Report of the

Internal Working Group

on

Implementation of Counter-cyclical Capital Buffer

(Draft)

RESERVE BANK OF INDIA

December 2013

Contents

Approach and Recommendations

0.1 Businesses are prone to the impact of boom-bust economic cycles. Banking business is no exception to this; rather banks are more prone to economic cycles as they have exposure to many business entities at any given time and the combined effect of the performance of all these entities is to be borne by the banks in all phases of the economic cycles. This dimension of pro-cyclicality, is what makes banking different from other businesses. It accentuates the ill-impacts of economic cycles in a feedback loop, i.e., the cycle becomes self-fulfilling, increasing in size and causing externalities to the economy and society.

0.2 In boom times, there is more demand for credit and banks tend to become aggressive, which could lead to relaxation in credit standards and in excessive credit growth. Debtors tend to do well and service the loans in time. They also improve their financials as also their credit ratings. Banks' loan losses and capital requirements fall below their long-run average and the need for loan loss provisions are less. Banks make good profits as the loan loss provisions are low. Despite higher credit growth, banks typically do not need commensurately higher capital as their borrowers are likely to have good credit ratings and as per Basel capital requirements, high rated borrowers require less capital. A higher amount of profits is thus distributed as dividends.

0.3 When the economic cycle turns, borrowers' credit quality tends to worsen, leading to a higher probability of default in servicing interest and principal re-payment. Some of these loans become non-performing assets (NPAs). Banks' profits start dipping or they may even start making losses, resulting in write-off of capital. At the same time, they are required to make higher loan loss provisions for the non-performing loans and maintain higher capital for the rating down-gradation of their borrowers. With their poor financials, banks do not get external capital to support their existing loan portfolio, and further growth in credit. This results in banks becoming cautious and restricting lending, thereby resulting in the credit contraction risk spilling over to the real sector of the economy which at that time needs credit the most. It may lead to systemic risk which may spiral into economic crisis.

0.4 The financial crisis which originated in 2007 was unlike some of the past crises in that it did not occur due to a crash in the stock market. It originated in the banking and

the shadow banking sectors in the form of excessive credit growth. When the credit bubble burst, banks were saddled with huge losses and capital write-offs. Further, banks were also finding it difficult to raise additional capital from the market. These losses destabilised the banking sector and sparked a vicious circle, whereby problems in the financial system contributed to restricting lending to the real sector that then fed back on the banking sector. Such interactions of the banking sector with the real economy highlighted the importance of effects of pro-cyclicality of capital and provisioning requirements in banking sector.

0.5 The issue of pro-cyclicality of bank capital regulation, as shown in various studies[1], dates back to Basel II or to some extent to Basel I days. Repullo and Saurina (2011) have underscored the impact of Basel II capital requirements on pro-cyclicality by showing that the bank capital regulation may amplify business cycle fluctuations[2]. This effect may be more pronounced during downturns, when banks find it difficult to raise additional capital, which results in restricted lending.

0.6 The issue of pro-cyclicality was discussed in the meeting of the G-20 in November 2008 and it was agreed to address pro-cyclicality in financial market regulations and supervisory systems. Five principles were set for reform of financial markets, one being on "enhancing sound regulation". The G-20 instructed the International Monetary Fund (IMF), the Financial Stability Forum (FSF), later renamed the 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, excessive compensation, and provisioning practices may exacerbate cyclical trends. This brought into focus creation of macro-prudential tools to deal with pro-cyclicality and create countercyclical provisioning[3] and capital buffers to obviate systemic risk.

0.7 Looking at the need for development of macro-prudential tools to address pro-cyclicality, the Group of Central Bank Governors and Heads of Supervision (GHOS), the oversight body of the BCBS (or Basel Committee), envisaged introduction of a

[1] Kashyap and Stein (2004), Gordy and Howells (2006), and Repullo and Suauz (2009)
[2] Rafael Repullo and Jesús Saurina, The Countercyclical Capital Buffer of Basel III: A Critical Assessment
[3] The framework for countercyclical provisioning based on "expected loss" model rather than the "incurred loss" model currently in vogue, is being developed separately by the IASB and FASB, at the behest of the Basel Committee and G20. This Report does not cover that aspect.

framework for countercyclical capital measures. Their press release dated September 7, 2009 included a commitment to introduce a framework for Countercyclical Capital Buffer (CCCB) over and above the minimum capital requirement. The December 2009 Consultative Document, "*Strengthening the resilience of the banking sector*", set out the following four objectives to address the issue of pro-cyclicality:

i Dampening the excess cyclicality of the minimum capital requirement;

ii Promoting more forward looking loan loss provisions;

iii Conserving capital to build buffers at individual bank level and at the banking sector which can be used during periods of stress; and

iv Achieving the broader macro-prudential goal of protecting the banking sector from periods of excessive credit growth.

Thereafter, the Basel Committee issued a consultative Document on *Countercyclical Capital Buffer* in July 2010 for comments and issued *Guidance for national authorities operating countercyclical capital buffer* as part of the Basel III package in December 2010.

0.8 The CCCB is a critical component of the Basel III framework. Though presently not many countries have issued the guidelines on implementation of the buffer in their respective jurisdictions, most countries are expected to adopt it in the coming years. The primary aim of the CCCB regime is to build up a buffer of capital which can be used to achieve the broader macro-prudential goal of restricting the banking sector from indiscriminate lending in the periods of excess credit growth that have often been associated with the building up of system-wide risk.

0.9 The CCCB regime endeavours to ensure that not only the individual banks remain solvent through a period of stress, but also that the banking sector has capital in hand to help maintain the flow of credit in the economy during economic downturns and periods of stress. Further, as capital is a more expensive form of funding, the stipulation regarding build-up of capital defences may have the additional benefit of moderating excessive credit growth when economic and financial conditions are buoyant. At the same time, during the period of excessive credit growth, the buffer may act as a moderator from the debtors' perspective as it is likely to raise the cost of credit, and

therefore, dampen its demand, and may help to lean against the build-up phase of the cycle in the first place.

0.10 Against this backdrop, the Reserve Bank of India (RBI) set up an Internal Working Group (IWG) under the Chairmanship of Shri B Mahapatra, Executive Director, RBI, to create a CCCB framework for banks in India.

The Approach of the IWG

0.11 The Basel Committee, based on empirical evidence, has observed that excessive credit growth builds up system-wide risk and prescribed credit-to-GDP ratio as the starting reference point for implementation of CCCB. Credit-to-GDP ratio tends to rise during the period of economic boom and fall during the period of economic downturn. The difference of the credit-to-GDP ratio from its long-term trend, viz., credit-to-GDP gap (actual credit-to-GDP ratio *less* long term credit-to-GDP trend) indicates the build-up of excessive credit growth in an economy and system-wide risk as a precursor to the crisis. The CCCB should, therefore, be build up when the credit-to-GDP gap exceeds a defined threshold.

0.12 The CCCB, by being based on credit, has significant advantage over many of the other variables of appealing directly to the objective of the CCCB, which is to achieve the broader macro-prudential goal of protecting the banking sector during periods of excess credit growth. Incidentally, it may be mentioned that the Basel Committee recognizes that the credit-to-GDP gap may not always work in all jurisdictions at all times, and that the authorities may enunciate a set of principles for the buffer decision in a transparent way. Judgment coupled with proper communications is thus an integral part of the CCCB regime. Further, the CCCB guide should also be internationally consistent.

0.13 The IWG noted the guidance of the Basel Committee, and in its analysis, has endeavoured to enunciate principles that would work in conjunction with judgement so as to establish a sound framework for CCCB in India, as also to facilitate further decision-making in the setting of CCCB.

0.14 Keeping in view the 'comply or explain' framework of the Basel Committee, the IWG started with calculating the credit-to-GDP gap as prescribed by the Basel Committee for CCCB framework for India. The IWG was aware of the drawbacks of depending solely on credit-to-GDP gap for CCCB framework. In a structurally transforming economy with rapid upward mobility, growth in credit demand will expand faster than GDP growth for several reasons:

0.14.1 India may shift increasingly from services to manufacturing where the credit intensity is higher per unit of GDP;

0.14.2 India needs to double its investment in infrastructure which will place enormous demand on credit; and

0.14.3 Impetus to Government and RBI's financial inclusion programme will bring millions of low income households into formal banking system with almost all of them needing credit.

0.15 Hence, the resulting inferences from credit-to-GDP gap may be misleading as it will be difficult to identify what and how much is due to structural transformation and how much is due to excessive credit growth. However, as the structural transformation gets entrenched and is reflected in the evolving trend, the deviation from this new trend could still indicate the "unsustainable" part of the credit demand, which may be "excessive" and may require dampening. Triggering the CCCB too early out of excessive caution may involve sacrifice of growth. On the other hand, complacency and failure to trigger buffer decision may lead to build up of pressure.

0.16 Given this context, the IWG felt that instead of mechanically following the credit-to-GDP ratio and credit-to-GDP gap, the Basel framework may be tested in Indian conditions, and if required, suitable modifications be made to the framework. The IWG tried to dovetail the CCCB framework prescribed by the Basel Committee to Indian conditions, albeit with a caveat that the CCCB calibration is such that the credit growth required for an emerging market economy like India does not get choked.

0.17 The empirical exercise to identify the suitability of credit-to-GDP ratio required a sufficiently long time series data on both credit and GDP. This posed a challenge as data to carry out a comprehensive evaluation and backtesting was not readily available. Though a large number of components of aggregate credit are presently being captured

by regulators/entities, a long term time series at quarterly frequency of the same is not available with them.

0.18 While determining the sources of credit, it was not possible to define credit in an all-encompassing way as long term time series of quarterly data on variables such as (i) loans by housing finance companies (HFCs), (ii) loans by Non-banking finance companies (NBFCs), (iii) issue of commercial paper, and (iv) issue of bonds by corporate sector, were not available at quarterly frequency from their respective sources. Therefore, the availability of reliable time series data for sufficient length of time became the criteria to decide whether a particular component of credit would be included in the definition of credit for the purpose of analyzing the suitability of credit-to-GDP ratio. For the purpose of present exercise, the IWG decided to use data on bank credit comprising credit by scheduled commercial banks (including regional rural banks) as such a time series of data was available for a long period, as far as mid-1990s.

0.19 In India, availability of GDP data at quarterly frequency is relatively recent, with official data available from 1996-97. However, similar time series was not available for some of the other variables used by the IWG in its analysis, such as Gross NPA (GNPA) growth, etc. Keeping in view the availability of quarterly time series data on major components of credit and GDP, as also, corresponding data for other variables, the IWG decided to use time series data for all the indicators to be used in the present exercise from March 2001.

0.20 Further, the GDP data also show substantial seasonal variation, which needed to be taken into account before computing the credit-to-GDP ratio. Therefore, the standard method of de-seasonalising the GDP data was used, and the resultant seasonally adjusted GDP was used for computation of credit-to-GDP ratio.

0.21 Calculation of credit-to-GDP gap requires estimation of long term trend of credit-to-GDP ratio. For this purpose, the Basel Committee has prescribed use of one sided Hodrick Prescott filter. Though, the IWG considered use of one-sided Hodrick-Prescott filter as suggested by the BCBS guidance paper, due to limitations of data availability, particularly the quarterly GDP (before 1996-97) and other related variables (before 2001-02), using one-sided filter was not feasible. The IWG recognized this as a

limitation and decided to proceed with use of two-sided Hodrick-Prescott filter for the purpose of analysis.

Issues and Recommendations

The recommendations of the IWG preceded by briefs on the relevant issues are given below:

Authority to operate the CCCB

0.22 The IWG noted that the authority to operate CCCB would require relevant and current supervisory and macroeconomic information. The CCCB decision may have implications for the conduct of monetary policy on one hand and supervision function on the other. The IWG felt that RBI would be better placed in conducting a detailed assessment of prevailing supervisory and macroeconomic information, as in India these functions and information is vested with itself.

Recommendation 1

RBI shall be the authority to operate and communicate the CCCB decision.

(Paragraph 3.10)

Credit-to-GDP Gap Estimation

0.23 The analysis was carried out using credit-to-GDP gap to estimate the level where the CCCB may be triggered, i.e., the lower threshold (L). However, the IWG observed that using long term credit-to-GDP gap on its own, could not help in identification of the lower threshold of CCCB. The IWG felt that the likely reasons for inadequacy of credit-to-GDP gap as a sole factor may be because of India specific circumstances such as, the stage of economic development, the degree of maturity of financial markets, the institutional framework, the process of structural transformation underway, etc. Hence, the IWG deviated from the methodology prescribed by the Basel Committee considered it necessary to use data on growth in GNPA, along with the credit-to-GDP data to arrive at the thresholds.

Recommendation 2

While the credit-to-GDP gap may be used for empirical analysis to facilitate CCCB decision, it may not be the only reference point in the CCCB framework for banks in

India and the credit-to-GDP gap may be used in conjunction with other indicators like GNPA growth for CCCB decisions in India.

(Paragraph 3.26)

Pre-announcement of the CCCB

0.24 The IWG observed pro-cyclicality in the time series data on credit-to-GDP gap and the annual growth on GNPA of the banking industry in India. The relationship between credit-to-GDP gap and annual growth in GNPA was obtained, and it was observed that the credit-to-GDP gap leads GNPA growth, statistically significantly, by sufficient period with a peak statistical significant period of 9 quarters. Hence, given the lag identified by the analysis, the IWG felt that the CCCB should be triggered well before the expected increase in GNPA. Further, in line with the Basel Committee prescription, the CCCB decision may be pre-announced with a lead time of up to 12 months (4 quarters).

Recommendation 3

The CCCB decision may be pre-announced with a lead time of 4 quarters.

(Paragraph 3.33)

Setting the Lower Threshold of the CCCB

0.25 The Basel Committee has prescribed the lower threshold (L) value for CCCB at 2 percentage points of the credit-to-GDP gap. To estimate the CCCB trigger threshold, the IWG used the method proposed by Sarel (1996). In the analysis, it was observed that when the credit-to-GDP gap reaches 3 percentage points, its relationship with GNPA became highly significant. Hence the CCCB trigger (lower threshold, L) for the Indian banking system may be when the credit-to-GDP gap reaches 3 percentage points provided the relationship with GNPA remains significant.

Recommendation 4

The lower threshold (L) of the CCCB when the buffer is activated may be set at 3 percentage points of the credit-to-GDP gap, provided its relationship with GNPA remains significant.

(Paragraph 3.35)

Fixing of the Upper Threshold of the CCCB

0.26 The Basel Committee has prescribed higher threshold (H) value for CCCB at 10 percentage points of the credit-to-GDP gap. However, India being an emerging market economy, growth related concerns would warrant credit expansion that could not be compared with other countries, especially developed countries. Hence, in Indian context, the upper threshold of 10 percentage points of credit-to-GDP gap as prescribed by the Basel Committee was not found to be suitable by the IWG, as it felt that it may constrain the credit growth.

0.27 Looking at empirical evidence in the past decade, it was observed that the credit-to-GDP gap had exceeded 20 percentage points only in one quarter and even came close to that level only during two earlier quarters. Further it was observed that credit-to-GDP gap has immediately fallen sharply after each peak, due to combination of several factors, including the policy response. Average credit-to-GDP gap during a run of positive values from September 2005 to September 2009 works out to 11.56 percentage points. The credit GDP gap exceeded 15 percentage points only on four occasions.

