DVARA RESEARCH

Modernisation of India's Banking Sector

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Abstract

Banks in India, whether large or small, have traditionally been required to adopt similar strategies to expanding their banking businesses. These strategies have been characterised by an almost exclusive Originate-To-Hold-till-Maturity (HTM) approach to building their asset books, with origination strategies that have often been high cost and high risk in nature and resulting in several anomalies that are currently plaguing the Indian banking system. This paper seeks to lay out a set of ideas that look at root causes of bank performance, which will then pave way for the modernisation of the sector. At the heart of these recommendations is an attempt to go back to first principles of banking and to reflect on what banks' managements and boards (notwithstanding their ownership patterns), and the banking supervisor need to focus on in order to set the course for a globally competitive banking sector for India. Some of the important recommendations pertain to a more focused adoption of approaches and tools that help reveal the true costs of origination which will then lead to better risk-based pricing, and various steps to be taken to reimagine the role of full-service banks from being 'risk originators' to 'risk aggregators' that are well equipped to actively rebalance their portfolios and use diversification as a strategy for effective risk aggregation.

Notes on the Indian Financial System
Note 5, October 2016

Executive Summary and Key Recommendations

India's banking sector is characterised by a few large national banks and many smaller banks of a regional nature, all of which have traditionally been forced to adopt similar strategies in expanding their banking business. Such strategies have been characterised by an almost exclusive Originate-To-Hold-till-Maturity (HTM) approach to managing asset books in an environment where a significant portion of credit continues to be targeted to specific 'priority' sectors at artificially low prices based on policy mandates. These high cost and high risk approaches have resulted in several anomalies that currently plague the Indian banking system. The high accumulation of non-performing assets on banks' books and the continued multi-year government-led capital infusion are only symptomatic of these anomalies. This paper seeks to lay out a set of ideas that look at root causes of bank performance, which will then pave way for the modernisation of the sector. At the heart of these recommendations is an attempt to go back to first principles of banking and to reflect on what banks' managements and boards (notwithstanding their ownership patterns), and the banking supervisor need to focus on in order to set the course for a globally competitive banking sector for India. Below is a summary list of recommendations.

1. Banks must undertake better risk-based pricing of their loan assets and for this, banks need to rely on processes and frameworks that reveal the true costs incurred in originating loans for various borrower profiles and asset classes. These frameworks include Matched Fund Transfer Pricing (MFTP) to understand cost of funds, Activity Based Costing (ABC) to understand transaction costs, and Risk-Adjusted Performance Measurement (RAPM) for measuring the cost of equity.

2. In its risk-based supervisory process, the RBI must move away from detailed instructions in its Monitorable Action Plan (MAP) and shift towards an approach of specifying targeted risk scores for each bank based on its unique risk position. As a prudent target to place on banks, RBI can focus on ensuring that Systemically Important Financial Institutions (SIFIs) consistently meet low risk scores, while non-SIFIs have more leeway to take on risker endeavours and therefore are to meet higher capital norms commensurate with their riskiness.

3. RBI must provide differential provisioning (both standard and impaired assets) and asset classification norms that reflect the underlying riskiness of each asset class.

4. RBI must require banks to demonstrate IFRS parallel run on their books, and also require the 21 new bank licensees to become compliant with IFRS from start of business to prevent the establishment of legacy systems.

5. Banks will need to be permitted to move away from an exclusive originate-and-hold-till-maturity strategy and gradually start to document all their loans using debenture / bond documentation so that the liquidity of their balance sheet improves. Credit facilities documented as bonds or Pass-Through Certificates (PTC), whether originated directly or purchased in the secondary markets should be permitted to be held to maturity (HTM) based on declared intent. To this end, there is no longer a need for an artificial distinction between the banking book and the trading book that prevents banks from holding bonds in the former. RBI or FIMMDA must develop and publish Standardised Debenture Trust Deed (DTD) templates that can be used by banks for bonds and loans to improve investor confidence in lower rated bonds and the tradability of loans.

6. There is a need to reimagine the role of universal banks as one that is no longer engaged as risk originators but rather as being risk aggregators, with freedoms to rebalance their portfolios based on risk-profiles and diversification outcomes that each bank decides for itself. Tools such as the Generalised Herfindahl-Hirschman Index (HHI) are useful for banks in quantifying the extent of diversification in portfolios containing a mix of assets that are correlated to various degrees. It is worthwhile to consider the use HHI as a measure of concentration risk, as has been used by the U.S. Department of Justice in its Horizontal Merger Guidelines[2].

7. RBI must require greater levels of disclosures from all banks with regard to concentration levels to each segment/sector, largest counterparties, as well as results of stress tests, both at an overall balance sheet level as well as at a segmental level at least annually so that these banks compete with each other on the strengths of their balance sheets alone, in a level playing field where no entity gets favoured over others due to lesser disclosure requirements.

8. Banks must equip themselves with instruments such as credit derivatives for better risk management of their portfolios. The permission from the RBI to use CDSs for loans held on banks' books would make CDSs much more useful as a risk management tool, and this is especially so for regional banks who can purchase CDSs from large national banks who are better placed to warehouse those risks that regional banks are exposed to.

