
**FINANCIAL STABILITY AND MACROPRUDENTIAL OVERSIGHT DEPARTMENT**

P O Box 2882, Windhoek, Namibia

Tel: +264-61-283 5111

Fax: +264-61-283 5067

**E-mail: Financial.Stability@BON.COM.NA**

Citations should refer to an Occasional paper of the Bank of Namibia. The views expressed are those of the author(s) and do not necessarily represent those of the Bank.

# Implementation of the Countercyclical Capital Buffer (CCyB) using Credit-to-GDP gap: The Namibian Perspective

***Victoria Manuel,*** *Bank of Namibia; e-mail: victoria.manuel@bon.com.na*

***Andy Esterhuizen,*** *Bank of Namibia: e-mail: andy.esterhuizen@bon.com.na*

***Sabina Mufika,*** *Bank of Namibia: e-mail: sabina.mufika@bon.com.na*

***Anna William,*** *Bank of Namibia: e-mail: anna.william@bon.com.na*

***Florette Nakusera,*** *Bank of Namibia: e-mail: florette.nakusera@bon.com.na*

**BON Occasional Paper: OP1- 2023**

© Copyright of the Bank of Namibia, Financial Stability and Macroprudential Oversight Department 2023.

All rights reserved. No part of this publication may be reproduced, copied or transmitted in any form or by any means, including but not limited to photocopying, recording and storing, without fully acknowledging this paper as the source. The contents of this publication are intended for general information only and are not intended to serve as financial or other advice. While every precaution is taken to ensure the accuracy of information, the Bank of Namibia is neither liable to any person for inaccurate information nor for any opinion contained in this publication.

Published by the Financial Stability and Macroprudential Oversight Department of the Bank of Namibia. Enquiries related to this publication should be directed to: The Director of the Financial Stability and Macroprudential Oversight Department.

P O Box 2882

WINDHOEK

NAMIBIA

Tel: +264 61 283 5111

Fax: +264 61 2835067

E-mail: financial.stability@bon.com.na

http://www.bon.com.na

## *Abstract*

*The study examined the implementation of the Countercyclical Capital Buffer (CCyB) in Namibia through the analysis of the credit-to-GDP gap, using the Hodrick-Prescott (HP) filter and quarterly data from 1992 to 2022. The study identified four positive gaps above the trendline, indicating the need for additional capital buffers during periods of high credit growth, while other gaps showed values below the trendline, indicating a relaxation of the buffer. The study effectively calibrated the practical example of buffer add-ons of positive gaps exceeding 2 percent and assigning a buffer add-on of 0 percent for gaps below 2 percent. Overall, the study suggests that implementing the CCyB based on credit-to-GDP ratios is feasible for Namibia. However, it emphasises the need to complement buffer add-on decisions with the assessment of other key macro-financial indicators due to shortcomings associated with the HP filter methodology. The analysis serves as a stress indicator and aligns with Basel III's recommendations for buffer add-on modifications. The key recommendations for Namibia include continuous evaluation of the key indicator and a gradual phased-in implementation of the CCyB, developing a framework defining its scope and operation, as well as benchmarking against international best practices. Timely and adequate calibration, considering the economic environment and recent threats, is therefore crucial. For an effective policy framework, it is recommended that both stakeholders and experts from the financial and regulatory sectors be engaged.*

## Contents


1. Background ..... 5
2. Introduction ..... 5
3. Implementation of the CCyB across the globe ..... 6
4. Objectives ..... 8
5. Theoretical Literature ..... 9
6. Methodological Approach ..... 15
7. Results ..... 17
   - 7.1. The credit-to-GDP ratio ..... 17
   - 7.2. The credit-to-GDP gap ..... 19
   - 7.3. Calculating the countercyclical buffer add-on ..... 19
   - 7.4. End of Sample Problems ..... 21
8. Conclusion ..... 23
9. Recommendations ..... 24

References ..... 26

Annex ..... 28

## 1. Background

**The Global Financial Crisis (GFC) of 2007-2008 exposed common flaws in the global financial regulatory framework, which resulted in the financial crisis.** The Basel Committee on Banking Supervision (BCBS), being the primary global standard setter for the prudential regulation of banks, provided a diagnosis of these flaws in the global regulatory framework and pointed out three key issues. These included the insufficient quantity and quality of capital to absorb unexpected losses; insufficient buffers of liquid assets to handle funding crises, resulting in the system failing to absorb the systemic credit losses as well as reintermediation of large off-balance sheet exposures. Lastly, the financial crisis was further exacerbated by a procyclical deleveraging process and by a system that had become globally too interconnected with complex transactions, (BCBS, 2011; Barwell, 2017).

**The aftermath of the GFC has prompted reforms of the global financial regulatory architecture in which new standards, tools, and practices are increasingly being developed and implemented across the globe.** The BCBS, through Basel III, introduced reforms that aim to strengthen the regulation, supervision, as well as risk management, that could enhance the global banking sector resilience. The Basel III, announced and endorsed in 2010, is a global regulatory framework for resilient banks and banking systems, which outlines details of global regulatory standards on banks' capital adequacy and liquidity. The Basel III reforms were, therefore, intended to address the flaws in the regulatory framework and strengthen the resilience of financial systems, especially those experienced during the GFC. It further strengthened the micro-prudential regulation, supervision, and added a macroprudential overlay that includes capital buffers such as the CCyB, that could be built in good times and be released in times of stress to limit procyclicality shocks on the banking system, (BCBS, 2010).

## 2. Introduction

**The CCyB is an additional capital requirement that banks need to build during economic expansion when credit is growing rapidly, on top of the existing capital adequacy requirements.** The CCyB varies within the range of 0-2.5 percent, which is applied to the banks' risk weighted assets (RWA), based on the direction and judgement of systemic risk (BCBS, 2010). The buffer acts as an additional capital requirement that guards the banking institutions against periods of excessive credit expansion, which are frequently linked to the accumulation of systemic risk. In addition, the CCyB can be used as a tool to counter the slowdown in lending during an economic recession, as it builds banks resilience by

enabling them to continue extending credit to the economy without disruptions. Thus, the CCyB as a macroprudential policy tool guarantees that capital requirements for the banking sector consider the macroeconomic context in which they operate, ensuring that the flow of credit is not constrained by weak macroeconomic fundamentals, (Flamini, *et al.* 2019).

**The main distinctions among capital adequacy, capital conservation buffer, and the CCyB lie in their respective designs aimed at achieving various objectives**. However, they all share the common goal of enhancing a bank's ability to withstand shocks. Both the capital conservation buffer and the countercyclical capital buffer are forms of capital reserves that banks must maintain alongside minimum capital requirements. Nevertheless, these two buffers serve distinct purposes and possess unique characteristics. The minimum capital adequacy, Capital Conservation Buffer (CCB), and the CCyB are all capital requisites introduced as part of Basel III to enhance the banking sector's regulatory framework by bolstering its resilience. These measures are macroprudential tools crafted to address systemic risks arising from interconnections and cyclical patterns within the banking sphere. While the minimum capital adequacy ratio and the CCB aim to shield individual banks from potential exposure to common systemic risks, the CCyB supplements these two (minimum capital adequacy ratio and CCB) by safeguarding the banking sector against cyclical risks (Onal and Yetkin, 2019). The implementation of the CCyB as a macroprudential policy empowers financial institutions to absorb shocks while mitigating fluctuations in the financial and economic cycles. This signifies that the capital accumulated during an economic upswing characterised by excessive credit expansion can be utilised to counteract the contraction caused by credit reduction during a downturn. This dual function promotes both financial stability and economic activity, (BIS, 2019).

## 3. Implementation of the CCyB across the globe

**In terms of application, over 28 countries are currently implementing the CCyB in their respective jurisdictions.** Given that the CCyB is a relatively new macroprudential policy tool, the number of countries that implemented it prior to the pandemic was low; however, several countries have shown interest in recent times. To date, over 28 countries mostly from the Advanced Economies (AEs) and Emerging Markets Economies (EMEs) have announced and or have CCyB's in place. These countries include the United States (US), United Kingdom (UK), South Africa (SA), Canada, Australia, Russia, India, Singapore, Japan, the Netherlands, and Germany, just to mention a few (BIS, 2022). Countries such as Sweden and Norway launched and implemented the CCyB above 1 percent as early as 2014 and 2015,

respectively. Many other countries launched their CCyB but kept it at 0 percent, with a couple of them having increased their buffers since 2018. To the authors knowledge, the implementation of the CCyB in many developing economies, especially in Africa, has however been very low to none, except for South Africa.

