proper *timing* for the accumulation and release of the capital buffer. This means that it should identify good and bad times.

(ii) It should ensure that the *size* of the buffer built up in good times is sufficient to absorb subsequent losses, when these materialize, without triggering serious strains.

(iii) It should be *robust to regulatory arbitrage*. This includes being difficult to manipulate by individual institutions as well as being applicable to banking organizations that operate across borders.

(iv) It should be as *rule based as possible*, *transparent*, and *cost effective*.

A number of variables come to mind, such as measures of bank performance (e.g. earnings, losses or asset quality, such as non-performing loans), financial activity (e.g. credit), as well as the cost and availability of credit (e.g. credit spreads).

Borio and Drehmann (2009) and Alessi and Detkens (2011) analysed the performance of different conditioning variables by visually inspecting their evolution around historical banking crises. They considered the variables measured as deviations from a long-term trend or average, in order to identify the cyclical component.

2.1. Macroeconomical variables

Real GDP growth: this is the most natural indicator of the aggregate business cycle for an economy. However, the business and the financial cycle, although intertwined, need not be fully synchronized at all points in time. In particular, financial strains do not arise with every recession.

Aggregate real credit growth: the cycle is often defined with reference to credit availability. Aggregate credit growth could be a natural measure of supply, in particular if not only bank credit but all other sources of credit are taken into account. As boom periods are characterized by rapid credit expansion and declines in overall credit are typically considered symptomatic of a credit crunch, deviations of credit growth from a trend could be an informative variable to use.

Credit-to-GDP ratio: The credit-to-GDP ratio provides a normalization of the credit variable to take into account the fact that credit demand and supply grow in line with the size of the economy. In addition, there is a strong link, historically, between faster than average credit-to-GDP growth and banking crises.

Asset price growth: Financial assets and in particular property prices tend to show exceptionally strong growth in periods that precede systemic banking events. They fall precipitously during periods of financial stress. Similar to the credit-to-GDP ratio, we consider deviation of aggregate property prices from their long-term trend, where aggregate property prices are a value-weighted average of residential and commercial property prices.

2.2. Banking sector activity variables

Bank credit growth (also normalized by GDP): Aggregate measures of bank activity tend to be coincident with the broader business and financial cycle. Linking the countercyclical instrument to the growth rate of lending or bank income can be motivated on the basis of attempting to smooth the intermediation (credit) cycle measured more narrowly as in relation to banks as opposed to the financial sector at large.

Banking sector profits: This is a key indicator of performance for the sector. Earnings are high in good times and quickly reflect losses in times of stress. However, profit figures can be the subject of strategic management by banks that can distort their information content.

Aggregate losses: This indicator of performance focuses on the cost side (non-performing loans, provisions etc.). The financial cycle is frequently identified by the rise and fall of the realized losses.

2.3. Cost of funding

Banking sector credit spreads (indices): These are indicators of vulnerabilities in the banking sector (in the sense of the market assessment of the risk of bank failures). By being closely tied to the financial condition of banks they may be subject to manipulation by them, a drawback mitigated by relying on broad indices where they exist. In the analysis we will look at the average of CDS spreads for the largest banks in each country.

Cost of liquidity: These are indicators of the average cost that the banking sector has to pay to raise short-term liquidity. They are closely linked to banks' health and the aggregate funding conditions in markets.

Corporate bond spreads (aggregate average): An indicator of credit quality for the economy at large and a point-in-time measure of (credit) risk. Periods of boom are typically characterized by spreads that are lower than their average levels, while periods of stress are often marked by rapidly widening spreads.

Drehmann`s and Borio`s (2010) analysis showed that the best variables to signal the pace and size of the *build-up* of the buffers differ from those that provide the best signals for their *release*. Credit, ensured by the deviation of the credit-to-GDP ratio from its trend, emerges as the best variable for the build-up phase, as it has the strongest leading indicator properties for financial system distress. A side benefit of using this variable as the anchor is that it could help to restrain the credit boom and hence risk taking to some extent.