9. Banks must be permitted to hedge commodity price risks on their agri lending portfolios and offer them to their customers on an OTC basis. In order to permit this, the Government can notify agri-commodity futures and options under the "Any other business" category of the Banking Regulations Act.

10. In order to guard against large scale defaults resulting from catastrophic events, banks must work closely with insurance companies to purchase bank-wide portfolio level insurance against events such as large scale rainfall failure on a regional or national basis, instead of having an expectation that relief would be provided from national or state budgets.

Introduction

These are challenging times for the banking sector in India, a period characterised by low profitability and rising impairment of assets. Return on Assets (RoA) of Public Sector Banks declined to a low of 0.46% in 2014-15. Gross NPAs of scheduled commercial banks stood at 5.1% of total gross advances in September 2015 while stressed advances (a combination of NPAs and restructured assets), stood at 11.3%. Public sector banks have continued to display the highest levels of stressed advances at 14.1% in September 2015, followed by private sector banks at 4.6%. The banking sector experienced a slowdown in balance sheet growth in 2014-15, a trend that had set in since 2011-12[3].

We also note that the traditional banking business model will face some threat going forward. An analysis[4] found that if all Current Account and Savings Account (CASA) deposits of banks were to be invested in risk-free 10-year Government securities, then the margins would be greater than the pre-tax profits of the banking system - indicating that the low cost deposits are a significant factor contributing to the risk absorption capacity of banks' balance sheets. Dr. Raghuram Rajan makes a reference to this 'grand bargain'[5]: "*Access to depositors gives banks a source of low cost financing. In return for this, made possible in part by privileged access to state institutions, banks are required in India to fulfil certain social obligations such as lending to the priority sector, as well as meeting prudential norms such as statutory liquidity ratios that also have a quasi-fiscal objective of funding the government. This is the grand bargain underlying the treatment of banks in India*". The "grand bargain" where cheap deposits were available to banks in an environment marked by low competitive intensity, in exchange for financing Governments and priority sectors of the Government is unravelling with significantly more competition expected for the CASA business. This competition is particularly likely to be sharp from the newly licensed category of Payments Banks whose sole focus will be on deposits and payments. Many of these new banks are expected to exploit the adjacencies with their telecom businesses and significantly increase the outreach of the banking sector and ease of depositing small amounts, frequently. Even over the past few years, there has been a "flight of CASA" to a few banks that are perceived as being strong (Figure 1[6]). Without the cushion of CASA, there will be greater emphasis for stand-alone profitability of the core lending business - both corporate and retail.

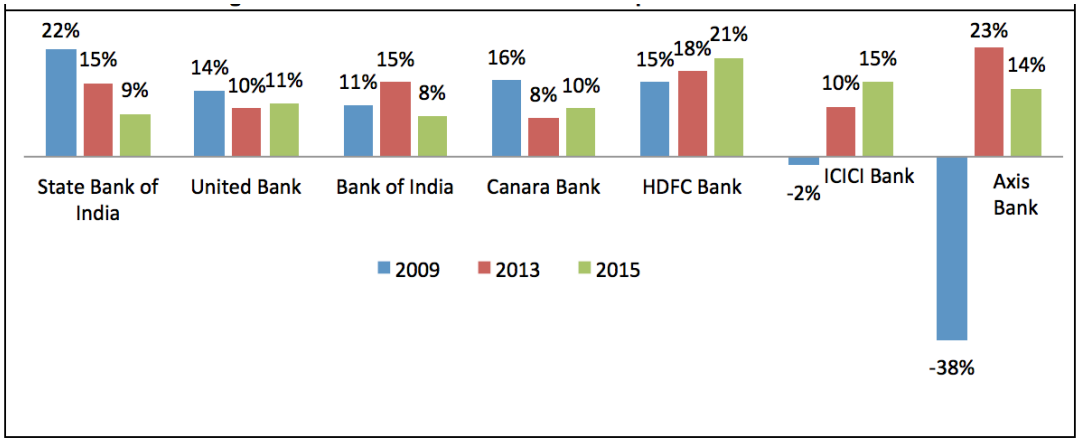

Figure 1: Annual Growth Rates in CASA Deposits for Select Banks

Taking into account many of these trends, a number of measures have been launched by the RBI and the Government, notably towards recognising and providing for bad loans across the board

and also regulatory reforms specifically aimed at Public Sector Banks under the "Indradhanush" package announced in August 2015[7]. While all of these measures are important, they stop short of addressing the root cause of troubles in the banking sector. NPAs reflect the outcome of decisions made several years ago by banks and while the current debates on provisioning levels are important from the perspective of assessing the fair value of banks, it does not examine the conditions under which these assets were originated and monitored and indeed, how we ensure that these issues are not recurrent themes in the Indian banking sector.