**Moreover, several central banks across the world have begun increasing their CCyB.** Since 2018, several countries in Europe set their respective CCyB's in the range of 0.25 to 1.5 percent. The adjustment to increase the CCyB was mostly based on a guided discretion, combining key risk indicators and discretionary indicators reflecting specific economic and financial conditions in respective economies. The credit-to-GDP ratio was assessed to be below the set benchmark of 2 percent, which is also a guiding indicator to activate the buffer[1]. Some countries based their buffer calibrations on a forward-looking risk assessment, while others looked at the financial and or credit cycle. In addition, other factors that were also considered were the developments in the financial sector, such as the strengthening upturn in the financial cycle and an increase in credit (Babic and Fahr, 2023). The Federal Reserve and the South African Reserve Bank (SARB), for example, chose to maintain their respective CCyB's at 0.0 percent (Table 1).

**Table 1: Macroprudential policy tools in Namibia and CCyB across a few selected jurisdictions**

| Country | Tool | Description | Comment |
|---|---|---|---|
| Namibia | LTV[2] | • 20% for every subsequent property in 2017. | • Relaxed to 10 percent for every subsequent property in 2019.<br>• Further relaxation in 2023 to 100 percent for first non-primary residential property and 90 percent for all subsequent non-primary properties. |
| Namibia | CCB[3] | • Was at 1 % prior to Covid-19.<br>• Currently at 0%. | • Was in full use before Covid-19 but released as relief measure during the pandemic. |
| South Africa | CCyB | • Since 2016: 0%. | • Based on overall economic conditions not just credit developments. |
| Ireland | CCyB | • Current applicable rate: 0%.<br>• Rate applicable from 15 June 2023: 0.5%. | • Largely based on credit developments. |

[1] *Activation:* During periods of economic expansion and excessive credit growth, banks are mandated to set aside a portion of their capital to create a buffer that can absorb potential losses during economic downturns.

[2] Loan-to-Value (LTV)

[3] Capital conservation Buffer (CCB)

| | | | |
|---|---|---|---|
| | | • Rate applicable from 24 November 2023: 1.0%. | |
| Estonia | CCyB | • Rate applicable 2016 – 2022: 0%.<br>• Current rate since Jan 2023: 1 % | • Largely based on credit developments. |
| Cyprus | CCyB | • The CCyB increased from 0% to 0.5% in December 2022.<br>• On 1 April 2023, the CCyB remained unchanged at 0.5%. | • Largely based on credit developments. |
| Croatia | CCyB | • Since 2015: 0 %<br>• December 2022: 0.5% - 1%.<br>• Announced: 1.5% Effective December 2023 | • Largely based on credit developments. |
| Slovenia | CCyB | • Since 2015: 0%<br>• December 2017: 0.5% - 2.%.<br>• Current rate 1.5%. | • Largely based on credit developments. |
| France | CCyB | • 1 April 2023: 0.5% -1%. | • Based on overall economic conditions not just credit developments. |
| USA | CCyB | • Dec 2020: 0.0%.<br>• No expected change. | • Based on overall economic conditions not just credit developments. |
| UK | CCyB | • Dec 2020: 1.0%.<br>• July 2023: 2.0%. | • Based on overall economic conditions not just credit developments. |

Source: Various central banks

## 4. Objectives

**The Bank of Namibia (the Bank) is the only institution mandated to oversee the macroprudential policy in the country and implementation of these policies in Namibia has been gaining momentum.** Like other jurisdictions, the Bank has a choice of tools for financial stability and macroprudential policy surveillance. This includes tools such as capital adequacy requirements, liquidity ratios, LTV ratios, stress testing exercises, among others. With respect to capital adequacy, Namibia currently implements the CCB, which was built up to 1.0 percent prior to the Covid-19 pandemic. The buffer was released during the pandemic to cushion the impact of the pandemic on the financial system. In this regard, the financial system has remained stable, liquid and well capitalised throughout the pandemic, partly due to Covid-19 relief measures provided during the pandemic. The Bank removed the capital and liquidity-based relief measures, effective April 2023. As a result, the banking institutions were now expected to rebuild their CCB from 0 percent to 0.5 percent effective from the second quarter of 2023, as indicated in Table 1 above. Moreover, Namibia implements asset-based

macroprudential instruments, such as the LTV ratio, which is subject to revision based on macroeconomic conditions.

**Namibia has so far implemented various capital-based prudential tools but not the CCyB.** In terms of capital adequacy buffer requirements, the CCyB has become an instrument of increasing importance in the field of macroprudential policy, as it is paramount in cushioning the negative impact of an economic downturn on the banking system. In pursuit of a stable and resilient financial system, Namibia joins the CCyB growing interest and seeks to understand its efficacy, explore its features, scope, and feasibility, as well as its applicability to the Namibian banking institutions.

**The CCyB can be a valuable complement to monetary policy as it addresses systemic risks and encourages responsible lending practices within the banking sector.** Monetary policy aims to promote price stability while macroprudential policy aims to safeguard financial stability but both policies have different objectives and tools. These policies can have unintended consequences that spill over into each other's domains and warrants for clear separation of roles to avoid conflicts of interest. As such, it is important to ensure that these policies work in tandem to enhance the overall stability and health of both the financial system and the broader economy.

**The objective of the study was to assess the implementation of CCyB in Namibia using the recommended key indicator, the credit-to-GDP ratio**. The implementation of the CCyB in Namibia is examined by assessing the main CCyB policy tool indicator, the credit-to-GDP ratio for the financial system. The study aims to determine whether the credit-to-GDP gap, proposed by the BCBS (2010) truly provide insights of measuring systemic risks in Namibia, specifically focusing on periods of excess credit growth. The study further demonstrates how buffer add-on can be calibrated in real time.

## 5. Theoretical Literature

**The theoretical foundation of the CCyB is based on the Basel III, "a global regulatory framework for more resilient banks and banking systems" (BCBS, 2010).** Due to the shortcomings with the Basel I and II, which was evident during the GFC, an additional macroprudential policy to address cyclical related systemic risks was introduced in the Basel III. The rationale behind a cyclical macroprudential tool such as the CCyB, is based on the economic understanding that during an economic boom, credit tends to grow faster and as a

result, risks tend to accumulate during these times and may only distort the banking sector at a later stage, mostly during the time of economic distress. Building capital buffers that are adequate to cushion the effects of credit contractions during a recession is one way to contain cyclical systemic risks while also maintaining financial and economic stability (Drehmann *et al.* 2010).

**There are various CCyB tools; however, the most consistent internationally used buffer guide and the starting point for setting up the buffer decision is the credit-to-GDP gap**. The BCBS (2010) provides the guiding principles for setting the CCyB, which emphasises the role of the credit-to-GDP gap as an important indicator for the CCyB operation. According to the BIS (2017), the aggregate private sector credit-to-GDP gap is recommended for use as a good measure of systemic risk. This is preferred over other indicators as it directly relates better with the objective of the CCyB of cushioning the banking institutions from systemic risks associated with high credit growth (BCBS, 2010). Moreover, Drehmann *et al.* (2010) added that, when using the deviation of credit-to-GDP ratio from its long term trend, credit proved to be the most useful leading indicator for financial distress compared to other financial indicators.

Below are the three steps to calculate the buffer add-on as prescribed by the BCBS (2010) guide.

**Step 1: Calculate the aggregate private sector credit-to-GDP ratio.**

The credit-to-GDP ratio in period *t* for each country is calculated as:

$$Ratio_t = \frac{credit_t}{GDP_t} * 100\%$$

$GDP_t$ is defined as the nominal gross domestic product and $credit_t$ is the broad measure of credit in period *t*.

**Step 2: Calculate the credit-to-GDP gap (the gap between the ratio and its trend).**

The credit-to-GDP gap is the deviation of the stock of credits to gross domestic product (GDP) from its long-term trend, expressed as a percentage value. According to the BCBS (2010) guide, “if the credit-to-GDP ratio is significantly above its trend, this in essence signals a positive gap and is an indication that credit may have grown excessively relative to GDP”.

In this case, the gap (GAP) in period *t* is measured as the difference between the actual credit-to-GDP ratio and its long-term trend (Trend), illustrated as follows:

$GAP_t = Ratio_t - Trend_t$

**The Hodrick-Prescott (HP) filter is recommended methodology to calculate the trend, and therefore the gap.** The BCBS (2010) views the trend as "a simple way of approximating a sustainable average ratio of credit-to-GDP based on the historical experience of the given economy". It proposes using the well-known HP filter (Hodrick and Prescott, 1997) to provide an estimate of the trend. The HP filter is preferred over the simple moving average and linear time trend as it allocates higher weights to more recent observations, which is more useful to effectively deal with structural breaks. This was supported by Drehmann and Yetman (2018) who concluded that the credit gap, which is the deviation of the credit-to-GDP ratio from a HP filtered trend, performed better compared to other gaps[4] in terms of crisis prediction. Hence the conclusion that the credit-to-GDP ratio is a powerful and preferred early warning indicator for predicting crises. In addition, Jokipii, Nyffeler and Riederer (2021), also found the credit-to-GDP gap to be a reliable indicator for credit measurement in Switzerland and recommended it for use when complimented with other credit metrics.