For a top-down approach, the analysis shows that the best variables as signals for the pace and size of the accumulation of the buffers are not necessarily the best for the timing and intensity of the release. Credit seems to be preferable for the build-up phase. In particular when measured by the deviation of the credit-to-GDP ratio from its trend, it has proven leading indicator properties for financial distress. The corresponding data are also available in all jurisdictions, in contrast to other variables, such as CDS spreads.

According to Drehmann and Borio (2011), the variable that performs best as an indicator for the build-up phase is the gap between the ratio of credit to GDP and its long-term trend (the credit-to-GDP gap).

The credit-to-GDP gap, however, is not a reliable coincident indicator of systemic stress in the banking sector. In general, a prompt and sizable release of the buffer is desirable. Banks would then be free to use the capital to absorb write-downs.

Repullo and Saurina (2011) in their analysis also make clear that any operational framework would need to incorporate an element of judgment, especially in the release phase. As in other fields of economic policy, rules provide invaluable discipline but may not work well in all circumstances.

Given the relatively early stage in the economic analysis of the interactions between the real and financial sectors of the economy, it would be premature to claim that any rule can be sufficiently robust across countries and time. Moreover, the political economy of the design and application of macroprudential instruments, such as the countercyclical capital buffer, is a field in which much more analysis is needed.

The calculation methodology presented in the Credit/GDP guide includes the following steps to determine the credit-to-GDP ratio, its deviation from its long-term trend and the level of countercyclical capital buffer (BCBS, 2010):

1) *Calculating the credit-to-GDP ratio*

$$\text{Ratio (t)} = \text{CREDIT (t)}/\text{GDP (t)} \times 100\% \quad (1)$$

CREDI (t) is a broad measure of credit to the private, non-financial sector in period t, while represents the Gross Domestic Product. Both are defined in nominal terms for year t, and national authorities are advised to calculate this ratio on a quarterly basis.

2) *Calculating the credit-to-GDP gap*

In this phase the credit-to-GDP ratio is compared to its long term trend, this being equal to GAP. If there is a large positive gap, namely the credit-to-GDP ratio is significantly above its trend, this may denote that credit level in the economy may exceeded the economy's growth rate. The GAP (t) in period t for each country is calculated as the actual credit-to-GDP ratio, minus its long-term trend *TREND(t):*

$$GAP\ (t) = RATIO\ (t) - TREND\ (t) \tag{2}$$

Where TREND (t) is an approximation of the average of the credit-to-GDP ratio, based on the historical values of each economy. The Hodrick-Prescott filter was used to smooth the series, because it has the advantage that recent observations are given higher weights. The Hodrick-Prescott filter is a methodology of decomposing the observed series, to separate the cyclical component of a time series. It seeks to extract from the series, the trend τt, and its cyclical component, ct, $yt = \tau t + ct$, where the cyclical component is the difference between the original series and its trend, τt is a trend component that will minimize the expression:

$$\sum_{1}^{T} (y(t) - \tau(t))^2 + \lambda \sum_{2}^{T-1} [(\tau(t+1) - \tau(t)) - (\tau(t) - \tau(t-1)]^2 \tag{3}$$

The first term of the sum represents the y (t) squared deviations from trend τt. The second terms contains λ, and measures the sum of the squares of the trend component's second differences. This second term penalizes variations in the growth rate of the trend component. The larger the value of λ, the higher is the penalty. The Committee suggest a value for λ of 400,000, since they consider that this is an appropriate value to capture the long-term trend in the behaviour of the credit/GDP ratio.

3) *Transforming the credit-to-GDP gap into the guide buffer add-on*

According to BCBS additional capital, or the buffer add-on (VBt), which is expressed in percent of risk-weighted assets, is zero when theis below a certain threshold, L. When varies between the minimum and the higher threshold, H, then it will be equal to its variation, and when exceeds H, the buffer will be equal with the maximum level, VBmax. So the lower and upper thresholds L and H represent the key point in determining the timing, and the speed of the adjustment of the buffer add-on. The Committee suggests L = 2 and H = 10, considering that these may represent an optimal level, even though they depend to some extent the choice of smoothing parameter (λ), the length of both series. A threshold of L-2 means:

$$((CREDIT\ (t)/GDP\ (t)) \times 100\%) - (TREND(t)) < 2\% \tag{4}$$

and the buffer add-on in this case will be zero, while a threshold of 10 means H:

$$((CREDIT\ (t)/GDP\ (t)) \times 100\%) - (TREND(t)) > 10\% \tag{5}$$

where the buffer add-on will be at its maximum level, namely 2.5% of risk-weighted assets.