This paper aims to lay out some pragmatic measures to improve the management of banks, notwithstanding their ownership patterns. These are recommendations largely aimed at management of banks and in line with best practices of global banks. Overall, there is a global trend towards making accounting information more relevant by an increased acceptance of fair value accounting (through US GAAP and IFRS). There is also greater recognition for the role of the risk management function within overall corporate governance frameworks and spanning the three buckets, namely the board, the firm-wide risk management function, and the independent assessment of risk governance[8], and also attempts to rein in misconduct stemming from mis-sale of financial products, violations of rules, and manipulation of financial markets[9].

In addition, we also evaluate the supervision environment faced by banks and make some recommendations on how the supervisory regime can enable banks to reveal more information on an on-going basis about the true performance of the bank as well as create an environment where more capabilities are getting built within bank managements. Over the past few years, there has been a definitive shift towards risk-based supervisory approaches. This has been driven by Basel II requirements on banking regulators to undertake the Supervisory Review and Evaluation Process (SREP) of supervised banks, which includes the review and evaluation of the bank's Internal Capital Adequacy Assessment Plan (ICAAP)[10], conducting an independent assessment of the bank's risk profile, and if necessary, taking appropriate prudential measures and other supervisory actions based on the severity of risks, requiring banks to follow through on a prescribed Monitorable Action Plan (MAP)[11]. However, the RBS framework is still historic and partial in its approach because, for example, in looking at credit risk while it does, for the first time, go to the performing book, it only examines the rating migrations that have already taken place, and uses as a measure of concentration risk, only the top twenty assets (See Annexure 1 for more details).

Getting this right has important consequences for the economy and the country. We continue to have fairly low levels of financial depth (credit-to-GDP) in several pockets of the country. States such as Bihar have an overall credit to GDP ratio of less than 16% despite the fact that it has one of the lowest levels of GDP in the country. It is arguable whether the binding constraint is the availability of credit or the opportunities available in the regional economy - but at very low absolute levels of credit availability, this may be a self-fulfilling prophecy. We need a banking sector that is capable of meeting the growth needs of all sectors and regions of the country and for this, the sector has to exhibit a high degree of resilience and profitability.

SECTION I: BANKS

This Section discusses measures that banks in India would need to adopt internally in order to improve their profitability and to maximise returns on capital that has been deployed into business, and focuses on three important building blocks that managements have to build capabilities for. These building blocks are covered below.

Pricing of Loans

Correct pricing of credit is key to achieving the best possible outcomes for asset performance, and pricing covers not just costs incurred for originating and servicing loans but also for risk premiums based on the asset class/ borrower profiles (credit risk). The costs involved in originating a loan are a combination of the costs incurred in borrowing of funds deployed for creating the loan asset, the costs involved in operating the business, such as rent, staff salary costs, technology costs and so on, provisioning expenses incurred based on the expected loss characteristics of the asset class and the risk-adjusted return on equity demanded by equity investors who provide the cushion for absorbing unexpected losses on the loan. These are summarised in Figure 2.

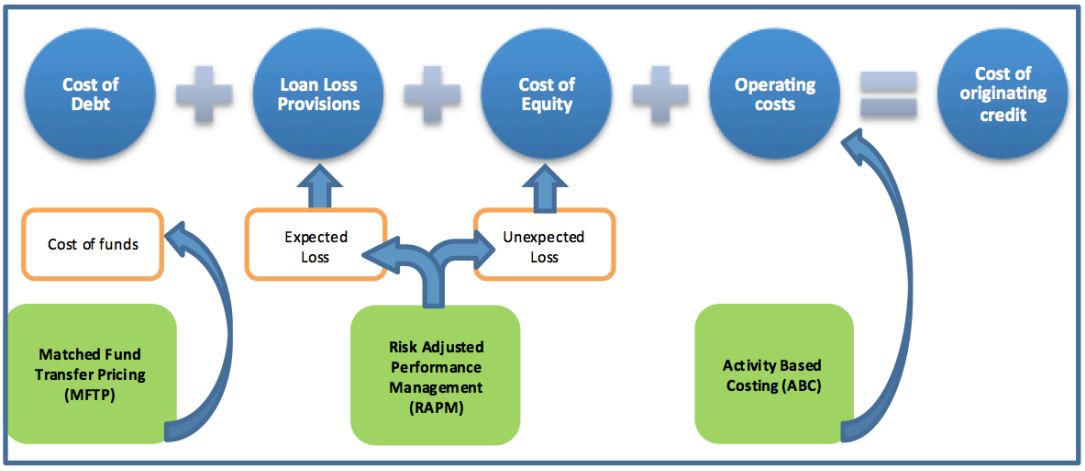

Figure 2: Costs Incurred in Originating a Loan

These costs vary across loan types and borrower profiles, across banking categories, and based on strategic differentiators that each bank chooses to focus on, such as the choice of funds (wholesale or retail), customer interface (branch-banking or electronic/mobile banking) and so on. The cost of administering a single Rs.100 crore loan to a corporation will be much lower than administering 1,000 loans of Rs.10,000 each to small borrowers. Similarly, operating cost ratios for public sector banks have been lower than that for private sector banks for reasons such as much larger scale of wholesale banking and treasury operations, and lower salary structures for senior management in public sector banks.