0.28 The Basel Committee has observed that H should be low enough, so that the buffer would be at its maximum prior to major banking crises. Considering these factors, the IWG felt that a threshold value of 15 percentage points may be identified to deploy the maximum value of CCCB, in view of the rarity with which this threshold has been breached in the recent history.

Recommendation 5

The upper threshold (H) of the CCCB may be kept at 15 percentage points of credit-to-GDP gap.

(Paragraph 3.37)

Calibration of CCCB

0.29 The IWG noted that the CCCB shall be activated when credit-to-GDP gap exceeds the lower threshold (3 percentage points) and shall be 2.5 per cent of risk weighted assets when it touches the upper threshold (15 percentage points). For any other value

of the credit-to-GDP gap between 3 and 15 percentage points, the CCCB will vary linearly from 0 to 2.5 per cent of risk-weighted assets.

Recommendation 6

The CCCB shall increase linearly from 0 to 2.5 per cent of the risk weighted assets (RWA) of the bank based on the position of credit-to-GDP gap between 3 percentage points and 15 percentage points. However, if the credit-to-GDP gap exceeds 15 percentage points, the buffer shall remain at 2.5 per cent of the RWA. If the credit-to-GDP gap is below 3 percentage points then there will not be any CCCB requirement.

(Paragraph 3.38)

Use of Supplementary Indicators

0.30 Basel Committee, in its guidance, has also recommended use of supplementary indicators in the CCCB decision making process such as various asset prices, funding spreads and CDS spreads, credit condition surveys, real GDP growth and data on the ability of non-financial entities to meet their debt obligations on a timely basis.

0.31 Looking at the limitations of the credit-to-GDP gap indicator in India, the IWG also considered other variables, including those suggested by the Basel Committee and their variants in the Indian context as possible supplementary indicators that may help in the CCCB decision. These included indicators that are relevant to our banking system, and others like housing prices, equity prices, funding spreads, credit condition surveys, real GDP growth, data on the ability of non-financial entities to meet their debt obligations on a timely basis, credit-deposit ratio, credit condition surveys, industrial outlook survey, aggregate real credit growth, banking sector profits and non-performing assets. The IWG was of the view that the demands of Indian economy and the dynamics in our domestic financial markets are different from that of other countries. Hence, instead of depending solely on one indicator, the decision on CCCB should be taken considering the dynamics of various supplementary indicators. Further, the analysis should also include the correlations that these supplementary indicators have with the GNPA growth.

Some of the supplementary indicators found relevant by the IWG are as under:

0.31.1 Credit deposit (C-D) ratio has been an integral part of micro-prudential monitoring in India. While the absolute C-D ratio is a function of several factors, including the statutory requirements, such as CRR and SLR, incremental C-D ratio provides an insight into the possible over-heating of the credit market and use of alternate sources of funding by banks. Incremental C-D ratio for moving period (one year to three years) was analysed, and it was observed that three-year moving incremental C-D ratio was bearing high positive correlation with credit-to-GDP gap. Similarly, incremental C-D ratio for moving period of three-years exhibited high negative contemporaneous correlation with the GNPA growth. However, at a higher lag, the correlation became positive.

Recommendation 7

The incremental C-D ratio for a moving period of three-years and its correlation with credit-to-GDP gap as also, with GNPA growth, may be used as a supplementary indicator for the CCCB decision.

(Paragraph 4.15)

0.31.2 Industrial Outlook (IO) Survey, an opinion based forward looking survey covering selected public and private limited companies in the manufacturing sector, is being conducted on a quarterly basis by the Reserve Bank of India. Empirical evaluation of the assessment index computed from the IO Survey indicated that the index exhibited a strong negative correlation with the GNPA growth, implying higher GNPA growth if the index is low and *vice versa*. However, the relation between this index and credit-to-GDP gap could not provide any conclusive results to the IWG.

Recommendation 8

Looking at the utility of the IO assessment index as an indicator of incipient NPA growth, it may be used along with GNPA growth as a supplementary indicator in CCCB decision.

(Paragraph 4.20)

0.31.3 The IWG observed that the Reserve Bank of India has been tracking the financial performance of corporate sector. Consistent time series of the ratios and rates for a sample of about 2,000 companies are available since the financial year

2000-01. The IWG felt that of the various financial indicators, the interest coverage ratio may be of particular importance to assess the stress faced by the corporate sector.

0.31.4 On examining the relationship of the interest coverage ratio to GNPA growth, it was found that there is no contemporaneous correlation between these indicators. However, when the correlation between interest coverage ratio and credit-to-GDP gap is examined, it is seen that in the periods of high credit-to-GDP gap, the companies have comfortable interest coverage, thereby indicating healthy financial position. Looking at the high correlation of interest coverage ratio with credit-to-GDP gap, the IWG recommends its inclusion as one of the supplementary indicators to supplement the CCCB decision.

Recommendation 9

The interest coverage ratio with credit-to-GDP gap may be used as a supplementary indicator for CCCB decision.

(Paragraph 4.26)

0.31.5 In India, the housing price index is a relatively new concept. Presently, the Reserve Bank of India is compiling a quarterly House Price Index (HPI) for some of the bigger cities. National Housing Bank (NHB) is also compiling an index, viz., RESIDEX that comprises only residential housing sector. It is envisaged that the index may later be expanded to include commercial property and land also. As there were not many data points available in the index, and also, as these indices being in formative stage, these were not considered as supplementary indicators for the current exercise.

0.31.6 Further, the RBI has also been analyzing credit conditions in specific sectors of the economy through a quarterly Credit Condition Survey (CCS) since January-March 2010. In a scenario, when it is relatively easy to monitor the credit supply by banks, but no direct quantitative data is available on credit demand, this type of survey becomes useful. This is a forward-looking survey and seeks information on various aspects of credit, including developments in credit sector and causes thereof. However, as this survey is relatively recent with only two years' quarterly data, it may not be possible to use the results of CCS immediately. The IWG felt that the data from CCS may be a very useful input for CCCB exercise and

going forward, this index may also form a part of supplementary indicators for CCCB decision.

Recommendation 10

In due course, indices like House Price Index / RESIDEX and Credit Condition Survey may also form a part of the supplementary indicators for CCCB decision.

(Paragraph 4.6 & 4.28)

0.32 In the analysis, it was observed that supplementary indicators such as incremental C-D ratio and IO Survey Assessment index have a significant relationship with the GNPA growth. Further, the lag at which the relationship gets significant is more than 4 quarters (i.e. 12 months). This coincides with the IWG's recommendation (Recommendation 3) on the period for pre-announcement of imposition of the CCCB.

0.33 The analysis of all the indicators on an ongoing basis will provide sufficient information inputs to the Reserve Bank of India to decide whether it is necessary to activate the CCCB. As the empirical evidence on the basis of any single indicator may not be conclusive, the IWG recommends that decision making in respect of CCCB may be similar to the multiple indicator approach, followed in policy making. In any case, the Basel Committee has provided ample freedom to the national authorities to *"...apply judgment in the setting of the buffer in their jurisdiction after using the best information available to gauge the build-up of system-wide risk".*

Recommendation 11

The Reserve Bank of India may apply discretion in terms of use of indicators while activating or adjusting the buffer.

(Paragraph 4.34)

Use of Sectoral Approach

0.34 Due to lack of availability of a long time series of a credible real estate index, the IWG could not use this critical indicator in the present exercise for CCCB implementation, but could only recommend it as a forward looking indicator. The IWG observed that looking at the level of development of market infrastructure in our country, as also, due to lack of availability of long time series of data, there may be

some sectors (like real estate sector) that may be critical due to their bearing on financial stability, but may not be a part of CCCB decision. Credit growth to certain sensitive sectors may lead to formation of asset bubbles and also significantly outpace the overall credit growth. Excessive credit growth in specific sectors may have significant financial stability risks.

0.35 The RBI has been applying countercyclical capital and provisioning requirements based on the analysis of sectoral credit growth. In the build-up phase, the tightening of prudential requirements made credit to targeted sectors costlier thereby moderating the flow of credit to these sectors. There is evidence that moderation in credit flow to these sectors was also in part due to banks becoming cautious in lending to these sectors on the signalling effect of RBI's perception of build up of sectoral risks. This way the exposure of banks' to these sectors was reduced. Looking at such sector specific peculiarities in our country and their subsequent impact on implementation of macro-prudential policies, the IWG recommends that the CCCB framework in India may have to work in conjunction with sectoral approaches.

Recommendation 12

The CCCB framework in India may be operated in conjunction with sectoral approach that has been successfully used in India over the period of time.

(Paragraph 4.30)

Release of CCCB

0.36 The Basel Committee had recommended that CCCB release may be required due to banking system related losses or due to systemic issues. To prevent the crisis from taking a large proportion, the release of buffer should be immediate. Basel Committee has suggested a few indicators to guide the authorities during the release phase of CCCB. However, these indicators do not provide conclusive evidence of their utility during such time. Hence, due to inherent uncertainty and the lack of experience associated with operating of CCCB, the IWG observed that the variables to be used to guide the release phase should be selected in such a way that they react sufficiently promptly. For the release phase, the same set of indicators that were used during the activating phase of the CCCB may be used. However, owing to inherent uncertainty and the lack of experience associated with operating of CCCB, the IWG felt that instead

of hard rules-based approach, flexibility in terms of use of judgement and discretion may be required for operating the release phase of CCCB.

0.37 The IWG also agreed that gradual release of CCCB or even release in discrete time/amount of CCCB would not serve the basic purpose of CCCB. The IWG felt that in case of crisis in banking sector or any other sector indirectly impacting the banking sector, it is prudent to stem the crisis early, and hence, the entire CCCB may be released at a single point in time.

Recommendation 13

The same set of indicators that are used for activating CCCB may be used to arrive at the decision for the release phase of the CCCB. However, instead of hard rules-based approach, flexibility in terms of use of judgement and discretion may be provided to the Reserve Bank of India for operating the release phase of CCCB. Further, the entire CCCB may be released promptly at a single point in time.

(Paragraph 5.5 & 5.7)

Treatment of surplus created after release of CCCB

0.38 When the CCCB returns to zero, the capital that is released is for the purpose of absorbing losses or for protecting banks against the impact of problems elsewhere in the financial system. In such a case, the Basel Committee had recommended that the capital surplus created should be unfettered and that there should be no restrictions on banks on distribution of this capital. However, the Basel Committee has left the final decision on treatment of this surplus with national authorities.

0.39 The IWG felt that unfettered access to capital by banks may not be prudent as the RBI may be required to prohibit certain use of the released buffer by banks if it feels that such an action is necessary given the prevailing circumstances.

Recommendation 14

The capital surplus created when the countercyclical buffer is returned to zero should not be unfettered. The Reserve Bank of India would provide necessary guidance to the banks as regards treatment of the surplus at times when the CCCB returns to zero.

(Paragraph 6.1)

Jurisdictional Reciprocity

0.40 To ensure a level playing field among the domestic and foreign banks, the Basel Committee has recommended jurisdictional reciprocity. The IWG observed that in view of importance of CCCB implementation in India, global best practice as suggested by the Basel Committee may be implemented. Further, Reserve Bank of India has always ensured a level playing field for all the banks having presence in India. Banks in India (both domestic and foreign incorporated) will have to ensure that the CCCB requirement is calculated based on their exposures in India.

Recommendation 15

(i) All banks operating in India (either foreign incorporated or domestic banks) should maintain capital under CCCB framework based on exposures in India.

(ii) The RBI will convey the CCCB requirement to the home supervisor of the foreign incorporated banks so that they may ensure that their banks maintain adequate capital under CCCB as prescribed by the Reserve Bank of India.

(iii) Banks incorporated in India having international presence have to maintain adequate capital under CCCB as prescribed and communicated by the host supervisors to the Reserve Bank of India.

(iv) The RBI may also ask Indian banks to keep excess capital under CCCB framework in any of the host countries they are operating if it feels the CCCB requirement in host country is not adequate. In case the CCCB requirement in other jurisdiction is nil / insufficient, the Reserve Bank of India may require that the banks maintain higher buffers.

(Paragraph 6.3)

Communication of the CCCB Decision

0.41 The Basel Committee has noted that the buffer in each jurisdiction is likely to be used infrequently, and hence, instead of making quarterly statements on CCCB decision on an on-going basis, the authorities may comment on an annual basis. In India, CCCB decisions may form a part of the annual monetary policy statement of the Reserve Bank of India. However, more frequent communications can be conducted by the Reserve Bank of India, if there are sudden and significant changes in economic condition which may have an impact on CCCB decision. At the time of communicating CCCB decision, the Reserve Bank of India may disclose, at its discretion, the

mechanics of the CCCB approach, the information that was used to arrive at the decision, etc.

Recommendation 16

The CCCB decisions may form a part of the annual monetary policy statement of the Reserve Bank of India. However, more frequent communications can be made by the Reserve Bank of India, if there are sudden and significant changes in economic condition that may have an impact on CCCB decision. Further, at the time of communicating CCCB decision, the Reserve Bank of India may disclose, at its discretion, the mechanics of the CCCB approach, the information that was used to arrive at the decision, the time line of the CCCB activation, etc.

(Paragraph 6.4 & 6.5)

Interaction of CCCB with Pillar 1 and Pillar 2

0.42 The CCCB incorporates elements of both Pillar 1 and Pillar 2. It may not be desirable that the capital is held twice both under Pillar 1 and Pillar 2 requirements. Hence, prescription under Pillar 2 should not stipulate capital requirement to capture system-wide issues, if the bank is already maintain capital under CCCB framework. Further, the IWG also felt that the capital meeting the CCCB should not be permitted to be simultaneously used to meet non-system-wide elements (e.g. concentration risk) under Pillar 2 requirement.

Recommendation 17

(i) A bank maintaining CCCB may not hold capital under Pillar 2 requirement for financial system-wide issues.

(ii) The capital meeting the countercyclical buffer should not be permitted to be simultaneously used to meet non-system-wide elements of Pillar 2 requirement.

(Paragraph 6.6)

Location of the CCCB

0.43 The IWG noted that as in the case with the minimum capital requirement, host authorities would have the right to demand that the CCCB be held at the individual legal entity level or consolidated level within their jurisdiction. The IWG recommends that for all banks operating in India, CCCB shall be maintained in India.

Recommendation 18

For all banks operating in India, CCCB shall be maintained on solo basis as well as on consolidated basis in India, where appropriate.

(Paragraph 6.7)

Periodic review

0.44 The IWG recognizes that CCCB is a new concept and is untested. Further, it is also likely that it may not be imposed frequently. The indicators and thresholds used by the IWG may either show more robust results in due course of time or may even breakdown. Moreover, there is possibility of emergence of new indicators. Therefore, continuous research and empirical testing may be required and the indicators suggested in recommendation 9 such as House Price Index, RESIDEX, Credit Condition Survey, etc., should be further explored.

Recommendation 19

The indicators and thresholds used for CCCB decisions may be subject to continuous research and empirical testing for their usefulness and new indicators may be explored to support CCCB decisions.

(Paragraph 6.8)

CHAPTER 1

Introduction

1.1 The recent global financial crisis has underscored the importance of capital in build-up of defence against the vicissitudes of financial system and the economic cycles. This aspect attains prime importance as during the crisis, it was observed that arranging of capital became extremely expensive and difficult. It brought forth the fact that shoring up of capital during the period of excess credit growth serves a dual advantage – *on one hand*, it helps moderate excessive credit growth when economic and financial conditions are buoyant, and *on the other*, it provides comfort in terms of additional capital that may be available at times of crises.