According to Trenca (2011), BCBS points out that the credit-to-GDP ratio and its long-term trend are powerful signals of banking crises. The Committee therefore recommends that the authorities carefully choose thresholds, and the levels of L and H are only a recommendation. So L should be low enough, so that banks have time and the ability to build up capital before a potential crisis. As banks are given one year to raise additional capital, this means that the indicator should signalize the crisis at least 2–3 years before. At the same time L should be high enough, so

that no additional capital is required during normal times. For H, at which point no additional capital would be required, even if the gap would continue to increase, should be low enough, so that the buffer would be at its maximum prior to major banking crises.

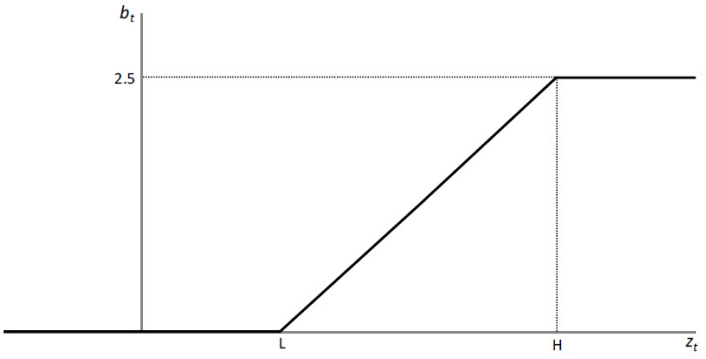

Fig. 1. Relationship between the countercyclical capital buffer and credit-to-GDP gap

3. Countercyclical capital buffer in Baltic States

The methodology developed by Basel III and described above to mitigate the pro-cyclicality and minimize system wide risk by establishing a countercyclical capital buffer is applied to Estonia, Latvia and Lithuania during the time period of 2000–2012. Even though the Basel Committee recommends using quarterly calculations, the derived numbers do not produce consistent results because of hyper fast growth and seasonal volatility of GDP. Therefore annual data of the Credit and GDP series are analyzed. As Fig. 2 shows for Latvia, with the assistance of the Hodrick-Prescott filter, it is possible to figure out the long-term trend of the Credit to GDP ratio. Anytime the actual ratio goes above the trend, a gap is identified, which is expected to trigger the start of establishment of the counter-cyclical capital buffer.

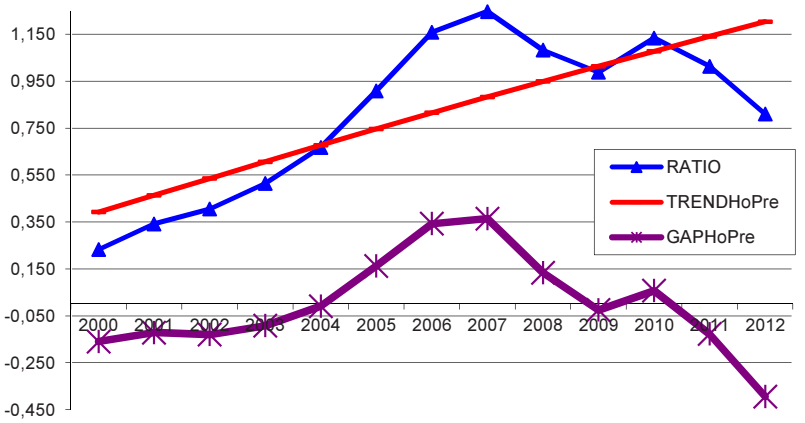

Fig. 2. Credit to GDP ratio, long term trend and GAP for Latvia

However, as pointed out in the theoretical part of the paper, the credit growth can be a better alternative for estimating the amount of capital buffer needed than Credit to GDP ratio. Additionally, authors take into consideration the recommendation of the Basel Committee to establish a capital buffer within one year of first

signals to do so while the capital buffer can be released immediately after receiving corresponding signals. Obviously, in case of Latvia the Credit growth methodology leads to both establishment and release of the countercyclical buffer about one year earlier. These findings are incorporated in the Fig. 3.