In order to price a loan, banks will need to know accurately, these above costs incurred in originating the loan. A study of such costs for originating a small ticket loan of Rs.10,000, indicated that the banking channel is an expensive way to create this asset. Further, it costs a public sector bank as much as 41.5% to deliver the Rs.10,000 loan to a small borrower (as % of loan size) while a AA-rated microfinance institution incurs 13.7% for the same[12]. While the chief differentiator contributing to such disparities in costs has been attributed to high

transaction costs on the part of banks, this is however not reflected in the pricing of the loan to the borrower.

While banks are free to compute their costs and consequently pricing, banks are not permitted to resort to any lending below the base rate. Figure 3[13] represents the proportion of loan accounts of scheduled commercial banks with interest rates less than 10% , indicating that about a quarter of all loans and about 10%[14] of all loans outstanding have been advanced at or below base rates.

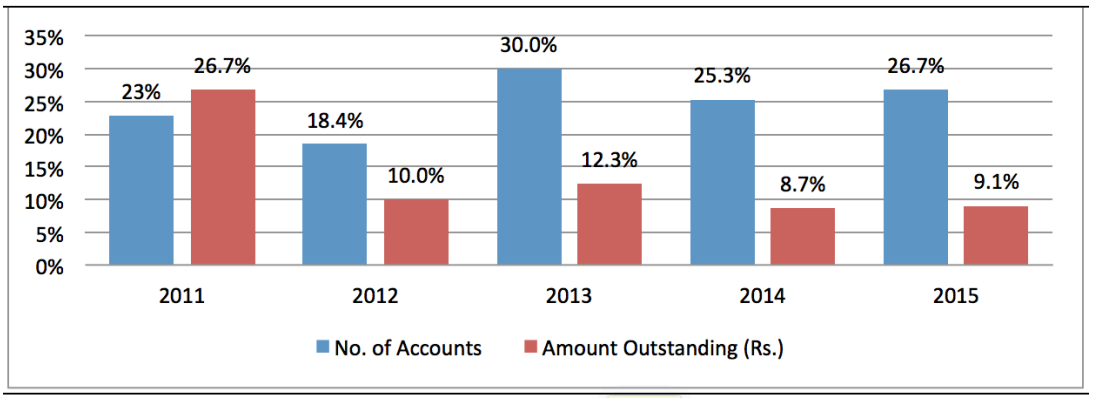

Figure 3: Loans with Interest Rate Less than 10% as Proportion of All Loans

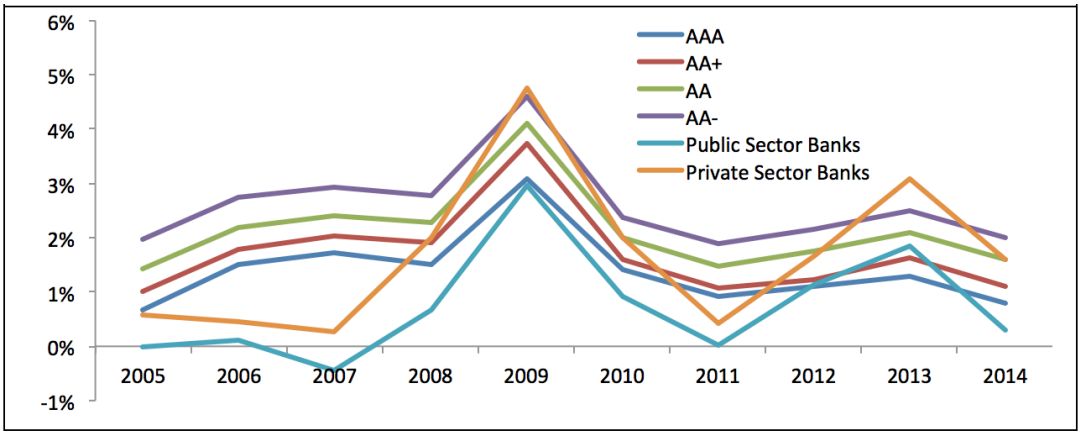

Figure 4: Risk Premiums on Bank Loans Vs Spreads of CRISIL Rated Corporate Bonds over 5-yr G-Secs

Similarly, Figure 4[15] points to loan pricing by private sector banks similar to AA or lower while public sector banks priced their loan books similar to AA+ or higher. Also, in specific comfortable years (2006-2008), both types of banks priced their loans better than AAA, indicating evidence for mispricing of bank books. The above figures give an indication of the severity of the issue and the need for corrective action.

This paper therefore discusses the following three building blocks which are essential in order to shed light on the nature of true costs of originating loans by banks as well as by other regulated financial institutions. These are discussed below in more detail.