1.2 Business entities are generally exposed to economic cycles. In boom times, when there is an economic upswing, demand for their products and services grows exponentially. They do well in their businesses, increase borrowing, create more capacity and make high profits as a result of increased leverage. However, when economic conditions deteriorate, demand for goods and services falls. Business shrinks and entities that are unable to service their loans and liabilities default in meeting their obligations.

1.3 Banking business is no exception to this; rather banks are more prone to economic cycles. Pro-cyclicality, in banking business accentuates the ill-impacts of economic cycles in a feedback loop, i.e., the cycle becomes self-fulfilling, increasing in size and causing externalities to the economy and society.

1.4 In boom times, there is more demand for credit and banks become aggressive, thereby relaxing the credit standards and indulging in excessive credit growth. Debtors do well and service the loans in time. Debtors also improve their financials as also their credit ratings. Banks loan loss ratios are below their long-run average and need for loan loss provisions is less. Banks make good profits as the loan loss provisions are low. Banks also do not need more capital as their borrowers have good credit ratings and as per Basel Capital requirements, high rated borrowers require less capital.

1.5 When the economic cycle turns, borrowers' credit quality tends to worsen, leading to a higher probability of default in servicing interest and principal payment. Some of these loans become non-performing assets (NPAs). Banks' profits start dipping or they may even start making losses thereby resulting in write-off of capital. At the same time, they are required to make higher loan loss provisions for the non-performing loans and maintain higher capital for the rating down-gradation of their borrowers. With their poor financials, banks do not get external capital to support their loan portfolio. This results in banks becoming cautious and restricting lending, thereby resulting in the risk spilling over to the real sector of the economy which needs credit the most. It may cause further spiralling in systemic risk and may lead to economic crisis.

1.6 The issue of pro-cyclicality of bank capital regulation, as shown in various studies[4], dates back to Basel II or to some extent to Basel I days. Repullo and Saurina (2011) have underscored the impact of Basel II capital requirements on pro-cyclicality by showing that the bank capital regulation may amplify business cycle fluctuations [5]. This effect may be more pronounced during downturns, when banks find it difficult to raise additional capital, thereby restricting their lending. Hence, mitigation of the pro-cyclicality of minimum capital requirements is an issue that is engaging the policy makers.

1.7 The G-20, aware of the problem of pro-cyclicality in the capital regulation framework, in its meeting in November 2008, agreed that it was important to address the issue of pro-cyclicality in financial market regulations and supervisory systems. They set five principles for reform of financial markets, of which one was "enhancing sound regulation".

1.8 The G-20 asked the International Monetary Fund (IMF), the Financial Stability Forum (FSF), later renamed the Financial Stability Board (FSB), and the Basel Committee on Banking Supervision (BCBS) to develop recommendations to mitigate pro-cyclicality, including review how valuation and leverage, bank capital, excessive compensation, and provisioning practices may exacerbate cyclical trends.

[4] Kashyap and Stein (2004), Gordy and Howells (2006), and Repullo and Suauz (2009)
[5] Rafael Repullo and Jesús Saurina, The Countercyclical Capital Buffer of Basel III: A Critical Assessment

1.9 Looking at the need for development of tools to address the cyclicality in capital requirement, the Group of Central Bank Governors and Heads of Supervision (GHOS), the overseeing body of the standards set by the Basel Committee, envisaged introduction of a framework on countercyclical capital measures. Their press release dated September 7, 2009 included a commitment to introduce a framework for Countercyclical Capital Buffer (CCCB) above the minimum capital requirement.

1.10 In its consultative document for strengthening the resilience of the banking sector[6], the BCBS (hereafter referred to as Basel Committee) stressed on the need for "…*dampening any excess cyclicality of the minimum capital requirement …*" as also, "…*to achieve the broader macro-prudential goal of protecting the banking sector from periods of excess credit growth …*". For achieving the latter objective, a Macro Variables Task Force (MVTF) was constituted by the Basel Committee.

1.11 The MVTF placed a fully detailed proposal for review by the Basel Committee at its July 2010 meeting[7]. Thereafter, in December 2010, the Basel Committee released a guidance document (*Guidance for national authorities operating the countercyclical capital buffer, December 2010*) providing guidance to national authorities in implementing the countercyclical capital buffer, which in addition, was also likely to help banks understand and anticipate the CCCB decisions in the jurisdictions to which they have credit exposures.

1.12 The Basel Committee, based on empirical evidence, has observed that excessive credit growth builds up system wide risk and prescribed credit-to-GDP ratio as the starting reference point for implementing CCCB. Credit-to-GDP ratio tends to rise in economic boom periods and fall during economic busts. The deviation of the credit to GDP ratio from its long term trend (the credit-to-GDP ratio gap) indicates the build up of excessive credit growth in an economy and system wide risk as a precursor to a crisis. The CCCB should, therefore, be built up when the gap of credit-to-GDP ratio vis-à-vis its long term trend exceeds a certain threshold.

[6]Strengthening the resilience of the banking sector, December 2009
[7] Countercyclical capital buffer proposal – consultative document (BCBS), July 2010

1.13 In this backdrop, the Reserve Bank of India (RBI) set up an Internal Working Group (IWG) on countercyclical capital buffer under the Chairmanship of Shri B Mahapatra, Executive Director. The constitution of the Group was as follows:

Sr. No.	Name	Designation
1.	Shri B Mahapatra, Executive Director	Chairman
2.	Shri Chandan Sinha[@], Principal Chief General Manager, DBOD	Member
3.	Dr Himanshu Joshi, Director, DEPR	Member
4.	Dr A R Joshi, Director, DSIM	Member
5.	Ms Dimple Bhandia[*], GM, FSU	Member
6.	Shri J K Khundrakpam[**], Director, MPD	Member
7.	Shri Puneet Pancholy[+], DGM, DBOD	Member Secretary

@ Shri Chandan Sinha replaced Shri Deepak Singhal.
* Ms Dimple Bhandia replaced Shri Shankar Suman, DGM, FSU.
** Shri J K Khundrakpam replaced Dr. D P Rath, Director, MPD.
+ Shri Puneet Pancholy replaced Shri Rajinder Kumar, GM, DBOD.

1.14 The broad terms of reference of the IWG are as under:

(i) Assess the appropriateness of credit-to-Gross Domestic Product (GDP) gap as suggested by the Basel Committee as a basic input to the Countercyclical Capital Buffer framework in India.

(ii) Identify supplementary indicators that may be used in addition to the credit-to-GDP gap to confirm that the credit growth is really excessive in relation to GDP growth and also for assessing the build-up of system-wide risk in the Indian context at any point in time.

(iii) Define 'Aggregate Credit' in the Indian context and identify reliable sources of data for the same.

(iv) Work out operational details of the framework.

1.15 The IWG places on record, its appreciation for Shri Anirban Basu, AGM, DBOD, RBI for coordinating the data collection, preparing background material and providing various inputs to the IWG. The IWG also acknowledges the excellent support provided by Shri Bhaskar Birajdar, Assistant Adviser, DSIM, RBI in carrying out the empirical work.

1.16 The Report is organized as follows. Chapter 2 reviews the theoretical underpinnings of the countercyclical capital buffer, detailing the Basel Committee recommendations and guidance and provides a backdrop to the subsequent chapters. Chapter 3 highlights the role of credit-to-GDP gap in Indian context. Chapter 4 enumerates the role of supplementary indicators in the CCCB framework. Chapter 5 talks about the release phase of the CCCB. Chapter 6 discusses other issues that are relevant to CCCB framework in India. The Report also has two annexes. Annex I details an illustrative mechanism to calculate the CCCB. Annex II illustrates calculation methodology of bank specific buffers.

CHAPTER 2

Major Recommendations of the Basel Committee

2.1 One of the key take-aways from the recent global financial crisis was the importance of cyclicality of the capital charge. During the time of economic downturn, where on one hand, there is erosion in bank's equity due to write-offs and downgrading of many borrowers, on the other there is an increased demand to arrange for additional capital to maintain credit flow. Further, it has been observed that during such times, arranging for fresh capital is not only expensive but extremely difficult.

2.2 In this backdrop, a need was felt to develop tools to address the pro-cyclicality in capital requirement and consequently, the Group of Central Bank Governors and Heads of Supervision (GHOS) decided to introduce a framework for Countercyclical Capital Buffer (CCCB) above the minimum regulatory capital requirement.

2.3 Thereafter, in its consultative document on strengthening the resilience of the banking sector, the Basel Committee stressed on the need for "dampening any excess cyclicality of the minimum capital requirement" as also, "to achieve the broader macro-prudential goal of protecting the banking sector from periods of excess credit growth". For achieving these objectives, based on the proposals of the Macro Variables Task Force (MVTF), the Basel Committee, in December 2010, released a document to provide national authorities operating the CCCB, guidance in implementing the CCCB decision. The document is also likely to help banks understand and anticipate the CCCB decisions in the jurisdictions to which they have credit exposures.

2.4 The CCCB envisages consistency in capital maintained by the banking sector with the macro-financial environment in which the banks operate. During times of excessive credit growth that lead to a build-up of system-wide risk, this buffer acts as an important macro-prudential tool with the regulator that can be deployed to ensure that the banking system accumulates sufficient capital to protect itself against future potential losses. Looking at the global experience, it is observed that the credit cycles are long (generally 10-12 years), and hence, it is highly unlikely that the CCCB may be operated frequently. As mentioned in the Basel Committee's consultative document on CCCB, "…*This focus on excess aggregate credit growth means that jurisdictions are likely to only need to*

deploy the buffer on an infrequent basis, perhaps as infrequently as once every 10 to 20 years".

2.5 The CCCB regime ensures that not only do the individual banks remain solvent through a period of stress, but also provides a safeguard to the banking sector during such periods in the form of additional capital on hand to help maintain the flow of credit in the economy without its solvency being questioned. Further, as an additional benefit, during a period of excessive credit growth, the CCCB may act as a moderator as it is likely to raise the cost of credit, and therefore, dampen its demand. It is important to mention here that though the CCCB is a macro-prudential tool available with the regulator, the Basel Committee had not envisaged it as an instrument to manage economic cycles or asset prices, which can be best addressed through fiscal, monetary and other public policy actions. Having said that, it may also be mentioned that operation of the CCCB has implications for the conduct of monetary and fiscal policies.

2.6 The Basel Committee enunciated a few principles to guide national authorities in the CCCB framework.

2.6.1 *Principle 1: **(Objectives)** Buffer decisions should be guided by the objectives to be achieved by the buffer, namely to protect the banking system against potential future losses when excess credit growth is associated with an increase in system-wide risk.*

2.6.2 *Principle 2: **(Common reference guide)** The credit-to-GDP gap is a useful common reference point in taking buffer decisions. It does not need to play a dominant role in the information used by authorities to take and explain buffer decisions. Authorities should explain the information used, and how it is taken into account in formulating buffer decisions.*

2.6.3 *Principle 3: **(Risk of misleading signals)** Assessments of the information contained in the credit to GDP gap and any other guides[8] should be mindful of the behaviour of the factors that can lead them to give misleading signals.*

[8] The Basel Committee has suggested some variables that may be useful indicators to support inferences from the credit-to-GDP guide in both the build-up and release phases of the CCCB decisions. These indicators may include indicators such as various asset prices, funding spreads and CDS spreads, credit condition surveys, real GDP growth and data on the ability of non-financial entities to meet their debt obligations on a timely basis.

2.6.4 *Principle 4:* ***(Prompt release)*** *Promptly releasing the buffer in times of stress can help to reduce the risk of the supply of credit being constrained by regulatory capital requirements.*

2.6.5 *Principle 5:* ***(Other macro-prudential tools)*** *The buffer is an important instrument in a suite of macroprudential tools at the disposal of the authorities.*

Countercyclical Capital Buffer indicators

2.7 For developing a CCCB framework, Basel Committee has recommended a common reference guide based on the credit-to-GDP gap[9]. The Basel Committee has empirically tested and observed that across time and over a cross section of countries (including both developed countries and emerging countries) this ratio would have been a useful indicator of the build-up of system-wide risk in the past. The regulators have also been provided flexibility to calibrate the CCCB in a way that meets the requirement of their jurisdictions. Moreover, instead of depending totally on one indicator, the Basel Committee has suggested a few supplementary indicators that may be used in conjunction with the credit-to-GDP gap. However, for the CCCB decision, the regulators are expected to apply judgement after using the best information available to gauge the build-up of system-wide risk. The subsequent paragraphs cover the various indicators that may be used while calibrating the CCCB.

A. Credit-to-GDP gap

2.8 The Basel Committee, based on empirical evidence, has prescribed credit-to-GDP gap as a useful starting reference point for implementing the CCCB. Intuitively, this indicator seems to have an inherent advantage as it is based on credit which aligns with the broader macro-prudential goal of CCCB, viz., protecting the banking sector from periods of excessive credit growth. In addition to credit-to-GDP gap, authorities in each jurisdiction may use other variables and qualitative information which they feel is useful for purposes of assessing the sustainability of credit growth and the level of system-wide risk, and also in taking and explaining CCCB decisions. The authorities may also use various other macro prudential tools available with them, as also sectoral measures to protect the economy from excessive credit growth.

[9] Credit-to-GDP gap is the difference between the ratio of credit-to-GDP with that of the long term average ratio of credit-to-GDP.

2.9 The BCBS paper[10] has outlined an extensive analysis of the properties of credit-to-GDP gap and other variables. The credit-to-GDP gap was the best performing amongst these variables. The reasons cited in the paper are as under:

" …

First, business and financial cycles are related, but fluctuations in output have a higher frequency than those of financial cycles associated with serious financial distress. Episodes of financial distress are rare and reflect longer and larger cycles in credit and asset prices.

Second, credit related variables perform very well. In particular, the credit-to-GDP ratio tends to rise smoothly well above trend before the most serious episodes. The specification of the credit-to-GDP gap has a number of advantages over credit growth. Being expressed as a ratio to GDP, the indicator variable is normalised by the size of the economy. This means it is not influenced by the normal cyclical patterns of credit demand. Being measured as a deviation from its long-term trend, the credit-to-GDP gap allows for the well-known secular financial deepening trend. Being a ratio of levels, it is smoother than a variable calculated as differences in levels, such as credit growth, and minimises spurious volatility (no large quarter-to-quarter swings).

…"

2.10 The prescribed CCCB guide has used a broad definition of credit that would capture all sources of debt used by the private sector to calculate a starting CCCB guide. This broad definition of credit endeavours to capture all sources of finances availed by the private sector. The data should include all credit extended to households and other non-financial private entities in an economy (credit extended by domestic and international banks as well as non-bank financial institutions), outstanding debt securities issued domestically or internationally to fund households and other non-financial private entities (corporate bonds). This would also include securities held by banks and other financial institutions in their trading portfolios and banking books as well as securities held by other residents and non-residents.

2.11 The guidance note also allows flexibility to the jurisdictions that do not have credit aggregates in terms of allowing them to initially use the broad aggregates available and widen the coverage of credit in the future.