**Step 3: Transform the gap into buffer add-on.**

The size of the buffer add-on ($\mathrm{VB}_t$) is zero when the $GAP_t$ obtained in step two is lower than the lower threshold (L). The $\mathrm{VB}_t$ moves up with the $GAP_t$ until it gets to its maximum level ($VB_{max}$), which is the value when the GAP exceeds the upper limit (H).

The threshold measured by the lower (L) and upper (H) thresholds are the main key determining factors regarding the adjustment of the guide buffer add-on, (BCBS, 2010).

Based on historical banking crises events, the BCBS (2010) guide recommends an adjustment of a lower threshold of L=2 and an upper threshold of H=10. In this case, the reasonable specification is:

- The lower threshold setting L=2

$((\frac{credit_t}{GDP_t} * 100\%) - trend_t) \leq 2\%$ the buffer is below zero,

In this case, it indicates that the ratio is lower than trend, therefore the buffer add-on ($\mathrm{VB}_t$) should be set at 0%.

- Upper threshold setting of H=10

[4] Growth GDP gap, capita GDP gap, HP GDP gap, HP capita gap, projection GDP gap and projection capita gap.

$((\frac{credit_t}{GDP_t} * 100\%) - trend_t) \geq 10\%$ the buffer add-on is above its maximum

In cases where the ratio is above the trend, the buffer add-on ($\mathrm{VB}_t$) can be adjusted to its maximum rate of 2.5%.

However, when the ratio ranges between the lower and upper threshold of 2 and 10 percent, respectively, then the authority may similarly adjust the buffer linearly between 0% and 2.5% following the formular *(gap – 2) *(2.5/8)*[5], (BCBS, 2010).

**Recent studies have raised questions regarding the calculation of the gap.** The role of the credit-to-GDP gap as a key lead indicator for the CCyB rate decisions has recently been challenged, and the use of other indicators have gained more prominence. In support of this view, Edge and Meisenzahl (2011), and Farell (2014), both concluded that the credit-to-GDP gap was not a good indicator for the CCyB calibration, as it has measurement shortcomings, mainly those associated with the HP filter methodology such as the end-of-sample problem and end-point challenges. Hamilton (2017) opposed the use of a HP filter citing spurious dynamic relationship results. In defence, Hamilton (2017) recommends linear projections be applied instead of the HP filter. Farell (2014) was however, in support of the view that the credit-to-GDP ratio guide should not be the only leading indicator for CCyB adjustment but rather be accompanied by other indicators and judgement in the setting and deployment of the buffer.

**Countries should not be limited to the credit-to-GDP gap when assessing the credit conditions in the economy and its CCyB adjustment decisions.** In this regard, regulators are recommended to consider assessing other key macroeconomic indicators that are deemed relevant and may contribute to accumulation of cyclical risks. The authorities are equally advised to apply judgment in assessing the level of systemic financial risk, before making a buffer adjustment. Drehmann *et al.* (2010) pointed out that variables used to accumulate and build the buffers may not exactly be the best for the release of the buffer, in this regard, the study suggested that the credit-to-GDP ratio would be more suitable for the buffer build-up phase, while measure of aggregate losses complimented with other credit conditions indicators proved to be a good signal for the release of the buffer.

**Lately, several countries are opting to use a range of indicators to inform the buffer decision**. The BCBS (2010) proposed various macro financial indicators to complement the

5 The CCyB is gradually calibrated (increased or decreased) based on the severity of the gap within the specified range. It suggests that the buffer rate is directly proportional to the magnitude of the gap.

buffer decision (Table 2). Ireland for example announced the CCyB rate on exposures to be increased from 0% to 1% effective from July 2019, despite the credit-to-GDP gap being negative. The concept of a neutral[6] CCyB is similarly becoming very popular. A positive neutral rate for the CCyB is currently implemented in Lithuania since the end of 2017, Estonia since the end of 2021, as well as Ireland, Cyprus, and the Netherlands since 2022 (Behn, Pereira, Pirovano and Testa, 2023). Other authorities such as England are also on a path of keeping the CCyB rate above zero when risks are judged to be neither subdued nor elevated (Bank of England, 2023). Moreover, the SARB is also in the process of assessing the implementation of a neutral rate.[7]

**Table 2: Key indicators to be considered as outlined by BCBS (2010)**

| Indicators | Variables |
|---|---|
| Aggregate macroeconomic | GDP growth, (real) credit growth and deviations of the credit-to-GDP ratio from a long-term trend, deviations of real equity prices as well as real property prices from their respective long-term trends. |
| Banking sector performance | Profits (earnings), proxies for (gross) losses, proxies for the cost of funding in the form of credit spreads, etc. |

Source: BCBS (2010)

## 5.1. Empirical Literature

**Emperical evidence proved that the CCyB was an appropriate instrument to mitigate the macroeconomic and systemic risks for Turkey.** Yildirm (2021) analysed the relationship between the CCyB performance and risk indicators of the banking sector. The study closely looked at the association between the quarterly data obtained over the period 2007 to 2020 for Turkey and the CCyB proposed within the framework of Basel III, with banking performance and risk indicators. It was determined that the CCyB had a direct relation with the capital adequacy indicators of the banks in the long-run, although an indirect relationship with the asset quality risk and currency risk indicators was established. In addition, a positive relation was found in the short run between the CCyB and capital adequacy, profitability as well as liquidity indicators. With regard to causality, the study revealed that a unilateral

[6] A neutral CCyB refers to the idea that the CCyB would be set at a rate other than zero in a normal or standard risk environment (O'Brien et al. 2018).
[7] The SARB, Financial Stability Review (FSR), first edition, 2023.

causality from the indicators of capital adequacy, asset quality and exchange rate risk to the CCyB existed. Yildirm (2021), views that the CCyB could be increased during periods when the performance indicators of the banking sector were high, and vice versa and was in support of the CCyB being an appropriate macroprudential tool to mitigate the macroeconomic and systemic risks for Turkey.

**A targeted sectoral CCyB, increased commercial lending, the cost of borrowing and charges in Switzerland.** To respond to the question of whether macroprudential regulations on residential lending does affect the commercial lending behaviour, Auer and Ongena (2016), identified the compositional changes in the banks supply of credit using variations in their holdings of residential mortgages on which the CCyB was imposed in 2012. Their investigation revealed that the introduction of the CCyB resulted into higher growth in commercial lending, particularly to the small firms. Similarly, the interest rates and fees charged to these firms increased. This finding was re-affirmed by their subsequent study Auer, Matyunina and Ongena (2022), which also concluded that additional capital requirements of the CCyB resulted in commercial banks increasing lending, in which the smaller and riskier businesses benefited the most; however, it contributed to higer borrowing costs.

**Dana (2018), supported the view that macroprudential policies such as the CCyB can potentially mitigate the imbalances in the financial sector that stem from procyclical credit growth.** To substantiate this, Dana (2018), used the Structural Vector Autoregression (SVAR) approach to evaluate macroprudential policy effects on credit growth in Indonesia. The results concluded that prudential policy tools such as the LTV were efficient in reducing credit growth but not procyclically. However, the CCyB, GWM[8] and Loan Deposit Ratio (LDR) macroprudential policy instruments were capable of procyclical credit mitigation. The study recommended the central bank to establish an early warning system in macroprudential policy and strengthen the CCyB, LTV instruments, Minimum Reserve Requirement and Loan Funding Ratio in capturing systemic risks from various sources.

**Further evidence on the effectiveness of the CCyB was corroborate by Faria-e-Castro (2021), who concluded that raising capital buffers during expansions contributes to a reduction of the frequency of crises by more than a half.** In a quantitative analysis of macroeconomic effects of the CCyB, Faria-e-Castro (2021), applied a non-linear DSGE[9] model with occasional financial crises, which was calibrated and combined with US data to

[8] Giro Wajib Minimum (Statutory Reserve Requirements).

9 Non-linear dynamic stochastic general equilibrium models.

estimate sequences of structural shocks. The study found that raising capital buffers during expansions can reduce the frequency of crises by more than half. This was supplemented by a quantitative application to the 2007-2008 financial crisis which showed that the CCyB in the range of 2.5 percent would have countered the 2008 financial panic, for a cumulative gain of 29 percent in aggregate consumption.

**Similalry, Yazdanpanah *et al.* (2021), established that the CCyB reduced the instability of the banking sector, contributing to more stable output, inflation, consumption, and investment.** Using the DSGE model applied to all three different capital requirements rules, Yazdanpanah *et al.* (2021), found that during a negative supply shock to the economy, the implementation of the CCyB reduced the instability of the banking sector in Iran and produced more stable output, inflation, consumption, and investment. Furthermore, the results suggested that the countercyclical capital rule that reacts to economic growth enhanced banking stability in Iran. While Karmakar (2016), found evidence that the countercyclical capital requirement tool helped to reduce volatility and raise welfare.