1. Matched Fund Transfer Pricing

Funds form the raw material for a banking institution. In India, banks rely on CASA (current account and savings account) as a source of relatively low cost deposits, besides raising funds by issuing CDs, and bonds - these funds are used for creating loans that are mandated by the RBI to be priced with reference to the base rate, which in turn is decided by the banks themselves, and includes costs such as operating costs, negative carry on CRR, tenor premium and cost of funds. The base rate is to include all elements of the lending rates that are common across all categories of borrowers. Banks however were free to calculate their base rates either on the basis of average cost of funds, marginal cost of funds, blended costs of funds (liabilities) or any other acceptable methodology[16] until recently when the RBI placed a requirement to use marginal cost of funds based lending rate[17]. Several anomalies have existed within the base rate framework, such as an inability to transmit monetary policy interventions especially in the case where calculations are based on average cost of funds. Such an approach is in effect taking the costs incurred on liabilities used to create past loans, and using it for the pricing of loans that will be created in the future, whereas, to capture true costs, banks will need to consider the cost of borrowing concurrently with origination. The new RBI guidelines are a significant step forward in this regard and should mark the beginning of a shift for banks' pricing.

Matched Fund Transfer Pricing (Figure 5) aims at creating assets using transfer pricing rates that reflect their specific repricing and maturity characteristics in such a manner that it removes interest rate risks and liquidity risks from the various business lines and products and manages it all under one unit. MFTP as a process involves having an internal market place for money, namely the treasury, which quotes two-way prices across the entire yield curve from one day to say 30 years. All business units that originate for the bank will be required to automatically borrow or lend funds from the treasury that is matched in every manner for the purpose it is being used - matched with respect to liquidity, maturity, reset frequency, benchmarks).

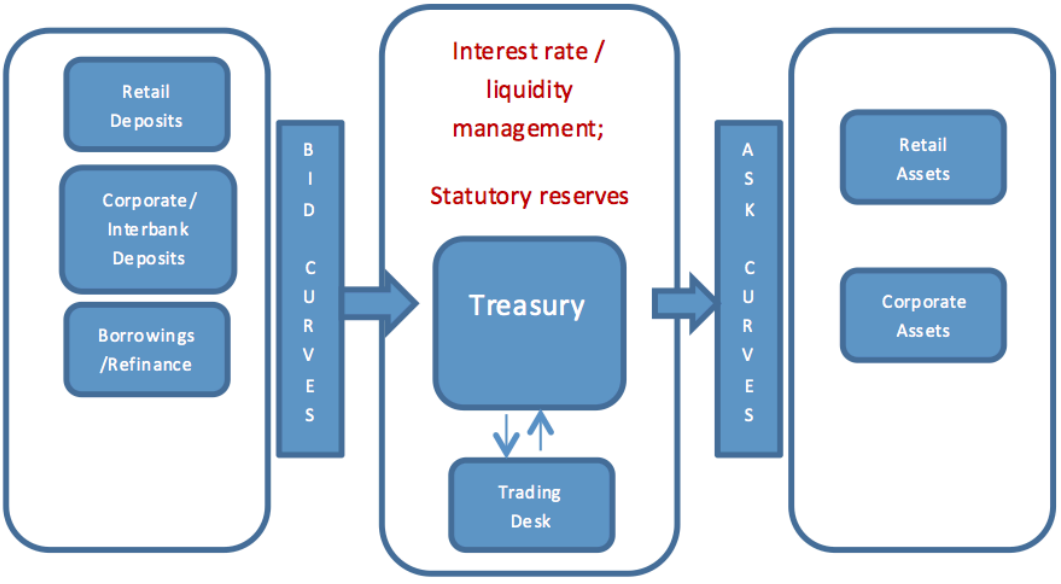

Figure 5: Framework for MFTP

By obtaining and tracking the yield curves of interest rates observed in the market (from data published by FIMMDA), and based on one's own ability to access these markets and the depth of these markets, a bank would set up its own bid-offer curve, which is intended to reflect, for

each maturity, the point of indifference between what the central treasury could borrow on its own and lend on its own, without taking on any credit risk, as well as the relative demand and supply imbalances of the internal demand for funds from the various units within the financial institution.