[10] "Guidance for national authorities operating the countercyclical capital buffer" BCBS, December 2010

Supplementary indicators

2.12 Presently, not many countries have evolved CCCB framework, so there is no unanimity on an alternative indicator[11] that may substitute credit-to-GDP ratio as the primary indicator in the CCCB decision. However, there are some studies carried out in this area that have questioned the appropriateness of the credit-to-GDP gap. Even the BCBS guidance document, while advocating credit-to-GDP indicator as the common reference point in taking CCCB decisions, cautioned that "... *(Risk of misleading signals) Assessments of the information contained in the credit/GDP guide and any other guides should be mindful of the behaviour of the factors that can lead them to give misleading signals".*

2.13 In using the credit-to-GDP ratio, any reduction in denominator, say, purely due to a cyclical slowdown or outright decline in GDP may inflate the ratio indicating build-up of system-wide risks. Further, the long term average of credit-to-GDP ratio may not accurately capture the turning points and hence, CCCB decision may require other indicators, as also judgement of the national authorities. Also, in their criticism of the credit-to-GDP guide, Repullo and Saurina[12] have said that there is empirical regularity that credit usually lags the business cycle. In particular, in downturns, the credit-to-GDP ratio continues to be high due to greater credit demand by households and firms (making use of credit lines, partly to finance inventory accumulation) and a slower, sometimes even negative, GDP growth. Also, the use of deviations of the credit-to-GDP ratio with respect to its trend compounds the problem, because it takes some time before the ratio crosses the trend line. It is also felt that a micro-oriented supervisor concerned about bank failures would naturally be averse to reducing capital requirements in a downturn. Even if the national authorities decide to release the CCCB due to the worsening of economic conditions, financial markets might react very negatively to such a decision to release the CCCB.

2.14 Though there are limitations of credit-to-GDP gap that have been cited in some literature, these are more of country specific observations. Of course, literature that supports the credit-to-GDP gap is also available in public domain. More importantly,

[11] On February 13, 2013, the Federal Council of Switzerland imposed CCCB based on proposal of the Swiss National Bank (SNB). The proposed capital buffer is targeted at mortgage loans financing residential property located in Switzerland. The proposal sets a level of 1% of associated risk-weighted positions, and a deadline for compliance with the CCCB of September 30, 2013.

[12] "The countercyclical buffer of Basel III a critical assessment", Rafael Repullo and Jesus Saurina, March 2011.

apart from using credit-to-GDP indicator, the guidance document has suggested use of some supplementary indicators that may be used by the national authorities to assess the consistency of the inferences derived from the credit-to-GDP gap.

The following paragraphs list some of the supplementary indicators that may be considered during the CCCB decision.

B. Various asset prices

2.15 Different variables that could be used as indicators for the CCCB were considered by Drehmann *et al* (2011). Asset prices including financial assets and property prices are the two categories of assets that may be used as a proxy for market risk as these show exceptionally strong growth in periods that precede systemic banking events.

2.16 Asset price and credit extension are closely related. Easy credit lowers the rate of interest thereby increasing the present value of the discounted stream of cash flow from the asset, which may result in appreciation in its price. Further, higher asset price may result in higher credit off-take considering the fact that the asset may be used as collateral. Hence, this may be a useful indicator to assist national authorities during CCCB build-up phase. However, as the deviations from the long-term trend may tend to narrow prior to the emergence of financial strains, this may not serve as a useful indicator during release phase as the authorities may start releasing the CCCB too early.

C. Funding spreads and CDS spreads

2.17 The spreads are indicators of build-up of stress/vulnerability in the system. Various spreads that may be considered include:

2.17.1 Banking sector credit spreads - Credit spreads indicated by the CDS spreads of various banks or an index, are an important source of information on the build-up of vulnerabilities in the banking sector (in the sense of the market assessment of the risk of bank failures). Of the two, indices of credit spreads are more reliable than single name CDS as it is possible to manipulate single name CDS of banks. However, it was observed during the recent financial crisis that the CDS market tends to freeze during a severe downturn / recession and hence, this indicator may have limited utility during such periods.

2.17.2 Cost of liquidity – The impact of funding liquidity on health and functioning of the banks was well evident during the recent crisis. Cost of liquidity is an indicator of the aggregate funding conditions in markets. It is the average cost that the banking sector has to pay to raise short-term liquidity. Liquidity strains are visible during the times of crises, and may provide useful inputs during the transition from good to bad times. Of course, such cost is modulated by presence of the monetary authority, especially, during times of stress. The cost of liquidity may be proxied by market based spread such as LIBOR-OIS spread, though it is important to note from recent experience that LIBOR, being a polled rate, is subject to manipulation.

2.17.3 Corporate bond spreads - This is an indicator of credit quality for the economy. The spreads also indicate the levels of credit risk and higher spreads are representative of stressed periods and *vice-versa*. Spreads can also be viewed as indicators of the average cost of borrowing in the economy, including banks, and thus be used in a tool that targets the smoothing of funding costs.

D. Credit condition surveys

2.18 Credit conditions survey, or senior loan officers' survey, as it is known in many countries, provides valuable inputs on the emerging conditions in the credit market demand directly from the officers dealing with the loan proposals at the commercial banks. Loan demand from different sectors of the economy is captured through these surveys, which provides the otherwise uncovered portion of the market condition.

2.19 When used in conjunction with actual credit data and the other information such as industrial outlook surveys, and corporate sector profitability, the combined information set is rich enough to provide a judgment about the present status of the credit market and the borrowers, and its likely direction in the near future.

E. Real GDP growth

2.20 One of the most important objectives of the CCCB proposals is to smoothen the business cycle (Drehmann et al, 2011). The natural indicator for assessing the overheating of the economy is the above-trend growth in real GDP. Rapullo and

Saurina (2011) argue that real GDP growth would be an important indicator for assessing the requirement of CCCB.

2.21 However, there are counter-arguments which suggest that the business cycles and credit cycles are not necessarily coincidental. According to Koopman and Lucas (2005), the frequency of a typical business cycle is 4-8 years, while credit cycles have much longer durations. These arguments show that the real GDP growth may not be an ideal indicator for prescription of CCCB.

2.22 Nevertheless, the contribution of robust real GDP growth on likely stress on the banks cannot be under-estimated. Therefore, while the real GDP growth may not serve as a primary indicator for CCCB activation, it should form part of the information set which is considered by the authorities for making the CCCB decisions.

F. Data on the ability of non-financial entities to meet their debt obligations on a timely basis

2.23 The corporate sector's inability to repay its debt liabilities may be an indicator of the problems associated with economic downturn and may adversely impact the banks. Therefore, a measure of corporate sector's debt servicing ability is an important indicator for any CCCB decision. The interest coverage ratio (ratio of interest payments to EBIDTA) is a good candidate variable for this purpose. However, the main drawback of this indicator in its raw form is that it is greatly influenced by the market interest rates. In a high interest rate scenario which could itself be due to counter-cyclical monetary policy measures, this ratio would deteriorate, indicating the growing stress in the corporate sector. This being the result of a conscious policy measure could not possibly be taken as an input. However, this may be a useful indicator, if the stress can be evident even after accounting for the impact of monetary policy.

G. Aggregate real credit growth

2.24 This is a useful indicator as during periods of high growth, there is a rapid credit expansion, whereas during times of stress, credit off-take declines. This measure would include credit from all sources including banks.

H. Banking sector profits

2.25 Banking sector profits are high in good times and lower during the times of stress. This indicator may provide useful inputs to help identify build-up / release of stress in the system. However, the performance of bank (pre-tax) profits as a signal for the build-up in good times appears to be somewhat uneven. The variable worked very well for the United States and United Kingdom during the current crisis as also for Spain in the early 1990s. However, it performed poorly otherwise, e.g., in the more recent experience in Spain. Incidentally, this could have been due in part to changes in accounting practices, including the introduction of dynamic provisioning (Drehmann et al, 2011).

I. Non-Performing Assets

2.26 Non-Performing Assets (NPAs) are closely related to the economic cycles and are accentuated during periods of stress. In fact, the cycle is frequently identified by the rise and fall of the realised losses. This indicator is useful to assess the transition from good period to periods of stress. However, it may not be a useful indicator during building up of buffers in good times, as it will not differentiate between the intensity of the good times, and may lead to significantly higher buffers. However, NPA build-up may provide useful inputs to calibrate the CCCB decision in the release phase of the CCCB.

Determining threshold

2.27 The efficacy of the CCCB decision depends upon calibration of the threshold levels of the credit-to-GDP gap, so as to meet the objective of the CCCB. While calibrating, the authorities have to ensure that on one hand, the banking system should be protected from periods of excess credit growth, while on the other, to make capital available to the banking system during period of stress. The Basel Committee has recommended two threshold levels of the credit-to-GDP gap - lower threshold level, L, when the capital buffers build-up should be activated and the upper threshold, H, which is the level at which the CCCB attains maximum value. The decision to implement a different CCCB add-on than indicated by the Basel Committee guide has been left in the hands of national authorities, subject to providing a public and transparent explanation of the decision.

2.28 The Basel Committee recommended that the minimum threshold (L), when the guide would start to indicate a need to build up capital, should be low enough, so that

the banks get adequate time for the same. Further, as the banks are to be given one year to raise additional capital, there is likelihood that the indicator may breach the minimum threshold at least 2-3 years prior to a crisis. However, 'L' should be high enough, so that during normal times, it should not indicate additional capital requirement.

2.29 As regards maximum threshold level, 'H', beyond which no additional capital would be required, even if the gap continues to increase, the Basel Committee has recommended that it should be low enough, so that the banks operate at maximum CCCB i.e., 2.50 per cent of risk-weighted assets prior to major banking crises.

2.30 After empirical studies across various countries, the Basel Committee has recommended values of 'L' and 'H' to be 2 percentage points and 10 percentage points, respectively, with an objective to build up buffers a few years ahead of crisis and no CCCB requirement during normal times when the gap is mostly zero. The Basel Committee also observed that "*L=2 and H=10 provide a very robust trade-off between type 1 errors (a crisis occurs but the gap does not breach the threshold) and type 2 errors (the threshold is breached but no crisis occurs)*".

2.31 For any other value of the credit-to-GDP gap between 2 and 10 percentage points, the Basel Committee has recommended that the CCCB will vary linearly between 0 and 2.5 per cent of risk-weighted assets.

Performance of variables for signalling release of the CCCB

2.32 The release of the CCCB may be warranted under typical circumstances where either there are losses in the banking system or there are systemic issues. In the case of the former, the CCCB may be released so that it is used for absorbing the losses before the banks begin depleting their normal capital conservation buffers. In the case of the latter where problems elsewhere in the financial system are causing disruption to the flow of credit, thereby impacting the growth adversely, the release of CCCB should be immediate to stem the crisis from impacting the banking system and resultant losses therein. It is therefore essential that variables guiding the release phase react promptly.

2.33 The Basel Committee observed that macro variables may not be ideal indicator variables for signalling the release phase. It also mentions that indicators of banking sector conditions such as aggregate profits, non-performing loans, etc. provide mixed signals for the release phase. Though asset prices are useful indicators as their frequency of availability is higher than quarterly macro data or information from bank balance sheets (which may only be available annually in some cases), these may actually result in releasing the CCCB too early. However, these are useful in explaining the need to release the CCCB after the financial system comes under stress.

2.34 Spreads such as CDS spreads, funding cost, etc., can emerge as alternative market based indicators especially as they were able to capture the onset of the recent crisis. In any case, corporate credit spreads may not be considered as a useful indicator as their correlation with systemic banking crises is yet to be established. The historical evidence for the TED spreads is also ambiguous.

Treatment of surplus when CCCB returns to zero

2.35 As per the BCBS recommendations, when the CCCB is turned off, the capital surplus created should be unfettered, i.e., there should be no restrictions on distribution of this surplus. In the situation when the CCCB is made zero, banks may prefer to use this capital to absorb losses or protect themselves against the impact of problems elsewhere in the financial system. However, the final decision on the use of this surplus rests with national authorities.

Jurisdictional reciprocity

2.36 The Basel Committee has observed that jurisdictional reciprocity in CCCB framework would ensure level playing field between domestic and foreign banks in a jurisdiction. Jurisdictional reciprocity entails that capital requirement under CCCB framework should be based on the exposures pertaining to the host jurisdiction. However, the power to set and enforce CCCB will ultimately rest with the home authority.

2.37 The host jurisdiction should ensure that all the banks operating in its jurisdiction (whether locally incorporated or incorporated in a foreign jurisdiction) are meeting the CCCB requirements for all the exposures in that jurisdiction. It should also be

communicated to the supervisor of the home jurisdiction of the foreign incorporated banks so that such banks can be supervised for adequacy of CCCB by their home supervisors also.

2.38 However, if it is felt that the CCCB requirement of a host jurisdiction is inadequate, the home jurisdiction may impose higher CCCB requirement for the banks they supervise. Moreover, it is also important that the home supervisor should not stipulate lower CCCB requirement for its banks operating in the host jurisdiction as it may distort the level playing field between the domestic and foreign banks in host jurisdiction. Further, it may also discourage implementation of CCCB. In case the host jurisdiction does not have CCCB requirements, the home jurisdiction may stipulate CCCB requirements for exposure of its banks in that jurisdiction, based on the available relevant data.

Frequency of buffer decisions and communications

2.39 The Basel Committee has recommended that the CCCB decision be preannounced with a lead time of upto 12 months so as to give banks a reasonable amount of time to adjust their capital plans.

2.40 The Basel Committee observed that as the CCCB in each jurisdiction is likely to be used infrequently, instead of making quarterly statements on buffer decision on an on-going basis, the authorities may comment at least on an annual basis. More frequent communications may be conducted, when any action on implementation of CCCB is taken or when there are significant changes to the authorities' outlook for the prospect of changes to CCCB settings.

Interaction with Pillar 1 and 2

2.41 The CCCB incorporates elements of both Pillar 1 and Pillar 2. Like Pillar 1 approach, CCCB has pre-determined rules and disclosure requirements. It is akin to Pillar 1 approach in that it is a framework consisting of a set of mandatory rules and disclosure requirements. But CCCB also incorporates judgement and discretion in setting buffer levels, as also, in terms of explanation by authorities on CCCB actions.

2.42 As far as capital for Pillar 2 is concerned, the Basel Committee observed that Pillar 2 capital requirements capture additional risks that are not related to system-wide

issues. Hence, capital required for the CCCB should not be allowed to be used for such other risk elements under Pillar 2.

Location of the CCCB

2.43 Host authorities would have the right to demand that the CCCB be held at the individual legal entity level or consolidated level within their jurisdiction. If they do not exercise that right, the home authorities of the consolidated parent must ensure that the CCCB is held at the consolidated parent level.

Selecting the authority to operate the CCCB

2.44 The Basel Committee noted that CCCB will have implications for the conduct of monetary and fiscal policies, as well as banking supervision and hence, for CCCB decision, the most critical inputs shall be the prevailing supervisory and macroeconomic information. Due to such variations in the institutional arrangements across various jurisdictions, the issue of relevant authority to operate the CCCB has been left to the discretion of each jurisdiction by the Basel Committee.

CHAPTER 3

Empirical Work for CCCB Framework for India

3.1 India's financial system has been dominated by banks which are the main channel for providing credit to the economy. Whenever the Reserve Bank of India considers increased likelihood of build-up of asset bubble, monetary policy has been the major instrument in tempering the credit growth (Gopinath, 2010 and Sinha, 2011). In the past, the conduct of macro-prudential policies and deployment of sectoral risk weights, etc., were largely based on aggregate credit growth and incremental credit–deposit ratio used with policy makers' judgment, rather than disaggregated statistical analysis (Gopinath, 2010). The sectoral approach adopted in India towards counter-cyclical policies has stood the test of time and the RBI has indicated its preference to continue the same on several occasions (Subbarao, 2010).

3.2 However, in India, the utility of aggregate credit to indicate systemic risk build-up has its own limitations. This is due to the fact that credit growth in India, unlike in advanced countries, could be reflective of several factors that may include initiatives like flow of credit to priority sectors like agriculture, small and medium enterprises, financial inclusion and the resulting financial deepening, rising efficiencies of the credit market, etc. (Chakraborty, 2011). These factors are likely to result in structural shift in credit-to-GDP ratio.