## 6. Methodological Approach

The credit-to-GDP ratio serves as a proxy for systemic risk, reflecting the build-up of credit and potential vulnerabilities in the banking sector. By using this indicator, the role of the CCyB in mitigating procyclicality and promoting financial resilience is further examined. The total private sector credit extension is used as an indicator for credit, while quarterly GDP was derived by using annual nominal GDP converted into quarterly for the period of 1992 to 2022. Data of the two indicators were collected within the Bank and the Namibia Statistical Agency.

**To estimate the gap, the study followed the BCBS (2010) guide and employed the HP filter technique, which helps to decompose the time series data into its cyclical and trend components.** The HP filter identifies periods of excessive credit expansion or contraction relative to the underlying economic growth. Furthermore, it effectively decomposes the credit-to-GDP ratio time series into its trend and cyclical components, by identifying deviations of the credit-to-GDP ratio from its long-term trend (gaps), which are essential for evaluating potential systemic risks and informing CCyB decisions. This approach allows the visualisation and assessment of periods of (credit booms or busts) excessive credit expansion and contraction relative to GDP, providing valuable insights into the potential buildup of systemic risks to the financial sector and the economy.

The BCBS (2010) proposes the use of the HP filter to provide an estimate of the trend. The HP filter methodology decomposes the series $Y_t$ into a $Trend_t$ as follow:

$$\text{Trend}t\sum t = \frac{1}{T}\sum_{t=1}^{T}(Y_t - Trend_t)^2 + \frac{\lambda}{T}\sum_{t=2}^{T-1}(Trend_{t+1} - 2Trend_t) + Trend_{t-1})^2$$

Where:

- *Yt* represents the observed data at time *t*,
- Trend*t* represents the trend component at time *t*,
- *T* is the total number of time periods in the data,
- $\lambda$ is the smoothing parameter term that determines the trade-off between fitting the trend to the data and smoothing out short-term fluctuations. Since the HP filter is a symmetric 2-sided filter, trend estimates at the end of the sample are mostly preliminary and are subject to revision as new data points become available.

**A Hodrick-Prescott (HP) filter with a smoothing parameter of 400,000, as proposed by the BCBS (2010) is used.** The choice of the one-sided HP filter was driven by the nature of the credit-to-GDP gap data, which is often available only up to the present time or with some lag. This filter is particularly suitable for real-time or quasi-real-time estimates, enabling the assessment of the credit cycle in a timely manner. The smoothing parameter of 400,000 was selected as per the BCBS (2010) guide, however, other parameters such as 1600, 125000, 25000 as cited in Farell (2014) can equally be applied. The smoothed trend provides valuable insights into the credit dynamics, helping to determine the appropriate calibration of the CCyB and enhance financial stability measures. This method makes it easier to evaluate the size and length of credit booms and is important to determine the CCyB add-on BCBS (2010).

**Additionally, the study complemented the HP-filter analysis with a qualitative assessment of country case studies.** The countries considered were the United Kingdom, New Zealand, Australia, Ireland, South Africa, Nigeria, and others. This mixed-method approach enhanced the robustness and validity of the findings, enabling a comprehensive evaluation of the feasibility of the CCyB policy in the context of Namibia's banking institutions.

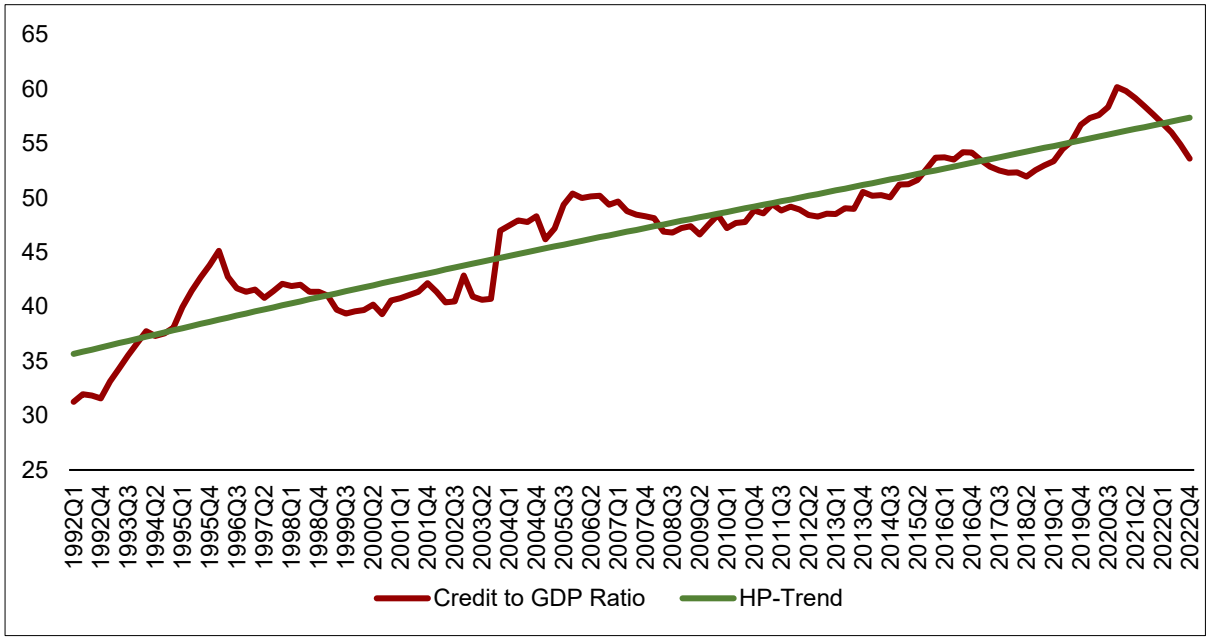
# 7. Results

## 7.1. The credit-to-GDP ratio

**Figure 1 presents the relation between the credit-to-GDP ratio and its trend, which provides valuable insights into the changing dynamics of credit and its relationship with economic growth.** Figure 1 shows two distinct lines representing the credit-to-GDP gap in Namibia over the period 1992 to 2022 on a quarterly basis. The straight-line labelled as *"trend"* depicts the long-term trend of the credit-to-GDP ratio. The curved line on the other hand, represents the actual movements and fluctuations of the credit-to-GDP ratio around this long-term trend. It is evident from Figure 1 that the credit-to-GDP ratio experienced deviations from its long-term trend, both in positive and negative directions. The difference between the credit-to-GDP ratio and its long-term trend is referred to as the "*gap",* which is displayed in Figure 2. Monitoring and understanding these trends is crucial for policymakers and financial regulators to make informed decisions regarding the CCyB.

**Overall, Figure 1 illustrates how the credit-to-GDP ratio in Namibia fluctuates over time, highlighting periods of divergence from its long-term trend, which is a crucial factor to consider when assessing the financial dynamics and potential risks in the economy.** The credit-to-GDP gap crossed above the trend in each of the four periods (1994Q4-1998Q4, 2003Q4-2008Q1, 2015Q3-2017Q1, 2019Q3-2022Q1), which denotes a transition from a credit contraction to a credit boom phase or a time of economic expansion. During these periods, Namibia's economic conditions such as GDP and other economic activity improved and resulted in increased demand for credit for both businesses and individual households, leading to a rebound in total credit growth (PSCE). This resulted in credit growth outpacing GDP growth, leading to a credit-to-GDP gap rising above the trend (Figure1). During these periods, both GDP and credit grew by 3.1-3.9 percent, 3.4-4.3 percent, 2.1- 2.5 percent and 0.7-0.7 percent, respectively. The crossing of the gap can be interpreted as a positive signal of economic recovery and heightened confidence in the financial system. However, if credit expansion becomes excessive and unsustainable, it is critical to be aware of the hazards that might result, including the creation of asset bubbles and financial imbalances. To strengthen the financial system's resilience and equip it for probable difficulties during economic downturns, regulatory authorities should carefully consider taking measures like creating buffers or activating the CCyB during this phase.