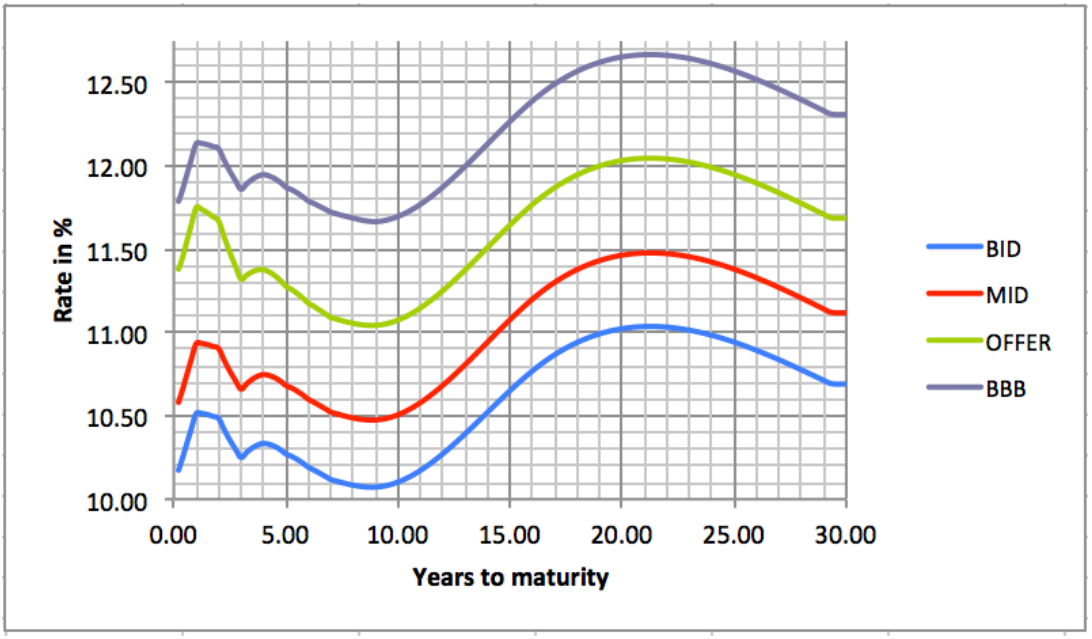

Figure 6: A Sample Bid Offer curve

Figure 6[18] is a possible bid-offer curve for an A rated Bank assuming that the A rated FIMMDA curve is sufficiently liquid and represents the rate at which an A rated bank/financial institution could borrow from the inter-bank market.

All business units focused on liabilities management will lend money to the Treasury at corresponding bid rates and all units focused on assets management will borrow money from the Treasury at corresponding offer rates. Statutory reserves are maintained by this Treasury and any negative carry due to these reserves is considered under the costs incurred on liabilities. This process allows the central treasury to aggregate all the offsetting transactions across the entire bank and decide on how much capital to allocate for the residual mismatches that exist. To avoid all conflicts of interest, the central treasury is to operate on a no-profit, no-loss basis, and to run a fully matched operation on an instantaneous basis. As a separate unit within the treasury there is often a trading unit which too faces the internal transfer pricing regime and acts as a bridge between it and the larger market. Such a unit is explicitly a profit centre and has capital allocated to it based on the extent of value that it puts at risk. While the Central Treasury unit regards the internal trading unit as a preferred trading partner it is normally expected to have the freedom to directly trade with the market as well so that an additional check is provided against deliberate mis-pricing by the internal trading unit.

In the process, interest rate risk and liquidity risk get moved to a central pool (the Treasury) where it is managed on an aggregate level, allowing the business units to focus on the credit risk component alone. MFTP reveals the relative demand and supply imbalances of the internal demand for funds from the various units within the financial institution, and is an essential pre-requisite for a bank to know its cost of funds - if funding costs are underestimated in the transfer

price, the business units originating loans may end up lending cheaper loans to customers in an unprofitable manner.

MFTP also aids in better monetary policy transmission. It has been observed in India that rate cuts by the RBI have not translated into cuts in base rates by banks. A report[19] by Bloomberg indicates that 43 out of 47 Indian banks had not lowered their base rates in response to two rounds of rate cuts by the RBI. While this may be attributed to the use of average cost of funds calculate its base rate, the requirement placed by RBI to adopt[20] marginal cost of funds approach to base rate calculations by April 1, 2016 would capture true cost of funds in loan pricing. This is expected to accelerate the full adoption of MFTP by all banks. However, banks will need to have robust MFTP frameworks in order to efficiently manage their funding costs in a marketplace that will change to adapt to the RBI guidelines. The desired outcome of marginal costing is that in pricing for instance a 1 year loan, the bank takes market benchmarks for borrowing 1 year money rather than what the bank actually incurs in terms of costs of raising money. To enable quicker adoption of MFTP, RBI can provide market benchmarks for risk-free rates.

2. Activity Based Costing

It will be critical for banks to know costs incurred for each asset and liability originated, such as for originating a Self Help Group (SHG) loan or a savings account opened at a branch. This cost is an essential component of overall costs incurred by a bank, and without knowing this component or without including this component into pricing, the bank will be unable to keep track of the real costs of its business and be assured that it is operating within its constraints in terms of expenses incurred.

While banks rely heavily on CASA as a source of funding, prior to deregulation of CASA interest rates, the average cost of CASA deposits in 2010, even for those banks that relied on CASA for 30-40% of their funding, stood at 5.83% for public sector banks and 5.59% for private sector banks[21]. In today's deregulated interest rate regime with interest calculated on a daily basis[22], costs of raising deposits (CASA and term deposits) for banks hovers around 6.04% for HDFC Bank[23], 6.25% for SBI[24], 5.86% for Axis Bank[25] and so on. The costs involved in raising Rs.100 as deposit through a BC channel were estimated[26] to be at 2.63% split evenly across the bank (0.82%), the BC Network Manager (0.96%) and the BC Agent (0.85%), and was found to be too high to breakeven (revenues estimated to be 1.42% for the entire channel). The RBI Committee on Comprehensive Financial Services for Small Businesses and Low-Income Households concluded that on the cost front for delivering credit, the picture is equally grim for both private sector and public sector banks with the cost of operations (not including interest cost) alone approximating 30% to make a one year loan of Rs.10,000[27]. Another study[28] found that the transaction costs for originating a small retail loan of Rs.10,000 varies greatly based on whether the intermediation is done by a bank, through its own branches, through an SHG or through an MFI.