3.3 The structural shift in the credit-to-GDP ratio has been observed and taken into account while choosing the sample period for the study conducted by the IWG. However, the changes in the credit-to-GDP ratio have been taking place gradually as the economy is absorbing the policy changes and adapting to the financial deepening. Moreover, excessive credit growth, which is beyond the absorptive capacity of the productive sectors, has always been seen with circumspection by the Reserve Bank of India. Such instances have prompted the Reserve Bank of India to activate the counter-cyclical policies, *albeit* at a sectoral level.

3.4 Such sector specific approaches may be necessary to tackle the build-up of credit to a particular sector. However, it is likely that the overall credit growth may at times exceed the genuine demand for investment that may result in undesirable outcomes. These outcomes could be in the form of build-up of systemic risk.

3.5 Hence, any increase in overall credit growth beyond its long term trend may have to be addressed with counter-cyclical policies prescribed by the Basel Committee in the form of various prescriptions, including CCCB. In other words, looking at our country specific requirements, CCCB may have to work in conjunction with sectoral approaches.

3.6 The IWG had to ensure that the CCCB calibration is such that the credit growth does not get choked. Also, the IWG felt that the Basel framework needed to be tested in Indian conditions, and if required, suitable modifications may be made to the framework. In its analysis, the IWG has tried to dovetail the CCCB framework prescribed by the Basel Committee to Indian conditions.

3.7 In this context, it may be mentioned that the Basel Committee's framework of "comply or explain" provides freedom to the national authorities to deviate from the standard prescriptions of the Committee. But in case a jurisdiction chooses to "explain" the deviation from the given framework, the uncertainty of perception of the markets and international community about the explanation provided by the national authorities poses a major challenge for the authorities (Subbarao, 2011 and Sinha, 2011).

3.8 The Basel Committee, based on empirical evidence, has prescribed credit-to-GDP gap as a useful starting reference point for implementation of the CCCB decision. Furthermore, by being based on credit, it has the significant advantage over many of the other variables of appealing directly to the objective of the countercyclical capital buffer, which is to achieve the broader macro-prudential goal of protecting the banking sector from periods of excess credit growth.

3.9 The Basel Committee recognizes the fact that the credit-to-GDP gap may not always work in all jurisdictions at all times. However, for evolving the CCCB framework, it is expected that the national authorities would be transparent.

3.10 On the issue of the authority that will operate CCCB, the Basel Committee has left the discretion to respective jurisdictions. The IWG noted that the relevant authority to operate CCCB would require relevant and current supervisory and macroeconomic information. The CCCB decision will have implications for the conduct of monetary policy on one hand and supervision function on the other. The IWG felt that RBI would be better placed in conducting a detailed assessment of prevailing supervisory and macroeconomic information, as in India, these functions and information are vested with

the RBI. The IWG recommends that the RBI shall be the authority to operate and communicate the CCCB decision.

3.11 Though the CCCB is to be applied only to the banks, the definition of credit used for operating the CCCB decision is broad based and comprises credit from all sources including foreign sources. The IWG carried out the empirical work to determine the possible indicators which could be used for CCCB decision by the Reserve Bank of India.

Coverage of Credit

3.12 Financial resources to commercial sector are available from various sources, in the form of credit or equity. The following table (Table-1) lists not only credit flows but different sources of credit and also equity flows to the commercial sector.

Table 1 : Flow of Financial Resources to the Commercial Sector (₹ billion)					
		April–March			
		2009-10	2010-11	2011-12	2012-13
1		2	3	4	5
A.	Adjusted Non-Food Bank Credit (NFC)	4,786	7,110	6,773	6,849
	i) Non-Food Credit	4,670	6,815	6,527	6,335
	of which: petroleum and fertiliser credit	100	-243	116	141
	ii) Non-SLR Investment by SCBs	117	295	246	514
B.	Flow from Non-Banks (B1+B2)	5,850	5,341	5,383	7,335
	B1. Domestic Sources	3,652	3,011	3,079	4,212
	1. Public issues by non-financial entities	320	285	145	119
	2. Gross private placements by non-financial entities	1,420	674	558	1,038 p
	3. Net issuance of CPs subscribed to by non-banks	261	68	36	52
	4. Net Credit by housing finance companies	285	428	539	859
	5. Total gross accommodation by 4 RBI-regulated AIFIs: NABARD, NHB, SIDBI & EXIM Bank	338	400	469	515
	6. Systemically important non-deposit taking NBFCs (net of bank credit)	607	795	912	1,188
	7. LIC's net investment in corporate debt, infrastructure and social sector	422	361	419	441
	B2. Foreign Sources	2,198	2,330	2,304	3,123
	1. External Commercial Borrowings/FCCBs	120	555	421	466
	2. ADR/GDR Issues, excluding banks and financial institutions	151	92	27	10
	3. Short-term credit from abroad	349	502	306	1,177
	4. Foreign Direct Investment to India	1,578	1,181	1,550	1,470
C.	Total Flow of Resources (A+B)	10,636	12,451	12,156	14,184
Memo:					
Net resource mobilisation by Mutual Funds through Debt (non-Gilt) Schemes		966	-367	-185	830
P: Provisional.					

(Source: Macro Economic and Monetary Development July 29, 2013*)*

3.13 While it is recognized that a wide definition of credit would be ideal for the empirical exercise, the availability of long time series is necessary to identify the suitability of the indicators for CCCB decisions. Given that the GDP data is available at quarterly frequency, the IWG decided to use the same frequency for other data sets also. Further, the IWG felt that availability of reliable time series data for sufficient length of time may determine whether a particular component of credit or indicator would be used for analysis.

3.14 In its analysis, the IWG perused publicly available data on various components of credit. However, it was observed that long time series of data at quarterly frequency were not available from their respective sources for some of the variables, viz., (i) loans by housing finance companies (HFC), (ii) loans by Non-bank finance companies (NBFC), (iii) issue of commercial paper (CP), and (iv) issue of bonds by corporate sector.

3.15 Further, the components, viz., (i) debt papers issued by corporates, and (ii) credit from foreign sources, i.e., external commercial borrowings and foreign currency convertible bonds were not available for sufficiently long historical period, on a consistent basis. Therefore, the IWG considered that outstanding credit by Scheduled Commercial Banks including RRBs would be an appropriate credit aggregate for the purpose of empirical analysis.

3.16 For credit aggregate comprising outstanding credit by Scheduled Commercial Banks including RRBs, the data on bank credit was available for a long period, as far back as the mid-1990s. However, similar time series was not available for some of the other variables used by the IWG in its analysis, such as Gross NPA (GNPA) growth, etc. Hence, the IWG decided to use time series data from March 2001 onwards for the present exercise.

3.17 In India, availability of the GDP data at quarterly frequency is relatively recent, with official data available only from 1996-97. Consistent series of quarterly GDP is available only for the base year 1999-2000. In order to maintain consistency and avoid break in series at the change of base year, data for the recent years, viz., 2009-10 to 2011-12 was re-computed for the 1999-2000 series using the latest available actual data and growth rates for the subsequent period. Data on GDP was sourced from Handbook of Statistics on Indian Economy[13].

3.18 The GDP data also had substantial seasonal variation, which needed to be taken into account before computing the credit-to-GDP ratio. Therefore, the standard method of seasonal adjustment to the data, viz., X12-ARIMA (Auto-Regressive Integrated Moving Average) was used.

[13] See http://www.rbi.org.in/scripts/AnnualPublications.aspx?head=Handbook of Statistics on Indian Economy

3.19 For determining thresholds for CCCB framework, the IWG had the option of adopting the framework suggested by the Basel Committee, as already discussed in Chapter 2.

3.20 However, looking at India specific circumstances, especially the stage of economic development, the degree of maturity of financial markets, the institutional framework and the process of structural transformation underway, it was felt that these thresholds should be assessed using India-specific data, and if required, be recalibrated.

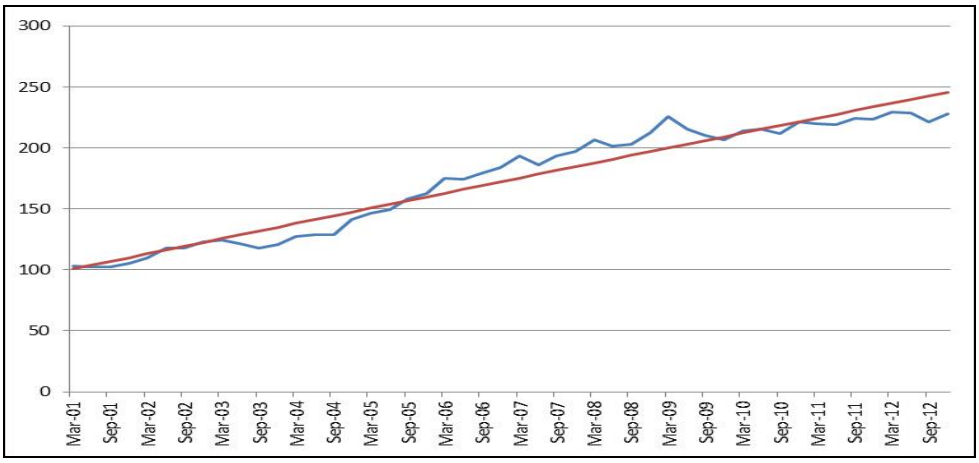
3.21 For measuring credit-to-GDP gap, Basel Committee has recommended the use of one-sided Hodrick-Prescott (HP) filter with the lambda factor of 400000 to estimate the long term trend of credit-to-GDP ratio. While HP filter is a popular method of estimating trend component of economic time series, it has been found to have certain limitations, which are discussed in Vuuren (2012). There are primarily two issues where differences of opinion are found in the literature, one about the value of smoothening parameter lambda and other about using one-sided or two sided filter. The one sided filter uses only the data upto the particular point in time series, for which trend value is being estimated, while the two-sided filter uses the entire sample. The commonly used values of lambda for quarterly and annual data are 1600 and 100 respectively. As the lambda increases the HP filter trend moves closer to a linear trend in standard two-sided HP filter. The trend would not be, however, linear in the suggested one-sided implementation.

3.22 Looking from the policy perspective, use of data upto the relevant time point is most appropriate, as one cannot be expected to base decisions based on numbers that will be estimated using future values. However, when implementing the HP filter for post-facto analysis, two-sided filters are commonly used. The process of implementing one-sided filter is iterative in nature and is more intensive. On the other hand, while using one-sided filter, there are a few empirical issues that are faced. As the sample size is increased by one point for each iteration, the final trend series estimated using this procedure will be based on samples of varying size for each point. Further the sample for the initial points in the time series is very small. Therefore, to work out a reasonably useful trend using one-sided HP filter would require a long time series. Given the limitations of data availability, particularly the quarterly GDP (before 1996-97) and other related variables (before 2001-02), using one-sided filter was not feasible.

The IWG recognized this as a limitation and decided to proceed with use of two-sided HP filter for the purpose of analysis.

3.23 The following chart (chart 1) plots movement of credit-to-GDP ratio against the long term credit-to-GDP trend. The difference between the two at any point in time would be the credit-to-GDP gap.

Chart 1: Credit-to-GDP ratio and credit-to-GDP trend



3.24 The credit-to-GDP gap exhibited a cyclical pattern on expected lines. However, given the data constraint, the sample period was short and hence, not many complete cycles could be seen in the graph.

3.25 The analysis carried out using credit-to-GDP ratio and the credit-to-GDP gap could not provide substantial input for calibrating the CCCB. This may be due to the following reasons:

3.25.1 In a structurally transforming economy with rapid upward mobility, growth in credit demand will expand faster than GDP growth for several reasons:

- India will shift increasingly from services to manufacturing whose credit intensity is higher per unit of GDP,
- India needs to double its investment in infrastructure which will place enormous demand on credit, and
- Impetus to Government and RBI's financial inclusion programme will bring millions of low income households into the formal banking system with almost all of them needing credit.

3.25.2 Inferences from credit-to-GDP gap may be misleading as it will be difficult to identify what and how much is due to structural transformation and how much is due to excessive credit growth. Triggering the CCCB too early out of excessive caution may involve sacrifice of growth. On the other hand, complacency and failure to trigger buffer decision may lead to build up of pressure.

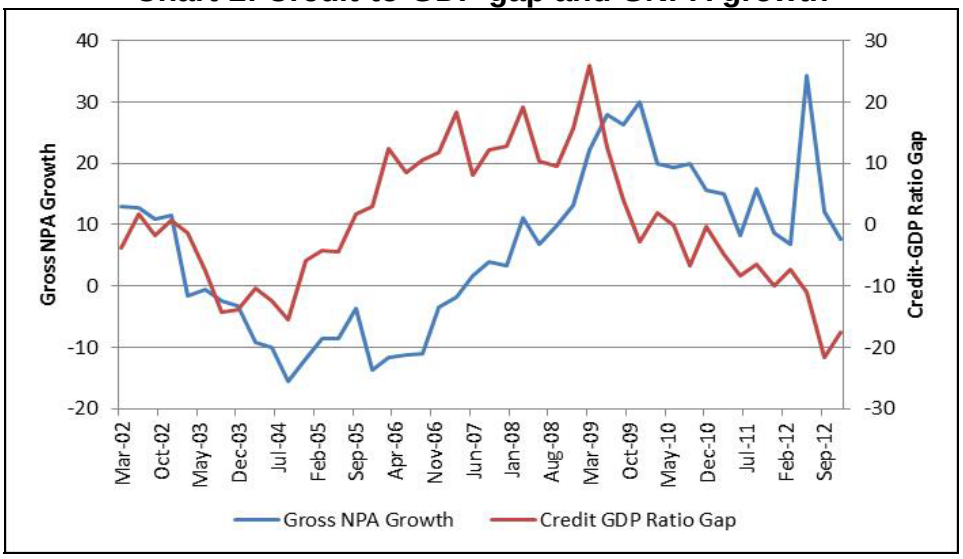
3.26 As credit-to-GDP gap, on its own, failed to provide guidance on the CCCB framework, the IWG used GNPA data along with the credit-to-GDP data for this purpose. NPAs, as already mentioned in the Chapter 2, are closely related to the economic cycles and are accentuated during periods of stress. The IWG felt that the systemic risk can be captured best by viewing the movement of GNPAs of the banking system. Accordingly, the threshold calculation is based on the relationship between the credit-to-GDP gap and the growth of GNPAs of the banking system.

3.27 As the CCCB should be turned on before the onset of systemic risk, it is necessary to determine the empirical lag at which the credit-to-GDP gap should be assessed with respect to the materiality of the systemic risk.

3.28 This analysis was carried out using quarterly data that covers a period from Q3 of 2001 until Q4 of 2012. As the data for nominal credit and GDP used is of quarterly frequency – the credit-to-GDP ratio has been de-seasonalised using the X12 method of the US Bureau of census. The said ratio is then filtered using the two-sided HP filter using the standard value of λ =400000.

3.29 Chart-2 presents the plot of credit-to-GDP gap and the annual growth of GNPA of the banking industry in India. The chart clearly demonstrates presence of pro-cyclicality in the two series in question, albeit with discernible lags.