**Figure 1: Credit-to-GDP ratio and HP-filter trend**

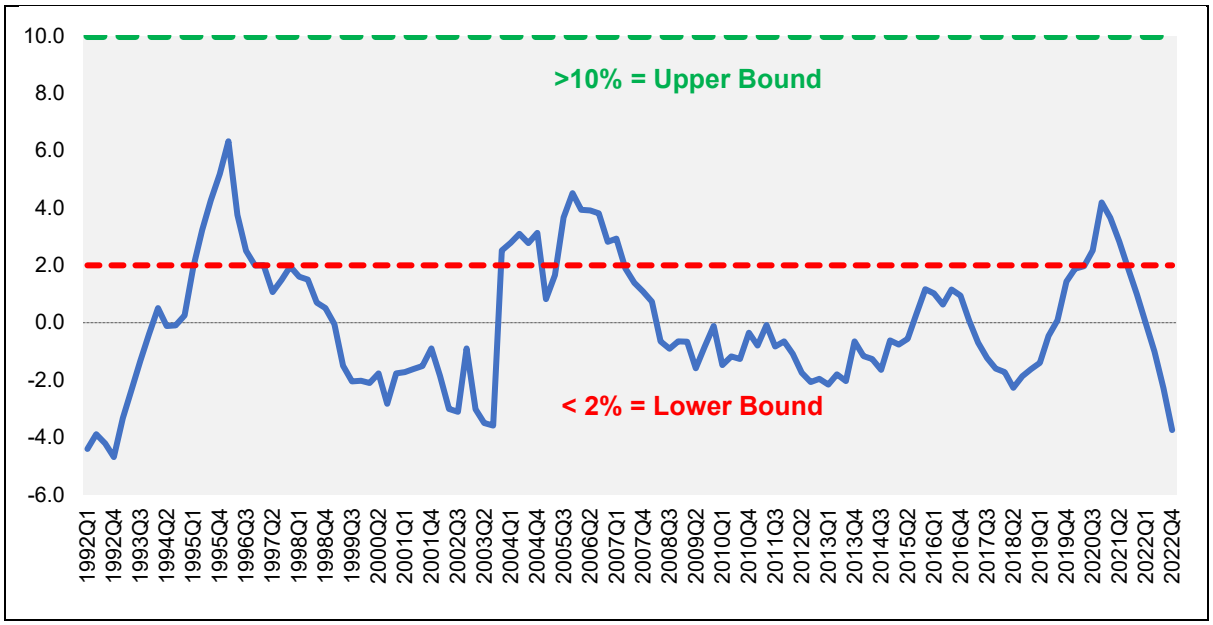



Source: Author's Own computations

**The credit-to-GDP gap was below the trend throughout the remaining time periods (Figure 1).** The periods between 1992Q1 to 1994Q3,1999Q1 to 2003Q3, 2008Q2 to 2015Q2, 2017Q2 to 2019Q2 and the current from 2022Q2 to date, credit-to-GDP gap crossed below the trend indicating a shift from a credit boom to a credit contraction phase. The crossing of the gap below the trend signals a moderation in credit growth and a potential cooling off of the economy such as a decline in general economic activity, increased unemployment and tightening of other macro-financial indicators (financial stress). During these periods, both the GDP and credit growth averaged 2.9-5.4 percent, 2.8-2.8 percent, and 2.7- 3.0 percent, 1.0-1.6 percent and 3.5- 1.1 percent, respectively. This is seen as a potential early warning sign of an economic slowdown or credit crunch, potentially due to tighter lending conditions, reduced demand for credit, or increased risk aversion by lenders and borrowers. During these periods, Namibia experienced slow growth in credit and slow economic growth. This could partly be attributed to the GFC, slow economic activity resulting in slow GDP growth and Covid-19 related challenges. During periods like these, the authority should consider monitoring the trend closely and, if necessary, releasing the CCyB to mitigate risks associated with potential credit contractions and their impact on financial stability.

## 7.2. The credit-to-GDP gap

**Figure 2: HP filter credit-to-GDP gap**

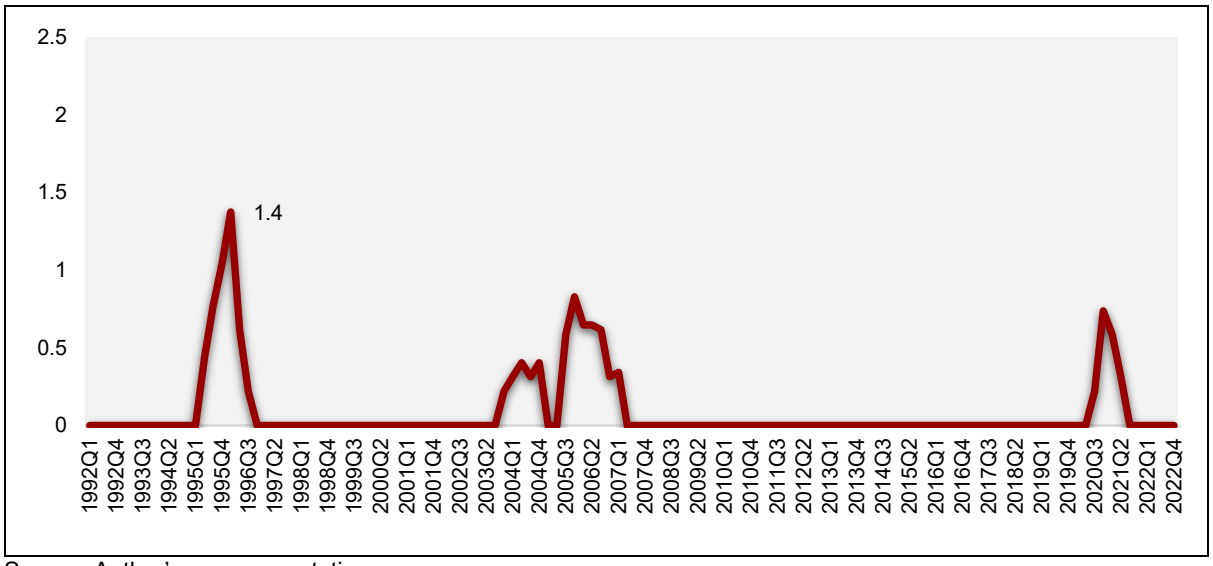



Source: Author's Own computations

## 7.3. Calculating the countercyclical buffer add-on

**Figure 3 shows how the macroprudential authorities adjust the buffer add-ons over time to respond to changing economic conditions and credit cycles in Figure 1 and 2.** The buffer guide suggests that a credit gap of 2 percent or less equates to a CCyB rate of 0 percent and a credit gap of 10 percent or higher equates to a CCyB rate of 2.5 percent. Higher buffer add-ons during the time of high credit growth or systemic risks demonstrate a proactive approach to ensure the stability of the financial system. Conversely, periods with zero buffer add-ons indicate that regulators might have considered the banking system to be sufficiently resilient during those times.

**Figure 3: CCyB Buffer add-on**

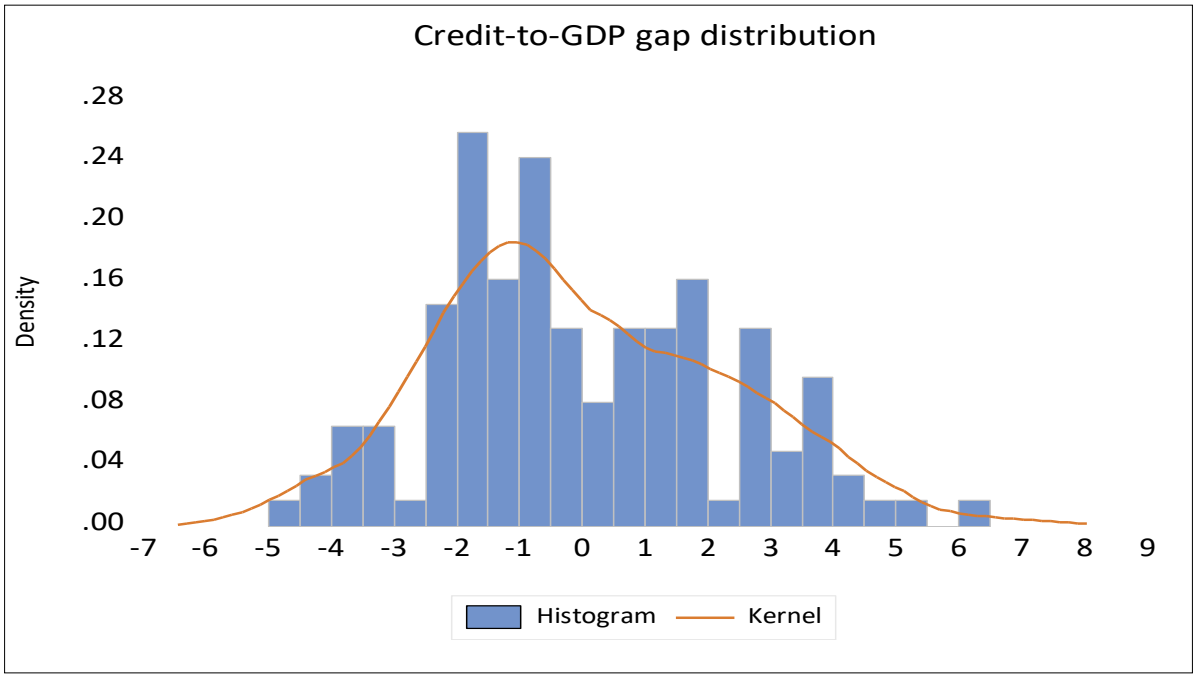



Source: Author's own computations

**Following the CCyB guide, the four periods of credit boom identified in Figure 1, is also known as the building phase, in this case the authority would activate a positive buffer add-on.** During times when the credit-to-GDP gap was more than 2 percent, the authority should apply the buffer add-on ranging from 0 to 1.5 percent. This measure is taken to ensure that banks maintain an additional capital buffer to counteract potential risks arising from excessive credit growth and potential systemic imbalances. Conversely, during the time when the credit-to-GDP ratio is below 2 percent, the buffer add-on would be kept at 0 percent. This indicates that macroprudential authorities do not perceive any significant systemic risks or credit imbalances that require additional capital requirements during those times to necessitate the activation of the CCyB. The absence of additional capital requirements (CCyB) during these periods suggests that the banking system was deemed sufficiently resilient and stable.