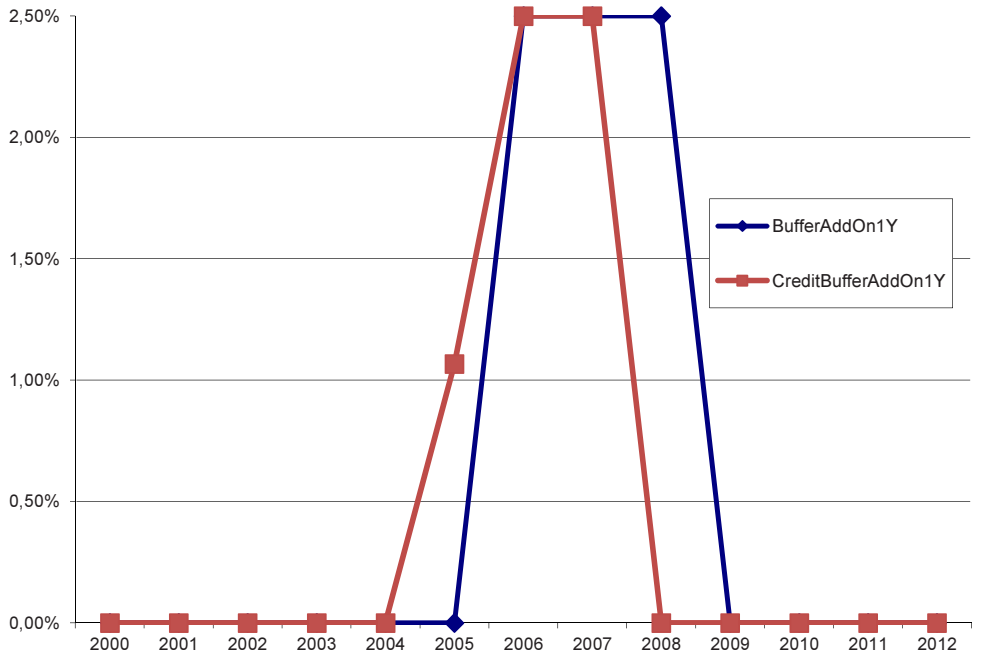

Fig. 3. Credit to GDP and Credit growth buffer add on with one year delay for Latvia

Thus, by implementing the rule of one year delay in case of Latvia, the period of establishment of the capital buffer gets one year shorter and eliminates the necessity to establish a capital buffer in 2010 in accordance with the Credit to GDP methodology. The findings also suggest to establish the capital buffer exactly at the time when economy overheating risks were widely recognized in Latvia, but were not properly addressed. Provided that Latvian GDP started to decline in 2009, the Credit growth methodology can be considered to be more appropriate for the case of Latvia since it suggests releasing the buffer already in 2008, which potentially might have mitigated the GDP decline.

Furthermore, annual data of the Credit and GDP series are analyzed also for Estonia and Lithuania. The Fig. 4 shows the actual ratio of the Credit to GDP versus its long-term trend for Estonia. The fluctuations of these indicators for Estonia are substantially smaller than in case of Latvia because of less volatile GDP and credit growth.