Chart-2: Credit-to-GDP gap and GNPA growth



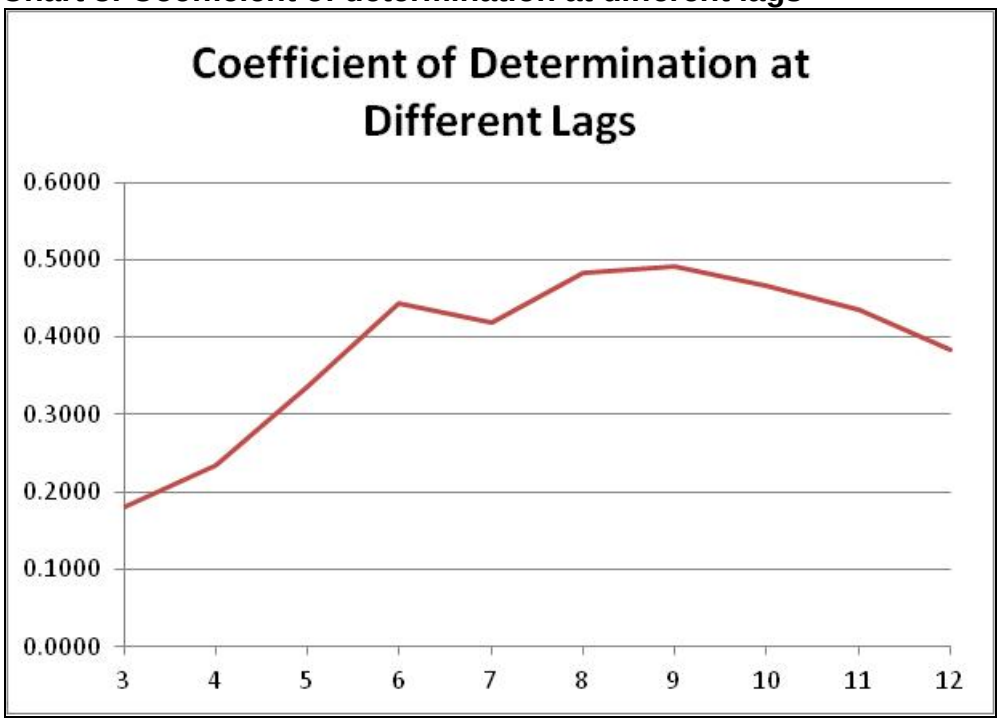
3.30 To identify the lags between credit-to-GDP gap and annual growth in GNPA, a regression corrected for first order auto-correlated errors was run for various lags. It was observed that the regression with lag of nine quarters provides the best fit as could be observed from the table-2 and chart-3 below.

Table-2: Results of regression between credit-to-GDP gap and growth in GNPA

Lag (k)	Constant	Coeff of Credit GDP Gap(-k)	R-Bar Square
3	0.53	0.58	0.1802
	2.97	0.18	
4	5.05	0.66	0.2339
	2.93	3.76	
5	4.51	0.79	0.3360
	2.75	4.72	
6	3.99	0.90	0.4431
	2.59	5.80	
7	3.66	0.89	0.4196
	2.27	5.47	
8	3.22	0.95	0.4839
	2.06	6.13	
9	3.32	0.96	0.4908
	2.09	6.13	
10	3.28	0.94	0.4664
	1.96	5.77	
11	3.52	0.91	0.4359
	2.00	5.37	
12	3.91	0.85	0.3825
	2.08	4.76	

(Value in each row, below the constant and the coefficient of credit-to-GDP is their t-statistic. It is at 5 per cent significance).

Chart 3: Coefficient of determination at different lags



3.31 The resultant regression equation is as under.

Annual GNPA growth =	***3.32+***	***0.96 CREDIT-TO-GDP GAP(T-9)***
	(2.09*)	***(6.13*)***

The figures in bracket are the t-values

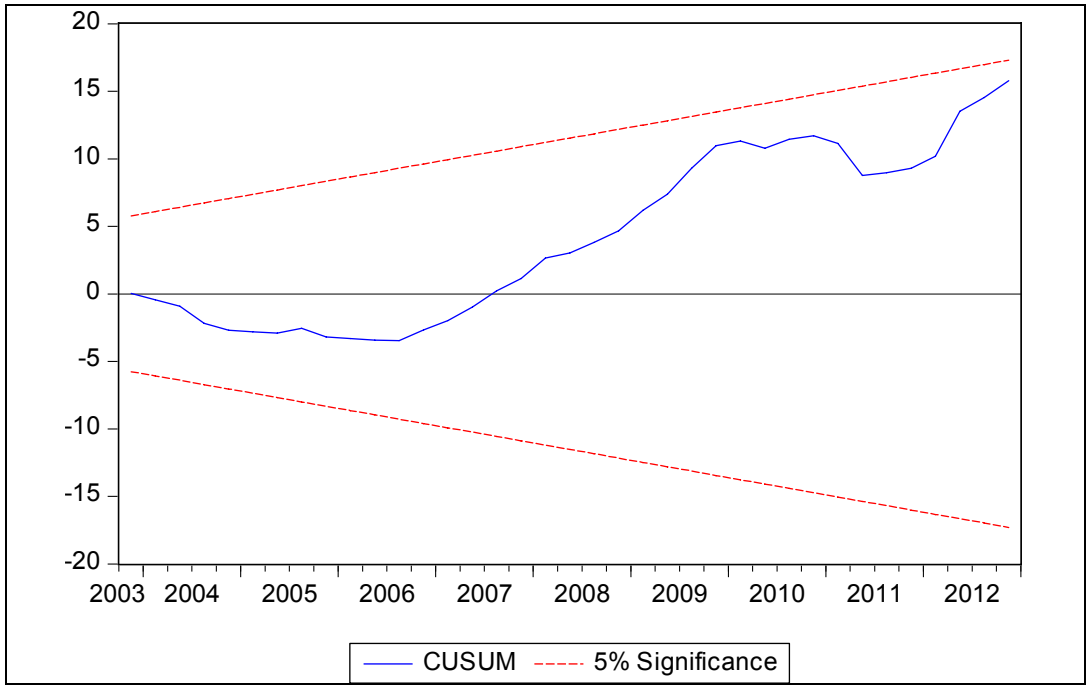
** Statistically significant at 5 per cent*

The estimates in the regression equation imply that a single percentage point increase in credit-to-GDP gap results in an increase of 0.96 percentage point in GNPA growth. The value of the constant at 3.32 (percentage points) indicates that, on average, this portion of the annual average GNPA growth remains to be explained by other factors which may not be related to the variation in credit-to-GDP gap. According to the estimated equation, the credit-to-GDP gap leads GNPA growth statistically significantly by sufficient period with a peak statistical significant period of nine quarters. Hence, given the lag identified by the analysis, the CCCB should be triggered much before the expected onset of GNPA deterioration.

3.32 Chart-12 shows the CUSUM[14] (Cumulative Sum) plot test for the equation reported above implying that the relationship was by and large stable.

[14] The popular CUSUM testing was suggested by Brown, Durbin and Evans (1975) to test the stability of the coefficients of an estimated regression equation. It is based on the cumulative sum of the recursive residuals from

Chart-4: CUSUM test



3.33 The Basel Committee has suggested that any increases in the CCCB need to be preannounced by up to 12 months to give banks time to meet the additional capital requirements before they take effect. Hence, to give banks a reasonable amount of time to adjust their capital plans, the IWG recommends that the CCCB decision be preannounced with a lead time of up to 12 months (4 quarters) as prescribed by the Basel Committee.

Threshold estimation for CCCB decision – Sarel methodology

3.34 Identification of the CCCB trigger can be based on charting evidence on the stability of the relationship between the credit-to-GDP gap and GNPA growth. However, for a more formal analysis to estimate the CCCB trigger threshold, the IWG used the popular methodology suggested by Sarel (1996)[15]. This method uses a single regression with iteration over different threshold cut-offs for the range of values observed for the explanatory variable in the sample. The threshold is then determined both on the basis of the explanatory power of the equation and the evolving significance of the coefficient in question. The results obtained from this methodology are presented in Table-3 below.

---

the regression. The test finds parameter instability if the cumulative sum goes outside the area between two critical straight lines drawn to indicate 95% confidence level. In this case the cumulative sum stays within the critical straight lines implying desired confidence level of the regression coefficients.

[15] Sarel, 1996

Table-3: Threshold Estimation for activating CCCB *a' la* Sarel

Threshold value chosen (percentage points)	Significance (t –value) for data values below the threshold	Significance (t-value) for data values above the threshold	RBAR SQUARE
0	2.60*	2.89	0.464
1	2.56*	2.96	0.463
2	2.42*	3.27	0.461
3	2.89**	3.13	0.465@
4	2.84**	3.13	0.465
5	2.98**	3.24	0.465
6	2.98**	3.24	0.465

@ Maximum R-Bar Square
** Significant at 5 percent level of significance*
*** Significant at 1 percent level of significance*

3.35 Estimates in Table-3 above suggest that the CCCB trigger should be activated as soon as the credit-to-GDP gap reaches 3 percentage points. This is because for coefficient of credit-to-GDP gap for values above the threshold, coefficient of determination becomes maximum at that level and remains high for further values of the threshold. Incidentally, this estimated level of the trigger is close to that suggested by the Basel Committee at 2 percentage points. Hence, the IWG decided to recommend setting of the lower threshold (L) at 3 percentage points.

3.36 As regards the upper threshold (H) when the CCCB reaches its maximum, the IWG noted that in the guidance provided by the Basel Committee, there is a difference of 8 percentage points between upper threshold (10 percentage points of credit-to-GDP gap) and lower threshold (2 percentage points of credit-to-GDP gap). However, the IWG felt that in India, growth related concerns would at times require rapid credit expansion. Further, India being an emerging market economy, our macro-economic conditions and growth related requirements cannot be compared with other countries, especially developed countries, and hence, the upper threshold of 10 percentage points of credit-to-GDP gap may be on the lower side and may not be suitable in Indian context.

3.37 Empirical evidence in the past decade shows that the credit-to-GDP gap has exceeded 20 percentage points only in one quarter, and even came close to that level only during two earlier quarters. Further it was observed that credit-to-GDP gap has immediately fallen sharply after each peak, due to a combination of several factors,

including the policy response. The average credit-to-GDP gap during a run of positive values from September 2005 to September 2009 worked out to 11.56 percentage points. Out of these 17 quarters, the value has remained close to the average in the band of 8-12. The credit GDP gap exceeded the 15 percent mark only on four occasions. Moreover, the Basel Committee has observed that upper threshold should be low enough, so that the buffer would be at its maximum prior to major banking crises. Considering these factors, the IWG felt that a threshold value of 15 percentage points may be identified to deploy the maximum value of CCCB, in view of the rarity with which this threshold has been breached in the recent history.

3.38 Hence, as far as credit-to-GDP gap guidance of Basel Committee is concerned, the CCCB may phase-in once the credit-to-GDP gap reaches 3 percentage points, provided its relationship with GNPA growth remains significant. In such a case, the CCCB shall linearly increase in value till it reaches 2.5 per cent of the risk weighted assets corresponding to 15 percentage points of credit-to-GDP gap, after which, the CCCB will remain constant. Of course, the final decision on CCCB will be made based on performance of other indicators also, as discussed in Chapter 4.

CHAPTER 4

Supplementary Indicators

4.1 The Basel Committee guidance on the issue of CCCB, as also a number of other research papers on the subject clearly recognized that the credit-to-GDP gap may not be the only guide to make decisions on activation and release of the CCCB. Moreover, statistical measures, such as the one based on credit-to-GDP ratio, may not always be capable of capturing the cycles immediately. There are several other indicators suggested in the literature to indicate the build-up of system-wide risk. In view of this, the IWG felt that it may be desirable that additional information may also be used for CCCB decision,.

4.2 As discussed in Chapter 2 of this Report, the BCBS guidance note suggests a few variables which may be useful indicators in the build-up and release phases of CCCB. The IWG considered the indicators suggested by the Basel Committee as also their variants in the Indian context as possible supplementary indicators. In addition, other information collected by the RBI as part of monetary policy, banking supervision and for supporting other internal functions was also considered as possible supplementary indicators. While reviewing the utility of the indicators, the IWG followed the approach of taking into account the empirical observations from the Indian economy and the literature from official as well as academic sources.

4.3 The list of indicators initially considered as additional indicators is as follows:

- Asset Prices – Housing Price Index
- Asset Prices – Equity
- Asset Prices – Gold
- Credit - Deposit ratio
- Corporate sector's ability to meet its debt obligations
- Industrial outlook survey – conducted by the Reserve Bank of India
- Credit condition survey – conducted by the Reserve Bank of India

Asset Prices

4.4 Among the other asset prices, property prices are considered to be relatively more useful predictors of banking crises. In India, the property price index is a relatively new concept. The quarterly House Price Index (HPI) for various centres is based on the official data on registration of property sale/purchase deed collected from the

Department of Registration and Stamps (DRS) of various State governments. HPI for nine centres viz., Mumbai, Delhi, Bengaluru, Ahmedabad, Lucknow, Kolkata, Jaipur, Kanpur and Chennai are compiled presently by the RBI. Observations are stratified in three size-categories (small, medium and large houses) as also different locations. The weighted average price based on median is used to develop the index. Weights are estimated using the proportion of transactions in the base period.

4.5 Another property price indicator is the RESIDEX index of National Housing Bank (NHB), launched on July 10, 2007. Presently the residential housing sector is the only constituent of the index, though it is envisaged that the index may be expanded at a later date to include commercial property and land also. As the number of data points available in the index is not much, and also as the index is in formative stage, it was not considered as one of the supplementary indicators. However, going forward, this index may form a part of supplementary indicators for CCCB decision.

4.6 The IWG, therefore, recommends that going forward, indices like quarterly House Price Index (HPI) published by RBI and RESIDEX published by National Housing Bank may be used, provided the time series are long enough to facilitate such analysis.

4.7 Equity is another important asset class, and the equity market is one of the most liquid markets in India. However, in the context of equity prices, research is divided on the suitability of using equity market data for meaningful inferences. Borio and Lehmann (2009) refer to what is called “paradox of financial instability”, implying that the system gives all the signals of stability, when it is at the most vulnerable stage. Risk premia, volatility and leverage etc., are low and the prices are strong. With such behaviour, these indicators provide “a false sense of security” to the policymakers (Borio, 2011). However, equity prices are considered to be a leading indicator, as stock prices represent to some extent, the expectation of investors on the performance of a company. This indicator was, therefore, assessed as part of an array of supplementary indicators to reinforce the CCCB decision.

Table-4: Correlation of NSE 500 Stock Returns With GNPA Growth and Credit – GDP Gap

Lead / Lag (i)	CNX500_R,GNPA_GR(+i)	CNX500_R,CRGDP_G1(+i)
0	-0.3986	-0.1246
1	-0.5021	-0.0283
2	-0.5372	0.0490
3	-0.4746	0.1561
4	-0.3545	0.2271
5	-0.2484	0.2510
6	-0.1642	0.2929
7	-0.1229	0.3223
8	-0.0949	0.3706

4.8 Table-4 enumerates the correlation of NSE 500 stock returns with the two main variables considered for buffer decisions, viz., GNPA growth and credit-to-GDP gap. The analysis shows that expectedly, the correlation between stock returns and GNPA growth is negative statistically significant. But the correlation of stock returns with credit-to-GDP gap is insignificant and does not show any indication of significant correlation with reasonable lead/lag. Therefore, its utility as a supplementary indicator appears rather limited.