Source	Channel	Transaction Costs for Bank	Additional Transaction Costs borne by Channel	Total Transaction Costs for Channel
Public Sector Bank	Bank Branch	32.39%	0.00%	32.39%
	SHG Linkage	0.46%	6.30%	6.76%
	MFI	0.50%	8.74%	9.24%
Private Sector Bank	Bank Branch	21.56%	0.00%	21.56%
	MFI	0.50%	8.74%	9.24%

There are wide variations in operating costs across types of institutions, business models and location of operations, all of which decide the costs of activities involved in originating a loan. While entry level salaries for clerical staff that operate a rural branch are similar for both public sector[29] and private sector banks at around Rs.25,000 per month, yearly increments and bonuses are considerably higher for senior and top management positions in private sector banks[30]. Field staff compensation for MFIs is around Rs.7,500 per month while for housing finance companies credit officers get paid up to Rs.25,000 per month[31]. This comparison does not capture the differences in roles performed by each of these employees, such as the added functions of raising deposits and clearing payments undertaken by bank staff. Therefore, Activity Based Costing enables banks to make better-informed decisions about cost-return trade-offs by linking their drivers of costs to the actual cost of originating their assets and liabilities.

In this context, it is to be acknowledged that banks are permitted by regulations to price certain loans below the base rate. Interest rates for small loans to farmers have been permitted to be below the base rate[32] when rates to large corporates with a far lower cost-to-serve, are restricted to be at a minimum of base rates. While these are policy imperatives placed by governments, from the perspective of stability that entails sustainable pricing, banks must instead be required to freely price farm loans based on their risk models, and therefore, the permission to price farm loans below the base rate should be withdrawn to improve interest rate setting processes within the banking system. Any subventions and waivers that are deemed necessary by the government are better off being channelled to end-beneficiaries by means of direct transfers instead of through interest subsidies or loan waivers through the credit delivery machinery[33]. Even in the delivery of subsidised credit, besides pricing distortions, other distortions have set in, one of them being that the distinction between labour and other factors of production results in landless labourers systematically facing higher costs of borrowing relative to land-owning farmers, because the manner in which direct agriculture lending targets are defined, expenditure to maintain self-supplied labour as a factor of production (health, food, life insurance and disability insurance premiums) for landless labourers and marginal farmers does not qualify under Direct Agriculture. These are instead considered as consumption expenditure unlike expenditure on fertiliser, agri equipment or machinery. This increased difference in costs of borrowing could be between 20-60% depending on the source of credit for the landless labourer or marginal farmer, as elucidated in the RBI Committee on Comprehensive Financial Services for Small Businesses and Low-Income Households[34].

3. Risk Adjusted Performance Measurement

While MFTP informs a bank about its cost of debt, and ABC informs about the cost of activities involved directly or indirectly in originating an asset, the Risk Adjusted Performance Measurement (RAPM) metrics inform whether capital is being allocated correctly for each risk, and whether adequate returns are being earned on it.

Capital serves as a cushion against losses that may be incurred by a bank during its functioning, default risk being the predominant source of such losses for banks that predominantly hold loan assets on their books. While banks in India have adequate capitalisation against minimum requirements mandated by Basel, India has indeed had a long history of government-aided capital infusion into public sector banks (including indirectly through the repression of the deposit rates for many years), the latest being the Central Government planning a budgetary allocation of Rs.70,000 crore over the next 4 years starting 2015, against an estimated extra capital requirement of Rs.180,000 crore over the next 3 years[35]. The rural cooperative banking system has also received about Rs.9,002 crore as part of implementation of the recommendations of the Task Force on Revival of Rural Cooperative Credit Institutions[36]. Such an approach to

capitalisation is suboptimal in many aspects and is a drain on government's budgets and reduces incentives for banks to manage their capital efficiently given the nature of risks they face.

On the liabilities side, the Deposit Insurance and Credit Guarantee Corporation (DICGC) has been unable to bring in risk-based premiums on deposit insurance, quoting[37] the lack of robust supervisory rating for insured banks especially co-operative banks which serves as an important input for DICGC's rating models and the restructuring processes that cooperative and regional rural banks have been undergoing (these form over 90% of insured banks, and Rs.3.21 billion in claims have been settled in 2014-15, all going for 30 cooperative banks that went into liquidation/ reconstruction/ amalgamation[38]).