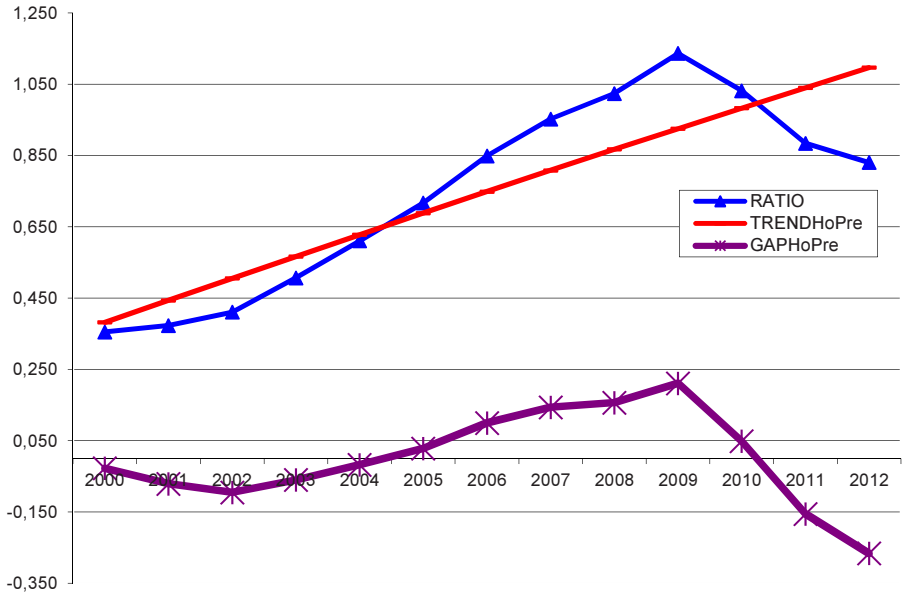

Fig. 4. Credit to GDP ratio, long term trend and GAP for Estonia

Logically, it should leave a smaller impact on capital buffer establishment decisions. To test that, counter-cyclical capital buffer estimates are prepared by following the same rules as they were in case of Latvia. To proceed with the analysis, one year delay for establishment of the capital buffer is introduced. The findings are shown on the Fig. 5, which suggest that in Estonia the establishment of the capital buffer should have started in 2004 as in contrast to Latvia, which signals appeared in 2005 while the capital buffer release should have occurred in 2008 for both countries. In contrast to Latvia, initial symptoms to establish the capital buffer occurred already in 2004, when the estimated amount of capital buffer needed as around 1.5%.

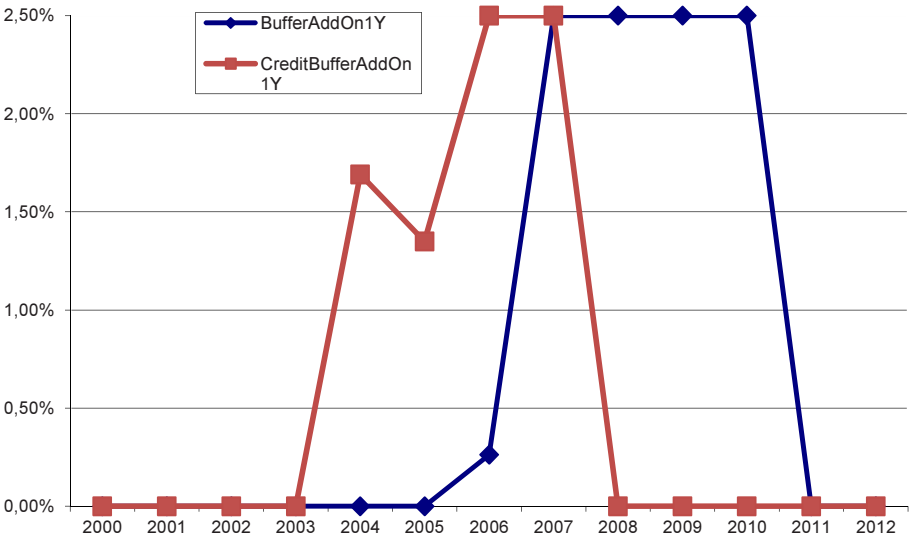

Fig. 5. Credit to GDP and Credit growth buffer add on with one year delay for Estonia

Interestingly, that there is a much wider gap between capital buffer estimates prepared by the Credit growth and Credit to GDP ratio methodology in case of Estonia than in case of Latvia. Major difference is for capital release schedule, where there is only one year lag for Latvia and three year lag in case of Estonia.

Lithuania constitutes a bit different case. The main difference compared to Latvia or Estonia is a much smaller proportion of credits to GDP. It is quite obviously seen from the long-term credit to GDP trend, which does not exceed 0.75 for Lithuania in 2012 while the same indicator exceeds 1.15 for Latvia and is around 1.15 for Estonia. The Credit to GDP ratio, long-term trend and GAP for Lithuania are shown on the Fig. 6.