4.9 Gold is one of the important asset classes that are considered to be a “safe haven”, particularly during periods of crises or stress. This particular behavior of the investors towards gold makes it an important indicator to assess build-up of systemic risk. According to Mishra and Mohan (2012), financial instability implications of gold prices to the Indian financial system depend on: (a) whether gold is in a state of bubble or not and (b) the nature and significance of gold in the overall financial architecture. Gold, unlike a financial asset, is not associated with cash inflows. This makes it somewhat difficult to judge on a historical basis whether it is in a state of bubble or not and thus to predict the nature of correction in gold prices in the immediate future. Theoretically, the severity of the impact a correction in any asset price (including gold) would have on the financial system would depend upon the nature of the ownership of the asset. Specifically, if those assets are held by banks and financial institutions, (collectively financial intermediaries), either directly or indirectly through collateral, the severity of impact of a bursting of a bubble would be severe. However, gold was not considered as a significant indicator in this analysis.

Credit – Deposit Ratio

4.10 The credit-deposit ratio has been an integral part of micro-prudential monitoring in India. While the absolute C-D ratio is a function of several factors, including the statutory requirements, such as CRR and SLR, incremental C-D ratio provides an insight into the possible over-heating of the credit market and use of alternate sources of funding by the banks. These alternative sources of funding may be of high cost as well as less stable, thereby increasing the roll-over risk in the periods of crisis. Further credit extended out of such sources may not provide adequate spread, on margin, to cover the incremental risk of such loans.

4.11 However, use of incremental C-D ratio with quarterly increments provides a volatile series, and does not provide a complete view about emerging riskiness of the funding side on the balance sheets of the banks. Therefore, a suitable combination of absolute and incremental C-D ratio may provide a better view of leverage of banks. Choudhary and Gopinath (2012) have analysed this aspect and found that the composite C-D ratio provides an alternate CCCB guide.

4.12 Examining the conventional indicators of C-D ratio reveals that the quarterly incremental C-D ratio is quite volatile and has high degree of noise which renders it ineffective in tracking the incipient risks in the financial system. On the other hand, the cumulative C-D ratio does not adequately capture the recent changes in credit growth and the manner in which credit growth has been funded.

Table-5: Correlation of Incremental C-D Ratio with GNPA Growth and Credit-to-GDP Gap

Lead / Lag (i)	Incremental C-D Ratio (moving period 3 years) and GNPA(+i)	Credit-to-GDP gap and Incremental C-D Ratio (moving period 3 years) (-i)
0	-0.2751	0.3417
1	-0.1437	0.4609
2	-0.0553	0.5328
3	0.0595	0.5987
4	0.1905	0.6370
5	0.2976	0.6325
6	0.3846	0.5947
7	0.4619	0.5885
8	0.5644	0.5878

4.13 Incremental C-D ratio for moving period (one year to three years) was analysed. It can be observed from Table-5 that the incremental C-D Ratio has negative contemporaneous correlation with GNPA growth. However, increase in incremental C-D ratio for moving period of three years leads to GNPA growth by about 8 quarters.

4.14 Increase in the incremental C-D ratio also moves along with increase in credit-to-GDP gap and also causes the gap to increase in about 4-5 quarters as indicated by statistically significant correlation coefficients. Therefore, this indicator provides an early warning signal before the signs of weakness show up in the primary indicators, viz., credit-to-GDP gap and GNPA.

4.15 The IWG decided to recommend use of incremental C-D ratio for moving period of three years, as also, its correlation with credit-to-GDP gap and GNPA growth as an additional indicator to facilitate CCCB decision.

Industrial Outlook Survey

4.16 Industrial Outlook (IO) Survey is an opinion based forward looking survey covering select public and private limited companies in the manufacturing sector and is being conducted on a quarterly basis by the RBI. The survey collects qualitative response (increase/decrease/no change) on 20 major parameters for two quarters.

4.17 The objective of the Survey is to get the performance and business assessment/prospect of the Indian manufacturing companies with regard to economic and industrial environment. The IO Survey captures the comprehensive assessment of the business environment in terms of growth opportunities as well as risks and uncertainties.

4.18 Currently, the sample covers about 2000 public and private limited companies in the manufacturing sector. The small companies (with paid up capital below ₹ 50 lakh) are not included in the sample.

4.19 The survey schedule is short and contains five blocks with simple qualitative questions. It seeks the assessment on the current business situation from manufacturing companies and their outlook for the next quarter through a set of

structured questions covering different performance parameters. An additional block (Block 6) on investment intentions is annually canvassed in the April-June quarter for the purpose of getting an assessment of the investment intention of the manufacturing companies and their outlook for the next year. The answers to the majority of the questions are measured on a 3-point scale (e.g. increase, decrease and no change). Table-6 below shows the plot of assessment and expectations index computed using the Industrial Outlook Survey.

Table-6: Correlation of Industrial Outlook Survey Assessment Index with GNPA Growth and Credit-to-GDP Gap

Lead / Lag (i)	IO Survey INDEX and GNPA (-i)	IO Survey INDEX and credit-to-GDP gap (+i)
0	-0.5628	-0.0146
1	-0.4647	0.0570
2	-0.4035	0.0993
3	-0.2956	0.2132
4	-0.2836	0.2987
5	-0.2325	0.3011
6	-0.1864	0.2865
7	-0.2152	0.3316
8	-0.1840	0.4663

4.20 Empirical evaluation of the assessment index computed from the IO Survey indicates that the index shows a significant negative correlation with the GNPA growth, implying higher GNPA growth if the index is low and *vice versa*. Further, there is no contemporaneous correlation between IO Survey Assessment index and credit-to-GDP gap though there is some correlation between them with a lag of over a year. So, higher IO Survey assessment index is an indicator of both the factors that lead to high credit growth, viz., periods of improvement in GNPA situation and probable relaxation of credit standards. However, the IWG decided to recommend that IO Survey assessment index along with GNPA growth may be used as a supplementary indicator to facilitate CCCB decision.

Corporate Sector ability to meet debt obligations

4.21 One way of looking at the corporate sector's ability to repay its debt and interest is to look at the NPA data from the banks. But the other, and more direct, way of measuring the same is to look at the financial statements of the corporate sector. As part of improving corporate sector disclosures and transparency brought about in the wake of financial liberalization and increased globalization, the corporate sector, at least

the segment listed on stock exchanges, publish their financial results (abridged and un-audited) at quarterly frequency. These provide a valuable source of information, when tracked on a consistent basis.

4.22 For the purpose of various analytical requirements, and to get better understanding of the economic performance, the RBI has been tracking this data source for past several years. Consistent time series of the ratios and rates is available since the financial year 2000-01.

4.23 The main indicators available at quarterly frequency are the sales, expenditure, raw material cost, staff cost, change in stock, operating income, interest payments, tax provisions, depreciation and profit before and after tax. A reasonable sample of about 2000 companies is regularly analysed based on these variables and their growth rates and ratios. Of the various indicators, the profitability margin and the interest burden are of particular importance to assess the stress (or otherwise) faced by the corporate sector. As the sample is sufficiently large and covers most of the industry segments, these trends can be taken as representative indicators.

4.24 It is recognized that while interest burden will indicate the rising / falling interest rate regime as per the monetary policy at a particular point in time, it also points at the pressure on margins from other sources, which squeeze / ease the financial position of the corporate sector.

Table-7: Correlation of Interest Coverage Ratio with GNPA Growth and Credit-to-GDP Gap

Lead / Lag (i)	Credit-to-GDP gap and interest coverage ratio (-i)	GNPA growth and interest coverage ratio (-i)
0	0.6140	-0.0365
1	0.6691	0.1097
2	0.6233	0.2783
3	0.6087	0.4253
4	0.5799	0.5525
5	0.5449	0.6343
6	0.4877	0.7499
7	0.4065	0.7994
8	0.3352	0.7952

4.25 On examining the relationship of the interest coverage ratio to GNPA growth, it is found that there is no contemporaneous correlation between these indicators.

4.26 However, when the correlation between interest coverage ratio and credit-to-GDP gap is examined, it is seen that in the periods of high credit-to-GDP gap, the companies are also having comfortable interest coverage, thereby indicating healthy financial position. Looking at the significant correlation of interest coverage ratio with credit-to-GDP gap, the IWG recommends its inclusion as one of the supplementary indicators to supplement the counter cyclical buffer decision.

Credit Condition Survey

4.27 Credit Condition Survey (CCS) is a survey of qualitative information on major factors affecting credit, which are especially important in the context of expansion as well as contraction in specific sectors of the economy. The survey is aimed at enhancing the analysis of credit conditions by the RBI. In a scenario, when it is relatively easy to monitor the credit supply by the banks, but no direct quantitative data is available on credit demand, this type of survey becomes useful. This is a forward-looking survey and seeks information on various aspects of credit, including developments in credit sector and causes thereof. Banks may also find the aggregate results useful for their own analysis. The RBI has been conducting this survey on a quarterly basis since January-March 2010, in the months of March, June, September and December. One survey quarter is referred as one survey round. As this survey is relatively recent with only two years' quarterly data, it may not be possible to use the results of CCS immediately. However, this may be a very useful indicator, going forward.

4.28 The IWG recommends that going forward, the CCS data may be used for CCCB decision, provided the time series are long enough to facilitate such analysis.

Use of Sectoral Approach

4.29 Due to lack of availability of a long time series of a credible real estate index, the IWG could not use this critical indicator in the present exercise for CCCB implementation, but has recommended it as a forward looking indicator. The IWG observed that looking at the level of development of market infrastructure in our country, as also due to lack of availability of long time series of data, there may be

some sectors (like the real estate sector) that may be critical due to their bearing on financial stability, but may not be a part of CCCB decision. Credit growth to certain sensitive sectors may lead to formation of asset bubbles and also significantly outpace the overall credit growth. Excessive credit growth in specific sectors may have significant financial stability risks.

4.30 The RBI has been applying countercyclical capital and provisioning requirements based on the analysis of sectoral credit growths. In the build-up phase, the tightening of prudential requirements made credit to targeted sectors costlier thereby moderating the flow of credit to these sectors. There is evidence that moderation in credit flow to these sectors was due in part to banks becoming cautious in lending to these sectors on the signalling effect of RBI's perception of build up of sectoral risks. This way the exposure of banks to these sectors was reduced. Looking at such sector specific peculiarities in our country and their subsequent impact on implementation of macro-prudential policies, the IWG recommend that the CCCB framework in India may have to work in conjunction with sectoral approaches.

IWG view on choice of indicator(s)

4.31 The Basel Committee has prescribed credit-to-GDP ratio and credit-to-GDP gap as a guide and a useful common reference point in deciding CCCB framework. However, they have admitted that this guide does not always work well in all jurisdictions at all times and have cautioned against using this guide mechanically. Judgment coupled with proper communications is thus an integral part of the CCCB regime. The CCCB guide should also be internationally consistent.

4.32 The IWG noted the guidance of the Basel Committee, and in its analysis, has endeavoured to enunciate principles that would work in conjunction with judgement so as to establish a sound framework of CCCB in India, as also, to facilitate further decision-making in the setting of CCCB.

4.33 To that end, the IWG took a stock of available indicators that are relevant to our banking system. The IWG was of the view that the demands of the Indian economy and the dynamics in our domestic financial markets are different from that of other countries. Hence, instead of depending solely on one indicator, the decision on CCCB should be taken considering the dynamics of various supplementary indicators. Further, the

analysis should also include the correlations that these supplementary indicators have with the GNPA growth. In the analysis, it is observed that supplementary indicators such as incremental C-D ratio and IO Survey Assessment index have a significant relationship with the GNPA growth. Similarly, interest coverage ratio has a significant relationship with the credit-to-GDP gap. Further, the lag at which these relationships get significant is more than 4 quarters (i.e. 12 months), which the IWG recommends as the period for pre-announcement of imposition of the CCCB.

4.34 The analysis of all the indicators on an ongoing basis will provide sufficient information inputs to the RBI to decide whether it is necessary to activate the CCCB. As the empirical evidence on the basis of any single indicator may not be conclusive, the IWG recommends that decision making in respect of CCCB may be similar to the multiple indicator approach followed in policy making. In any case, the Basel Committee has provided ample freedom to the national authorities to "...apply judgment in the setting of the buffer in their jurisdiction after using the best information available to gauge the build-up of system-wide risk." Hence, the IWG felt that the RBI may apply discretion in terms of use of indicators while activating or adjusting the buffer.

CHAPTER 5

Countercyclical Capital Buffer Release Phase

5.1 Under certain circumstances, it may be necessary to release the CCCB accumulated by the banks. This release may be warranted where there are losses in the banking system that pose a risk to financial stability or when there are systemic issues. In the case of the former, immediate release of CCCB would be desirable so that it is used for absorbing the losses before the banks begin depleting their normal capital conservation buffers. Further, in case when problems elsewhere in the financial system cause disruption to the flow of credit, thereby impacting the growth adversely, the release of CCCB should be immediate to stem the crisis from impacting the banking system and resultant losses. In other words, the variables guiding the release phase should react sufficiently promptly.

5.2 The Basel Committee observes that macro variables may not be ideal indicator variables for signalling the release phase. Its document states that "*…While credit and GDP often contract around crises, this is not always the case as was experienced in various countries (Germany, Switzerland, the United Kingdom and the United States) during recent global financial crisis where real GDP continued to grow for over a year after the crisis materialized. Indicators of credit conditions may, on the other hand, provide useful information to identify bad times. But they are survey based and therefore potentially vulnerable to manipulation*".

5.3 Indicators of banking sector conditions such as aggregate profits, non-performing loans, etc., provide mixed signals for the release phase. Though asset prices are useful indicators as their frequency of availability is higher than quarterly macro data or information from bank balance sheets (which may only be available annually in some cases), these may actually result in releasing the CCCB too early. However, these are useful in explaining the need to release the CCCB after the financial system comes under stress.

5.4 Spreads such as CDS spreads, funding cost, etc., can emerge as alternative market based indicators especially as they were able to capture the onset of the recent crisis. However, in India we do not have a CDS series available and the corporate credit

spreads data series may also not be representative due to a not so active corporate bond market. In any case, corporate credit spreads may not be considered as a useful indicator as their correlation with systemic banking crises is yet to be established. The historical evidence for the TED spreads is also ambiguous. Moreover, as empirical evidence is not there for other crises, the case for using these variables in a prescriptive fashion is not robust enough.

5.5 The IWG noted that as the CCCB approach is evolving and countries are trying different indicators that suit their domestic conditions, there is an element of inexperience in terms of implementation of CCCB decision, especially when it comes to release phase. The same has also been articulated in the guidance document of the Basel committee. A myriad of indicators have been discussed in the preceding chapters that can be used during the activating phase of the CCCB. For the release phase, the same set of indicators may be used. However, owing to inherent uncertainty and the lack of experience associated with operating of CCCB, the IWG felt that instead of hard rules-based approach, flexibility in terms of use of judgement and discretion may be provided to the RBI for operating the release phase of CCCB.

5.6 Further, as far as release of CCCB is concerned, following three options were available to the IWG.

a. Release the CCCB gradually over a period of time.
b. Release the CCCB in discrete intervals and/or amounts.
c. Promptly release the CCCB in a single point in time.

5.7 The IWG observed that gradual release of CCCB or even its release in discrete time/amount may not serve the basic purpose of having a CCCB in place. The IWG felt that in case of crisis in banking sector or any other sector indirectly impacting the banking sector, it is prudent to stem the crisis early. Hence, releasing the complete CCCB at a single point in time may provide the required buttress to the banking system and hence, may stem the resultant losses therein. The IWG recommends that the release of CCCB should be prompt and in a timely fashion and that the RBI may use judgement and discretion instead of hard rules-based approach, so as to have flexibility during the release phase.