**The results corroborate with the histogram distribution of the credit-to-GDP gap in Figure 4.** Figure 4 illustrates the distribution of the gap, which shows that out of the 124 observations, 101 observations (81.5 percent) had a value that is less than or equal to 2 percent thus showing a pronounced negative skew, while 23 observations (18.5 percent) had a value exceeding 2 percent. The highest gap was observed in 1996 Q1 and Q2 with a gap of 5.3 percent and 6.4 percent, respectively, and the calibrated buffer add-on in this regard, should have been 1.4 and 1.0 percent.

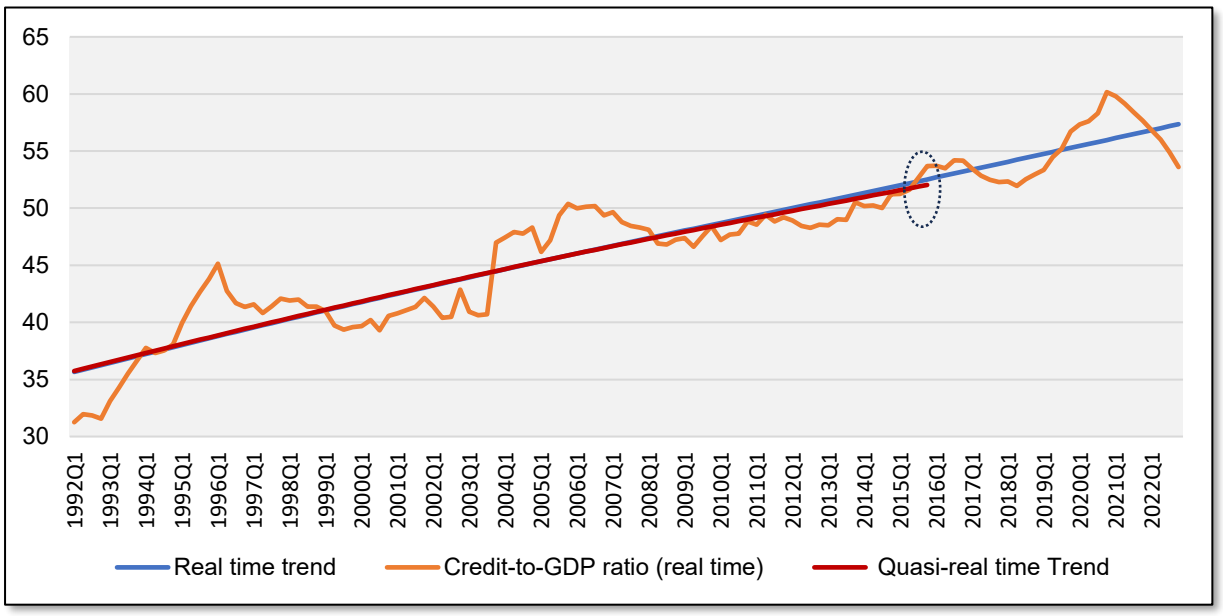
**Figure 4: The Distribution of the credit-to-GDP gap**




Source: Author's Own computations

## 7.4. End of Sample Problems

**Figure 5: HP Filter End of sample problem**




Source: Author's Own computations

**HP filter has some shortcomings that are important to consider when interpreting the credit-to-GDP gap.** The HP filter is a valuable early warning indicator for predicting financial crises as it highlights deviations of the credit-to-GDP ratio from its long-term trend. This

characteristic makes it a recommended tool within the Basel III framework for the CCyB. However, despite its usefulness, the HP filter methodology faces few challenges. Figure 5 illustrate one of the common shortcomings of the HP-filter particularly the end of sample problem. The study used quasi-real time[10] data to demonstrates the end of sample challenges with the HP filter. The quasi-real time and real time data point trend each other from 1992Q1 up until 2010 when the deviation starts, illustrating the end of sample problem. The period until 2015 shows that the credit-to-GDP gap would have been below the trend using the real time data; however, using the quasi-real time data, it shows that the gap would have been above the trend which would mislead the adjustment of the CCyB buffer. The HP filter's end-of-sample estimates might not fully be accurate and reliable, especially if the historical data has been influenced by significant economic events such as structural changes, data revisions and updates. This can impact the accuracy of identifying turning points in the credit-to-GDP gap (Hamilton, 2017). Other shortcomings that are important to consider when interpreting the HP filter credit-to-GDP gap include:

- **Over-smoothing and sensitivity to parameter choice:** The HP filter tends to smooth the data, which can lead to delayed detection of turning points in the credit-to-GDP gap. It might not capture short-term fluctuations adequately, making it less responsive to rapidly changing credit conditions. Moreover, the filter's results can be sensitive to the choice of the smoothing parameter (lambda), which depends on data characteristic and analytical goals. Different values of lambda can lead to different estimates of the credit-to-GDP gap, potentially affecting the assessment of credit cycles.
- **Lack of causal interpretation:** The HP filter provides a statistical decomposition of the data, but it does not establish causation between credit-to-GDP gaps and economic outcomes. It is essential to complement the analysis with economic theory and empirical evidence to understand the drivers and implications of credit cycles.

**Considering these shortcomings, it is crucial to use the HP filter as one of several analytical tools and to not rely solely on its results**. The policy makers are advised to not solely rely on the HP filter on the decision for the buffer add-ons. Complementing the analysis with other methods and economic insights can enhance the understanding of credit cycles and their relationship with financial stability and economic performance. Additionally, policymakers and researchers should be cautious in interpreting the credit-to-GDP gap and consider the broader economic context as well as infer whether the credit-to-GDP is consistent

10 Quasi real-time data is a series constructed using the final vintage (latest estimate) of the data to estimate credit-to-GDP gaps recursively. The method uses data available up to a specific quarter to estimate the credit-to-GDP gap for that period. "The difference between the Real-time and the Quasi-real credit-to-GDP gap estimates at a particular time is due to data revisions alone, since the estimates use the same data sample periods" (Farell, 2014).

with other key indicators when making policy decisions. In addition, to minimise the end of sample problem, Hamilton (2017), proposed the use of linear projections. This study also attempted the use of other gaps such as the *BP, CF and Bev*[11]; however, all gaps yielded similar results as the HP filter. This led to the conclusion that the method to calculate the trend and gaps are mostly just indicators to guide the calibration of the buffer add-on, hence, the decision should be complimented with a holistic assessment of various macro-financial indicators. It is generally concluded that the credit-to-GDP ratio is a good early warning indicator for financial stress; however, the measurement of the gap should be complimented by other indicators.

## 8. Conclusion

**The study focused on assessing the implementation of the CCyB in Namibia, using the credit-to-GDP ratio and the HP filter.** Using time series data from 1992 to 2022, the analysis revealed four positive gaps that consistently trended above the trendline, while the remaining gaps showed values below the trend. The study provided a practical example of how the CCyB could be effectively used by graphing the credit-to-GDP gaps. Based on the analysis, a positive buffer add-on was calibrated for gaps that exceeded a value of 2, while gaps below 2 were assigned a buffer add-on of 0. Importantly, none of the gaps reached or exceeded a value of 10, which meant that the buffer add-on remained below 2.5 percent throughout the study period. This approach demonstrated a clear and systematic way of determining the appropriate buffer add-on, considering the credit-to-GDP gaps and their associated risks to enhance the resilience of the financial system.

**Based on these findings, the implementation of the CCyB using the credit-to-GDP appears to be a viable option for Namibia's financial system; however, the calibration of buffer add-on decision needs to be complimented by other macro-financial indicators.** The gap, trend, and buffer charts analysis provided insight that acts as a stress indicator, and it is consistent with the Basel III's recommendations for the modification of the buffer add-on. The positive gaps above the trend indicated the need for additional capital during periods of excessive credit growth, enhancing the financial system's resilience and mitigating potential risks associated with credit booms. The calibrated buffer add-on provides a flexible approach, allowing for a measured response to varying credit conditions. To make a well-informed decision on implementation, it is crucial to be cognisant that timely and adequate calibration is necessary for the CCyB to be effective in upholding financial stability.

[11] BP (Band pass), CF (Christiano-Fitzgerald), Bev (Beveridge Nelson decomposition).

In addition, the adjustments of the buffer should consider the overall economic environment as well as the recent economic threats that are prevalent in the economy. Furthermore, engaging with relevant stakeholders and experts from both the financial and regulatory sectors would be instrumental in formulating a comprehensive and effective policy framework for the CCyB in Namibia.