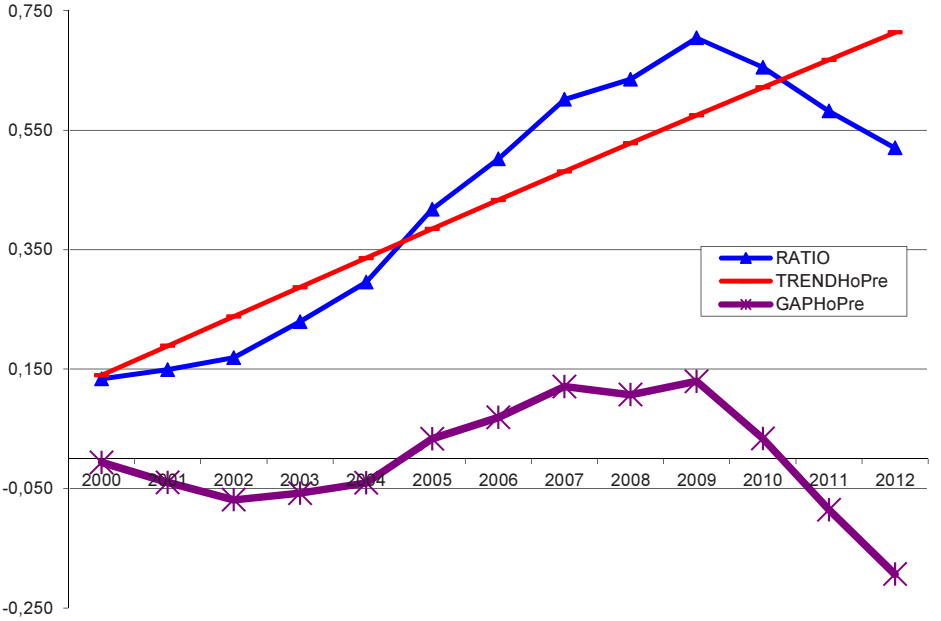

Fig. 6. Credit to GDP ratio, long term trend and GAP for Lithuania

Nonetheless a relatively low indebtedness of the Lithuanian economy still does not mean that different capital buffer decisions will be derived from the methodology described above. Since Lithuania enjoys low starting points for both, an absolute volume of credits and the credit to GDP ratio, both methodologies end up in clear decisions that countercyclical capital buffer is also needed. As in cases described above, estimates derived from the Credit growth methodology lead to a faster capital buffer establishment and its faster release, thus outpacing hyper fast growth or contraction in the economy.

If the Credit to GDP ratio and Credit growth methods are adjusted for the one year delay in the establishment of the capital buffer, then the buffer is expected to be established in 2004 and fully released in 2009, as suggested by the Credit growth methodology (see Fig. 7).

To sum up the analysis section, for all three Baltic countries Estonia, Latvia and Lithuania pro-cyclical capital buffer was needed to be established during fast expansion of national economies of these countries in 2003–2011. Moreover, the amount of the capital buffer required the most of the time was at the upper limit of 2.5%. It is quite important to mention that the countries of the research have different credits to GDP ratios where Latvia and Estonia can be largely placed in one group while Lithuania enjoys a much lower ratio or being much less indebted by credits. If a capital buffer establishment is allowed to be deferred by one year, the total period when such capital buffer is needed gets shorter. However, it was not the purpose of the analysis to find out the impact of such a condition on the economy.