CHAPTER 6

Other issues

Treatment of surplus when CCCB returns to zero

6.1 The Basel Committee has observed that when the CCCB returns to zero, the capital that is released may be used by the banks to absorb losses or to protect themselves against the impact of problems elsewhere in the financial system. In such a case, the capital surplus created should be unfettered and there should be no restrictions on distribution of this capital. However, they have left the final decision in the hands of national authorities. The IWG noted the importance of capital in our system and felt that unfettered access to capital by banks may not be prudent. Hence, the IWG recommends that the RBI would provide necessary guidance to the banks on the treatment of surplus when the CCCB returns to zero.

Jurisdictional reciprocity

6.2 The Basel Committee has recommended jurisdictional reciprocity so as to ensure level playing field between domestic banks and foreign incorporated banks. The host jurisdiction may prescribe CCCB requirement for the exposures of all the banks in its jurisdiction. However, the home jurisdiction may impose higher CCCB requirement for the banks they supervise, in case they feel that the same is inadequate. Moreover, should the home supervisor stipulate lower CCCB requirement in the host jurisdiction (lower than that prescribed by the host jurisdiction), it may distort the level playing field between the domestic and foreign banks in host jurisdictions and also, it may discourage implementation of CCCB.

6.3 The IWG felt that jurisdictional reciprocity is important as it would provide level playing field for all the banks in India and hence, both the domestic banks and the foreign incorporated banks will be required to maintain CCCB based on their exposure in India. IWG recommends that all the banks operating in India (either foreign incorporated or domestic banks) should maintain capital under CCCB framework based on exposures in India. The RBI may convey the CCCB requirement to the home supervisor of the foreign incorporated banks so that they may ensure that their banks maintain adequate capital under CCCB as prescribed by the RBI. IWG also felt that the banks incorporated in India having international presence may maintain adequate capital under CCCB as prescribed and communicated by the respective host

supervisors to the RBI. The RBI may also ask Indian banks to keep excess capital under CCCB framework in any of the host countries they are operating if it feels the CCCB requirement in the host country is not adequate. In case the CCCB requirement in other jurisdiction is nil / insufficient, the RBI may require that the banks maintain higher buffers.

Communication of CCCB decision

6.4 The Basel Committee has noted that the buffer in each jurisdiction is likely to be used infrequently, and hence, instead of making quarterly statements on CCCB decision on an on-going basis, the authorities may comment on at least an annual basis. Hence, the IWG recommends that in India, CCCB decisions may form a part of the annual monetary policy statement of the RBI. However, more frequent communications can be issued by the RBI, if there are sudden and significant changes in economic condition that may warrant CCCB decision.

6.5 The IWG also recommends that at the time of communicating CCCB decision, the RBI may disclose, at its discretion, the mechanics of the CCCB approach, the information that was used to arrive at the decision, the time line of the CCCB activation, etc.

Interaction with Pillar 1 and Pillar 2

6.6 The IWG felt that the CCCB incorporates elements of both Pillar 1 and Pillar 2. The IWG also noted that it would not be desirable for a bank maintaining CCCB to hold capital under Pillar 2 requirement for financial system-wide issues. Further, the IWG recommends that the capital meeting the CCCB should not be permitted to be simultaneously used to meet non-system-wide elements (e.g. concentration risk) of any Pillar 2 requirement.

Location of the CCCB

6.7 The IWG noted that as in the case with the minimum capital requirement, host authorities would have the right to demand that the CCCB be held at the individual legal entity level or consolidated level within their jurisdiction. The IWG recommends that for all banks operating in India, CCCB shall be maintained at solo basis as well as at consolidated basis in India.

Periodic Review

6.8 The IWG recognizes that CCCB is a new concept and is untested. Further, it is not likely that the CCCB would be imposed frequently. The indicators and thresholds used by the IWG may either show more robust results in due course of time or may even breakdown. Also, there is always a possibility of emergence of new indicators. Therefore, continuous research and empirical testing may be required and the indicators suggested in recommendation 9 such as House Price Index, RESIDEX, Credit Condition Survey, etc., should be further explored.

Annex I

Step-by-step guidance of an illustrative calculation methodology for countercyclical capital buffer imposition as mentioned in December 2010 BIS paper 'Guidance for national authorities operating the countercyclical capital buffer'

Calculation for CCCB may be carried out by the national authorities as indicated in the following steps. Those are:

Step 1: Calculation of the credit-to-GDP ratio

Step 2: Calculation of the credit-to-GDP gap (the gap between the ratio and its trend)

Step 3: Using credit-to-GDP gap to determine CCCB add-on

Each of the above steps is described in detail below with an illustrative example at the end

Step 1: calculation of the credit -to-GDP ratio

The credit-to-GDP ratio at any period t for a country is calculated as:

$$RATIO_t = CREDIT_t / GDP_t \text{ X } 100\%$$

GDP_t is domestic GDP (after de-seasonalising with methods like X-12 ARIMA) and $CREDIT_t$ is a broad measure (as inclusive as possible, more components of credit may be added in the study as more and more data become available to the national authorities) of credit to the private, non-financial sector in period t. Both GDP and CREDIT are in nominal terms and on a quarterly frequency.

Step 2: calculation of the credit-to-GDP gap

The credit-to-GDP ratio is compared to its long term trend. If the credit-to-GDP ratio is significantly above its long term trend (i.e. there is a large positive gap) then possibility is there that credit may have grown to excessive levels relative to GDP. National authorities need to ascertain that this growth in the ratio is indeed because of increase in credit (likely to be unsustainable) in comparison to its GDP.

The gap (GAP) in period t for each country is calculated as the actual credit-to-GDP ratio at time t minus its long-term trend (TREND till period t):

$$GAP_t = RATIO_t - TREND_t.$$

TREND is a simple way of approximating something that can be seen as a sustainable average of ratio of credit-to-GDP based on the historical experience of the given economy. While a simple moving average or a linear time trend could be used to establish the trend, Hodrick-Prescott filter has been used by BIS in this regime as it has the advantage of giving higher weights to more recent observations. This is useful as such a feature is likely to be able to deal more effectively with structural breaks (very useful for emerging economies). The Hodrick-Prescott (HP) filter is a standard mathematical tool used in macroeconomics to establish the trend of a variable over time. For the purposes of this regime a one sided Hodrick-Prescott filter[16] with a high

[16] In India, two-sided filter has been used in the analysis.

smoothing parameter (lambda) set to 400,000, has been suggested by BIS to establish the trend ($TREND_t$).

Step 3: Using the credit-to-GDP gap to determine CCCB add-on

The size of the CCCB add-on at any period t (VB_t) (in percent of risk-weighted assets) is zero when GAP_t is below a certain threshold (L). It then increases with the GAP_t until the CCCB reaches its maximum level (VB_{max}) when the GAP exceeds an upper threshold H.

The lower and upper thresholds L and H are keys in determining the timing and the speed of the adjustment of the CCCB guide. BCBS analysis has found that an adjustment factor based on L=2 and H=10[17] provides a reasonable and robust specification based on historical banking crises in a cross section of countries (both developed and emerging economies) across time. However, this depends to some extent on the choice of the smoothing parameter (lambda), the length of the relevant credit and GDP data, and the exact setting of L and H.

Setting L=2 will imply that when:

$((CREDIT_t / GDP_t) \times 100\%) - (TREND) < 2\%$, the CCCB add-on is zero

Setting H=10 will imply that when:

$((CREDIT_t / GDP_t) \times 100\%) - (TREND_t) > 10\%$, the CCCB add-on is at its maximum

BIS has suggested the maximum CCCB add-on (VB_{max}) to be 2.5 per cent of risk weighted assets. As mentioned in step 3, if the credit-to-GDP ratio ($CREDIT_t/GDP_t$) at any period t is 2 percentage points or less above its long term trend ($TREND_t$), the CCCB add-on (VB_t) will be 0. On the other extreme, i.e., when the credit-to-GDP ratio ($CREDIT_t/GDP_t$) at any period t exceeds its long term trend ($TREND_t$) by 10 percentage points or more, the CCCB add-on will be 2.5 per cent of risk weighted assets. When the credit-to-GDP ratio is between 2 and 10 percentage points of its trend, the CCCB add-on will vary linearly between 0 and 2.5 per cent. This will imply, for example, a CCCB of 1.25 per cent when the credit-to-GDP gap is 6 (i.e. half way between 2 and 10).

Calibration of thresholds at which the guide indicates a CCCB requirement may be appropriate

Some previous academic work has shown that the credit-to-GDP gap can be a powerful predictor for banking crises. Building on the general principle that the objective of the CCCB is to protect banks from periods of excess credit growth, the BCBS set out criteria to determine threshold GAP level L, when the rule should start building up capital buffers, and a GAP level H, at which the maximum CCCB should be reached. Given the current state of knowledge, the rule simply provides a starting guide to the relevant authorities responsible for deciding the CCCB add-on. These authorities retain the right to implement a different CCCB add-on than indicated by this simple guide, subject to providing a public and transparent explanation of this decision.

[17] In Indian context the corresponding values of L and H are 3 and 15, respectively.

Criteria for the minimum threshold (L) when the guide would start to indicate a need to build up capital

1. *L* should be low enough, so that banks are able to build up capital in a gradual fashion before a potential crisis. As banks are given one year to raise additional capital, this means that the indicator should breach the minimum at least 2-3 years prior to a crisis.
2. *L* should be high enough, so that no additional capital is required during normal times.

Criteria for the maximum (H) at which point no additional capital would be required, even if the gap would continue to increase

3. *H* should be low enough, so that the CCCB would be at its maximum prior to major banking crises (such as the current episode in the US or the Japanese crises in the 90s).

.

Annex II

Calculating bank specific buffers - calculation methodology

1. This annex provides guidance to the banks which are having private sector exposures to institutions based in countries other than India. This will help in achieving jurisdictional reciprocity from India's side.

2. Let us take an example and assume that the published CCCB add-ons in the India, USA, Netherlands and Japan are 2%, 1%, 1.5% and 1% of risk weighted assets, respectively. This means that any loans to USA counterparties will attract a CCCB requirement of 1% in respect of these loans. Similarly loans to Dutch and Japanese counterparties will attract CCCB requirements of 1.5% and 1%, respectively. As a consequence, a bank with 80% of its credit exposures to Indian counterparties, 10% to USA counterparties, 5% of its credit exposures to Dutch counterparties and 5% of its credit exposures to Japanese counterparties would be subject to an overall CCCB add-on equal to 1.825% of risk weighted assets:

CCCB = (0.80*.02+0.10*.01+.05*.015+.05*.01) = 1.825%

3. Banks need to keep in mind that in cases where RBI feels that the CCCB add on by host jurisdiction is not reflecting the true risk of the exposures to that jurisdiction, RBI may always prescribe a higher CCCB requirement for banks' exposure in that jurisdiction.

Abbreviations

ADR	Asian Depository Receipts
AIFI	All-India Financial Institutions
BoE	Bank of England
BoJ	Bank of Japan
BCBS	Basel Committee on Banking Supervision
BIS	Bank for International Settlement
CRR	Cash Reserve Ratio
CCS	Credit Condition Survey
CD Ratio	Credit-Deposit ratio
CUSUM	Cumulative Sum of Squares
DRS	Department of Registration and Stamps
DW	Dublin Watson statistic
ECB	European Central Bank
EXIM bank	Export Import Bank of India
FCCB	Foreign Currency Convertible Bonds
GDR	Global Depository Receipts
GDP	Gross Domestic Product
GNPA	Gross Non Performing Asset
HFC	Housing Finance Companies
HP Filter	Hodrick-Prescott filter
HPI	House Price Index
IWG	Internal Working Group
IMF	International Monetary Fund
LIC	Life Insurance Corporation
LIBOR	London Inter-bank Offer Rate
LTV	Loan-to-Value
MVTF	Macro Variables Task Force
NABARD	National Bank for Agriculture and Rural Development
NPA	Non-Performing Asset
NHB	National Housing Bank
RWA	Risk Weighted Assets
SIDBI	Small Industries Development Bank of India
SLR	Statutory Liquidity Ratio
TED spread	Treasury Euro Dollar spread
X 12 ARIMA	X 12 Autoregressive Moving Average

Bibliography:

Anh, VO Thi Quynh [2011], Countercyclical capital buffer proposal: an analysis for Norway Financial Stability Research Department Staff Memo 3/2011 Norges Bank

Bank of International Settlements [2010], A global regulatory framework for more resilient banks and banking systems, Basel Committee on Banking Supervision

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

Chakrabarty, K.C. [2011], 'Post-Crisis: The New Normal' – Key note address at RBI-Banque de France Seminar held at Paris on November 08, 2011

Drehmann M., C. Borio, L. Gambacorta, G. Jimenez and C. Trucharte [2010], Countercyclical capital buffers : Exploring options, *BIS Working Paper 317*. Bank of International Settlements

Drehmann, Mathias, Claudio Borio and Kostas Tsatsaronis [2011], Anchoring countercyclical capital buffers: the role of credit aggregates, *BIS Working Papers No* 355, Bank of International Settlements

Edge, Rochelle M. and Meisenzahl, Ralf R.[2011], The Unreliability of Credit-to-GDP Gaps in Real-Time: Implications for Countercyclical Capital Buffers. *FED Working Paper No. 2011-37.* Federal Reserve Board, Washington, D.C.

Gopinath, Shyamala [2010], Macroprudential Approach to Regulation – Scope and Issues' - Paper presented at the ADBI-BNM Conference on 'Macroeconomic and Financial Stability in Asian Emerging Markets', Kuala Lumpur, on Aug. 4, 2010

Gopinath, Tulasi and A. K. Chaudhary [2012], Counter Cyclical Capital Buffer Guidance for India, *RBI Working Paper 12 / 2012* Reserve Bank of India

Keller, Joachim: [2011], BCBS proposal for a countercyclical capital buffer: an application to Belgium, *Financial Stability Review*, National Bank of Belgium

Mishra, Rabi N. and G. Jagan Mohan [2012], Gold Prices and Financial Stability in India**.** *RBI Working Paper No. 02/2012*, Reserve Bank of India

Repullo, Rafael and Jesus Saurina [2011], The countercyclical capital buffer of Basel III: A critical assessment, *CEPR Discussion Paper No. 8304*, Centre for Economic Policy Research

Reserve Bank of India [2011], Handbook of Statistics on Indian Economy 2010-11

Reserve Bank of India [2011], Macroeconomic and Monetary Developments, December.

Sarel, M [1996], Nonlinear Effects of Inflation on Growth, Vol 43,No. 1, *IMF Staff Papers*. International Monetary Fund.

Sinha, Anand [2011], 'Reflections on Regulatory Challenges and Dilemmas' – Address at FICCI-IBA Conference on "Global Banking: Paradigm Shift" at Mumbai on August 24, 2011

Subbarao Duvvuri [2010], ‘Post-crisis Reforms to Banking Regulation and Supervision – Think Global, Act Local’ - Inaugural address at the FICCI-IBA Conference on ‘Global Banking: Paradigm Shift’ on September 7, 2010

Subbarao, Duvvuri [2010], Dilemmas in Central Bank Communication: Some Reflections Based on Recent Experience – Second Business Standard Annual Lecture at New Delhi on January 7, 2011

Subbarao, Duvvuri [2010]: Five Frontier Issues in Indian Banking – Inaugural Address at ‘BANCON 2010’ in Mumbai on December 3, 2010