**Overall, the experience from other central banks demonstrates that the CCyB calibration process involves a holistic analysis of the credit-to-GDP ratio alongside other crucial economic indicators.** The case study involving South Africa, the UK, Nigeria, and New Zealand concluded that the credit-to-GDP ratio is a key indicator in the assessment of the CCyB decisions. In addition to the credit-to-GDP ratio, the central banks also consider other key economic fundamentals in their decision-making process. These may include factors such as household and corporate debt levels, asset prices, economic growth, unemployment rates, and inflation dynamics etc. The assessment of these fundamentals helps form a comprehensive view of the prevailing economic and financial conditions, for a well-informed decision regarding the appropriate buffer rate. The main decision body responsible for setting the CCyB calibration is the central bank, and the decisions are communicated to the public promptly, after they are made.

## 9. Recommendations

**The assessment above provided a practical example of how the CCyB can be implemented in Namibia.** By implementing the CCyB, Namibia's banking institution can benefit from an additional capital buffer during credit booms, helping to enhance its resilience and stability. On this background, the following is recommended as a way forward:

1. **Ongoing assessment of the indicator in conjunction with supplementary macrofinancial indicators.** The Bank is encouraged to establish a strong monitoring structure to regularly track credit growth, credit-to-GDP gaps, and other pertinent macroeconomic indicators and introduce the buffer gradually.
2. **Adopt a phased-in approach to implementing the CCyB.** This approach entails implementing the CCyB and maintaining it at "zero default" as the analysis in this study shows that there is no imminent need to implement or consider the CCyB add-on given that credit relative to GDP remains well below its long-term trend current. This approach promotes a smooth transition, minimizing market disruptions, and provides banks with sufficient time to adjust their risk management and capital planning processes.

3. **Develop a CCyB framework defining the scope and the operation of the CCyB.** Using the framework and the monitoring structure, policymakers (the Macroprudential Oversight Committee) would be able to adjust the buffer add-on according to the current economic conditions with the aid of the frequent evaluations.
4. **Benchmark with international best practices:** Benchmark Namibia's CCyB framework against international best practices and learn from other countries' experiences in putting CCyB regulations into effect. This will help tailor and modify the policy to suit the country's unique financial landscape.

## References


Auer, R., & Ongena, S. (2016). The Countercyclical Capital Buffer and the Composition of Bank Lending, Bank for International Settlements, Basel, Working Paper 593.

Australian Prudential Regulation Authority. (2019). Countercyclical capital buffer, available online: https://www.apra.gov.au/sites/default/files/the_countercyclical_capital_buffer_-january_2019.pdf

Bajic,G & Fahr, S. (2023). Shelter from the storm: recent countercyclical capital buffer (CCyB) decisions. Macroprudential Bulletin, European Central Bank, April 2023.

Bank of England. (2023). The countercyclical capital buffer (CCyB). Available online: https://www.bankofengland.co.uk/financial-stability/the-countercyclical-capital-buffer

Bank of England. (2023). Prudential Regulatory Rulebook. Available online: https://www.prarulebook.co.uk/rulebook/Content/Chapter/211279/19-06-2023.

Bank for International Settlement, (2019). The Capital buffers in Basel III- Executive Summary, FSI Connect, Financial Stability Institute.

Barwell, R. (2017). Building on Incomplete Foundations: Financial Stability Policy since the Crash. *National Institute of Economic review*, 241(1), 33-47.

Basel Committee on Banking Supervision. (2010). Guidance for National Authorities Operating the Countercyclical Capital Buffer, December 2010.

Basel Committee on Banking Supervision. (2017). Range of practices in implementing the countercyclical capital buffer policy, June 2010.

Central Bank of Ireland. (2023). Macroprudential policies for bank capital countercyclical buffer, available online: https://www.centralbank.ie/macro-prudential-policies-for-bank-capital/countercyclical-capital-buffer

Dana, B.S. (2018). Evaluation Of Macroprudential Policy on Credit Growth in Indonesia: Credit Registry Data Approach. *Etikonomi Jurnal Ekonomi*, Vol.17(2): 199-212.

Drehmann, M., Borio, C., Gambacorta, L., Jimenez, G., & Trucharte, C. (2010). Countercyclical capital buffers: Exploring options, BIS Working Paper 317.

Drehmann, M., Yetman, J., & Tsatsaronis, K. (2018). Why you should use the Hodrick-Prescott filter – at least to generate credit gaps, Bank for International Settlement, BIS Working Papers (744), September (2018).

Edge, R.M., & Meizenzahl, R.R. (2011). 'The unreliability of credit-to-GDP ratio gaps in real time: Implications for countercyclical capital buffers', International Journal of Central Banking, 7(4): December, 261–298.

Faria-e-Castro, M. (2021). A quantitative analysis of the countercyclical capital buffer, European Systemic Risk Board, Working Paper 120, June 2021.

Flamini, V., Bologna, P., Di Vittorio, P., & Zandvakil, R. (2019). Credit Cycle and Capital Buffers in Central America, Panama, and the Dominican Republic, IMF working paper, WP/19/39.

Hamilton, J.D. (2018). Why you should never use the Hodrick-Prescott Filter. The Review of Economics and Statistics, 100(5), 831–843.

Hodrick, R. J., & Prescott, E. C. (1997). Postwar U.S. Business Cycles: An Empirical Investigation. Reprinted in: Journal of Money, Credit and Banking, 29, 1–16.

Jokipii, T., Nyffeler, R., & Riederer, S. (2021). Exploring BIS credit-to-GDP gap critiques: The Swiss casa. *Swiss Journal of Economics and Statistics,* 157(7).

Jorda, O. (2011). Discussion of "Anchoring countercyclical capital buffers: The role of credit aggregates". International Journal of Central Banking, 7(4), December, 241–259.

Karmakar, S. (2016). "Macroprudential regulation and macroeconomic activity," *Journal of Financial Stability*, 25, 166 – 178.

Yazdanpanah, H., Eslamloueyan, K., Hadian, E., & Shahnazi, R. (2021). The Effects of Countercyclical Capital Rules on Banking Stability and Macroeconomic Dynamics in Iran. *Applied Economics Studies*, Vol 8(36).

Central Bank of Nigeria. (2021). Guidelines on Regulatory Capital, available online: 1. guidelines on regulatory capitaL.pdf (cbn.gov.ng).

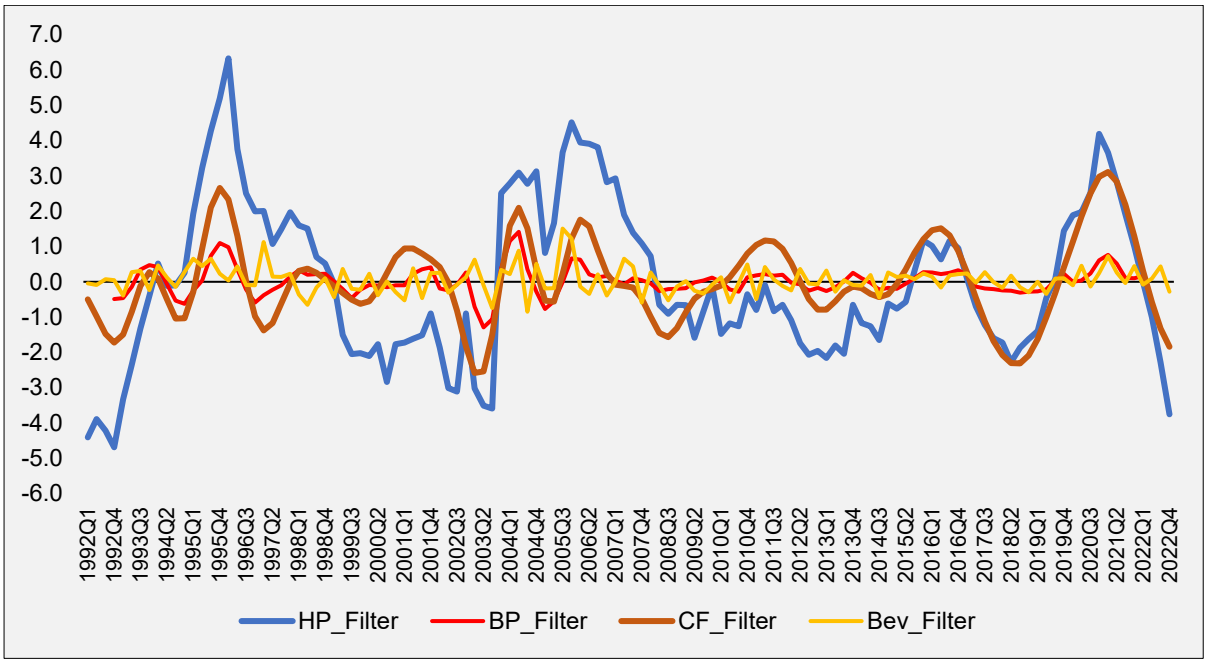
O'Brien, E., O'Brien, M., & Velasco, S. (2018). Measuring and mitigating cyclical systemic risk in Ireland: The application of the countercyclical capital buffer. Central Bank of Ireland, Financial Stability Notes, (4).