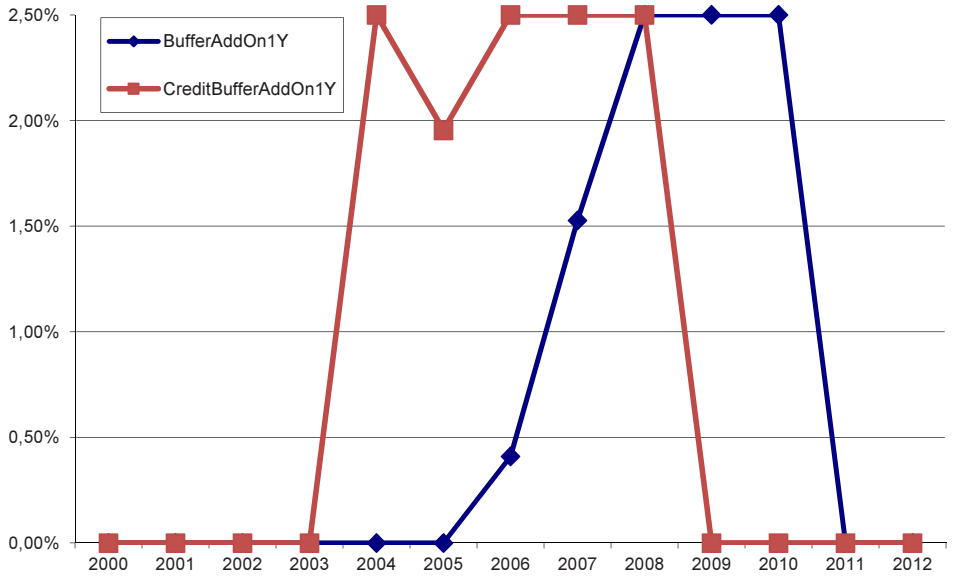

Fig. 7. Credit to GDP and Credit growth buffer add on with one year delay for Lithuania

The Credit growth method results in a faster establishment of the capital buffer compared to the Credit to GDP ratio because of a fast economic growth fuelled by credits.

The Credit growth method also results in a faster release of the buffer capital, thus in both terms outpacing the Credit to GDP method for the countries under the research. Logically, it might have had a better preventive impact on the economy of Estonia, Latvia and Lithuania if compared to the Credits to GDP ratio method, which was proved to lag behind. Statistical findings for the GDP growth and the GDP growth gap and credit growth and the credit growth gap for Estonia, Latvia and Lithuania are shown in the Table 1:

Table 1. Correlation between credit growth, GDP growth and corresponding gaps for Estonia, Latvia and Lithuania

Correlation parameter	Estonia	Latvia	Lithuania
GDP growth and gap	–0.29	0.45	–0.10
Credit growth and gap	0.71	0.57	0.77

There is major positive correlation found between credit growth and credit growth gap for all countries, which suggests that the methodology enables identifying a positive gap at good times and negative gap at bad times. The statistical findings for correlation between GDP growth and GDP growth gap is both statistically weak (i.e. ranging from –0.29 to 0.45) and not consistent being positive for Latvia and negative for Estonia and Lithuania. Thus, it brings an implication that the credit growth methodology is capable of providing estimates, which can mitigate the credit cycle effects while there is not such evidence for the GDP growth approach.

Suggested proposals for further research include a comparison of the Credit growth and Credit to GDP ratio methodologies by studying other countries, figuring out an impact on the economy of a condition to defer an establishment of the capital buffer by one year and whether adjustments to methodologies are needed in case countries have substantially different credits to GDP ratio, as the Lithuanian example clearly stands out.

4. Conclusions

We have assessed the countercyclical capital buffer, focusing our discussion on the proposed common reference point for taking buffer decisions, which is the difference between the aggregate credit-to-GDP ratio and its trend (the credit-to-GDP gap) as well as adding an alternative methodology of credit growth and a corresponding gap. For all three Baltic countries Estonia, Latvia and Lithuania pro-cyclical capital buffer was needed to be established during fast expansion of national economies of these countries in 2003-2011. The amount of the capital buffer required the most of the time was at the upper limit of 2,5%.

The Credit growth method results in a faster establishment of the capital buffer compared to the Credit to GDP ratio because of a fast economic growth fuelled by credits. The Credit growth method also results in a faster release of the buffer capital, thus in both terms outpacing the Credit to GDP method for the countries under the research. Logically, it might have had a better preventive impact on the economy of Estonia, Latvia and Lithuania if compared to the Credits to GDP ratio method, which was proved to lag behind. There is major positive correlation found between credit growth and credit growth gap for all countries, which suggests that the methodology enables identifying a positive gap at good times and negative gap at bad times.

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