South African Reserve Bank. (2021). Capital Framework for South Africa based on the Basel III framework, available online: D5 - 2021 - Capital Framework for South Africa based on the Basel III framework (resbank.co.za)

South African Reserve Bank. (2015). Countercyclical capital buffer for South Africa based on the Basel lll framework, available online: C8/2015: Countercyclical capital buffer for South Africa based on the Basel III framework (resbank.co.za)

## Annex

**Figure 1A: Alternative gap filters**




Source: Author's Own compilations

### Case studies: Experience from other countries on the implementation of the CCyB

**This section focuses on exploring the CCyB implementation approaches of four jurisdictions that are at the forefront of employing the CCyB tool as part of their macroprudential policy frameworks.** Emphasis is placed on South Africa due to the interconnectedness between the Namibian and South African financial systems. The Bank of England (BoE), Reserve Bank of Australia, Central bank of Ireland, and Nigeria who are actively implementing the CCyB in their respective banking systems are also reviewed.

## 1. Bank of England

**Since the 2008 GFC, the BoE introduced the CCyB as an additional capital cushion to absorb potential losses in the financial system.** The CCyB is a significant macroprudential policy used by the Financial Policy Committee (FPC) to fulfil its statutory responsibility of safeguarding and enhancing the resilience of the financial system. The main objective of the FPC in determining the UK CCyB rate is to enhance the banking system's ability to withstand shocks without causing undue restrictions in essential services, such as credit extension, to the real economy (Bank of England, 2023). The CCyB applies to all banks, building societies, and investment firms incorporated in the UK, except those specifically exempted by the Financial Conduct Authority (FCA).

**The CCyB is part of the broader framework of equity and other loss-absorbing capital requirements imposed on all banks.** The framework of risk-based capital consists of three elements. Firstly, the minimum levels of going concern capital of 6 percent that must be met at all times, for which banks follow internationally agreed methods. Secondly, the system-wide buffers of equity which sum to the combined buffer requirement which comprises of the capital conservation buffer set at 2.5 percent of risk weighted assets, and thirdly, the CCyB which varies in line with the FPCs decision.

**The FPC considers various factors in setting the CCyB rate.** The FPC considers the extent of financial vulnerabilities and the risk that the banking system could experience losses on its UK exposures arising from those vulnerabilities that may result in credit supply disruptions. As such, when vulnerabilities are building up, the FPC expects to increase the UK CCyB rate. The pace of adjustment is determined with reference to the level and growth of financial vulnerabilities, and the economic cost of building resilience. The FPC is cognisant that building resilience by increasing the CCyB rate may also restrain credit growth and reduce the future build-up of financial cycle vulnerabilities, and as such, this is not the main objective of any rise in the CCyB.

**Moreover, in the current context of its overall capital strategy, the FPC judged that the neutral rate for the UK CCyB is around 2 percent.** When the FPC increases the CCyB rate or recognises a CCyB for another country, banks are granted 12 months before they must use this rate for calculating their institution specific CCyB rates. In exceptional circumstances, a shorter implementation period may be justified, but a longer one is not allowed. On the other hand, following a decision to decrease the CCyB rate, the FPC must specify an indicative period during which no further increase in the rate is expected. This helps ensure the capital which has been released can be used to ensure that the banking system is able to better absorb rather than amplify the shock.

**The FPC is obligated to set the CCyB rate every quarter.** All CCyB decisions are made public following the FPC's policy meetings, and more insights on the decisions are provided in the FPC's semi-annual Financial Stability Report and published on the BoE's website.

## 2. Reserve Bank of Australia

**Like other jurisdictions, the Australian CCyB aims to ensure that banks can repay their creditors and continue lending, even in severe economic downturns.** The CCyB is an additional amount of capital which ranges between 0 and 2.5 percent of the risk-weighted assets. The CCyB is set by the Australian Prudential Regulation Authority (APRA) for authorised deposit-taking institutions (ADIs). Since its introduction in 2016, the buffer has been maintained at 0 percent of the risk-weighted assets (APRA, 2019).

**The APRA reviews the CCyB rate on a quarterly basis based on a forward-looking approach.** The reviews are influenced by key systemic risk indicators that encompass factors such as credit growth, asset prices, lending conditions, and financial stress. Other crucial factors considered include the existing resilience of the ADIs, the effectiveness of supervisory and prudential measures already in place, and supplementary data sources. In addition, the reviews are conducted in consultation with the Council of Financial Regulators to ensure a comprehensive and well-informed decision on setting or adjusting the CCyB level. This collaborative approach helps the APRA to make prudent and effective decisions to maintain the stability and resilience of the banking sector during various economic and financial conditions.

## 3. Central Bank of Ireland

**In Ireland, the Central Bank is responsible for setting the CCyB rate and reviews it on a quarterly basis.** As part of the Single Supervisory Mechanism, the European Central Bank (ECB) assesses the CCyB decisions of national authorities and if necessary, has the power to set a higher rate. Following consultations with the ECB, the Central Bank sets the CCyB rate (Central Bank of Ireland, 2023).

**The current CCyB is set at 0.5 percent; however, going forward, the CCyB is expected to be at 1 percent in November 2023, and 1.5 percent from June 2024.** The Central Bank intends to set the CCyB rate at 1.5 percent when risks in the banking system are neither high nor low. This acknowledges the uncertainty in assessing risk levels and the time required to implement changes to the CCyB. However, if indicators such as credit conditions, the domestic economy, asset prices, risk appetite, and global conditions point to emerging imbalances or a high-risk environment, the CCyB rate is expected to be set above 1.5 percent.

**In cases of increased systemic risk or an economic downturn, the Central Bank considers a partial or full reduction of the CCyB rate.** This allows the banking system to absorb losses and continue supplying credit to the economy during challenging times. Overall, the Central Bank's approach to setting the CCyB rate is based on monitoring and responding to cyclical risk conditions to ensure the stability of the banking sector and support the sustainable provision of credit to the economy.

## 4. Reserve Bank of South Africa

**The implementation of CCyB in South Africa began in 2016, as set out in the Capital Framework which is based on the Basel III Framework (SARB, 2021).** Aligned to the objectives of other jurisdictions, the CCyB in South Africa serves as a tool to increase the resilience of the banking sector during periods of excess aggregate credit growth that is associated with the build-up of systemic risk. The credit-to-GDP gap as set out in the BCBS Guide is the main indicator informing the activation of the CCyB in South Africa. However, it is not the only indicator considered to inform the policy rate, as such, the SARB may at its discretion use other indicators together with the credit-to-GDP gap.

**The CCyB is applicable to all banks, but not to the non-bank financial institutions.** In accordance with Regulations relating to banks, the CCyB add-on rate is set in a range of between 0 percent and 2,5 percent of the Risk Weighted Assets (RWA). In April 2023, the SARB announced that it is in the process of assessing the appropriate CCyB neutral level for South Africa. Moreover, banks are allowed to use the released portion of the CCyB that has been built up as soon as the reduction in the buffer rate is announced.

**The South African CCyB implementation strategy is underpinned by the following principles:**

i. The CCyB add-on rate is calculated as the weighted average of the buffers in effect in the jurisdictions to which banks have private sector credit exposures.
ii. The CCyB applies to bank-wide total RWA as used in the calculation of all risk-based capital ratios, which is consistent with it being an extension of the capital conservation buffer.
iii. The banks may implement a buffer of more than 2.5 percent, if deemed appropriate. However, there will be no requirement for other countries to apply buffers above 2.5 percent (or the relevant thresholds during the transition period), or a pre-announced lead time that is shorter than 12 months, when implementing reciprocity.
iv. Changes in the CCyB are communicated directly with the banks and the secretariat of the Basel Committee. However, regular updates on the assessment of the macro financial conditions and the prospects for the potential implementation of or any change in buffer requirements are also communicated through the Financial Stability Review.

### Other African Countries

**Several African countries have also implemented the CCyB as a macroprudential policy tool to strengthen their banking systems during varying economic conditions.** The Central Bank of Nigeria (CBN), in 2020, introduced the CCyB with a range of 0 to 2.5 percent, which can be adjusted periodically, considering prevailing economic and industry conditions. The announcement of the required CCyB is made twelve months in advance, allowing banks to prepare and build up their capital buffers to the necessary level. In cases of imminent crises, the CBN may demand banks to build up the CCyB with shorter notice.

**Notably, the Central Bank of Morocco implemented the CCyB in 2016, the Bank of Ghana in 2019, and the Central Bank of Tunisia in 2020, among others.** The decisions on the rate of the buffer are all based on the assessment of credit risk and are activated when credit conditions warrant the need for additional capital buffers in the banking system. The decision on the specific rate of the buffers is based on an assessment of credit risk, and it is activated when credit conditions warrant it. Overall, these measures aim to enhance the resilience of the banking system in the respective countries during times of economic stress.