Banks have to decide on the kinds of asset classes and product-mix that they want to hold on their balance sheets and decide on how much capital reserves will be maintained against these risks, over and above regulatory capital prescriptions in order to maximise the returns from their various businesses. Risk Adjusted Return on Capital or RAROC is the most commonly used RAPM measure based on the capital adequacy guidelines as outlined by the Basel Committee on Banking Supervision.

$$\text{RAROC} = \frac{\text{After-Tax Risk Adjusted Total Return} - \text{Expected Loss}}{\text{Economic Capital}}$$

RAROC serves both as an effective risk management tool as well as a performance metric, thereby helping boards and managements take decisions on strategy and growth. The risk adjusted return on economic capital can be calculated for each business unit and this would determine its profitability. The predicted estimate of RAROC could be used to determine whether a business unit should be expanded or contracted. The pre-requisites for risk-return model computations entail strong management information systems, validated risk rating models, robust portfolio management systems, sound transfer pricing mechanism and capability to estimate economic capital. Other measures in this regard are Return on Risk Adjusted Capital (RORAC), and Risk Adjusted Return on Risk Adjusted Capital (RARORAC).

Previous RBI Committees have recommended[39] that banks will need to migrate to an economic capital model for allocation of capital and for measuring the efficiency of capital. While the RBI is evolving the Risk-Based Supervision (RBS) framework for banks, banks need to move to performance tracking and strategic decision-making using a risk-based approach. Risk-based supervisory approaches must require the use of risk-adjusted performance metrics that provide a measure of economic profitability of financial institutions with due consideration of different sources of risk and capital requirements. In order to undertake risk-adjusted performance management, certain requirements need to be in place in terms of skilling and capacity of risk management teams, as well as technology systems that can make disclosures such as those given in Annexure 2 possible. Annexure 2 provides examples of public disclosures made in annual reports of Deutsche Bank and JPMorgan Chase, and cover aspects such as economic capital allocated to different business units and different risks, as well as risk-weighted assets across credit risk, market risk and operational risk, disclosed along both Standardised and Advanced approaches under Basel III. In this context, this paper does not provide or discuss evidence for possible shortcomings in current capacities and powers of risk management functions within banks in India. However, this is an important lacuna as indicated by RBI's recent requirement on banks to ensure requisite certification of bank staff in specific functions including in risk

management and treasury operations[40]. Besides competence, a stronger and more decisive risk management function would entail measures such as representation on committees, the level of seniority and pay accorded, it's positioning vis-a-vis business / lending functions and its ability to veto lending proposals.

4. Diversification as a strategy for the role of risk aggregation by universal banks

Since large national level banks hold credit risk from various geographies and sectors on their banking books with the intention of holding to maturity, they rely on portfolio diversification as an effective risk mitigation strategy. This is especially important in the absence of catastrophe insurance markets. Banks' risk managers can rely on a well-developed variance-covariance matrix for computing the diversification (or lack thereof) of the assets in the books of the bank. Once the variance-covariance matrix is in place, it becomes possible to examine concentration risk more completely and to compute indicators such as the Diversity Score[41] using the Generalised Herfindahl-Hirschman Index (HHI) and to factor that into the calculation of the riskiness of a bank.

There is a need to reimagine the role of universal banks as one that is no longer engaged as risk originators but rather as being risk aggregators, with freedoms to rebalance their portfolios based on risk-profiles and diversification outcomes that each bank decides for itself. Tools such as the Generalised Herfindahl-Hirschman Index (HHI) are useful for banks in quantifying the extent of diversification in portfolios containing a mix of assets that are correlated to various degrees. It is worthwhile to consider the use HHI as a measure of concentration risk, as has been used by the U.S. Department of Justice in its Horizontal Merger Guidelines[42].

SECTION II: REGULATORS AND POLICY MAKERS

This Section discusses measures that regulators and policy makers in India would need to consider in order to improve performance and efficiency of banking in India.

Improving Asset Books

Current asset classification and provisioning norms and norms for risk weighting are not differentiated along the lines of asset classes. An asset class can be understood to be a combination of customer segment, product design and collateral. NPA recognition norms must depend on the nature of asset and must not be a blanket requirement such as the current 90-day qualification. This is particularly true where the underlying business may have seasonality associated with it. For instance, in comparing two asset classes, namely the unsecured microfinance joint liability group loans and the loans against commercial vehicles, the behaviour of the former indicates that a PAR 30 in itself would be enough to classify an asset as non-performing, while for the latter, anything below a PAR 180 does not indicate that the asset will necessarily turn non-performing[43].

RBI must provide differential provisioning norms based on the underlying level of riskiness of the asset class (both standard and impaired assets) and make applicable to all institutions originating such assets, irrespective of legal differences in the nature of institutions. This would however be complete only by other relevant regulators such as the NHB bringing into alignment provisioning norms for institutions regulated by them.

1. Improving Provisioning based on Expected Loss models

For provisioning for standard assets, RBI can provide specific guidance on provisioning norms at the level of prominent asset classes given that different customer-asset combinations behave very differently from each other. For instance, lower ticket size home loans (<Rs.0.5 million) of public sector banks have a relatively higher historical NPAs (4.4% as on March 31, 2014) while home loans with ticket sizes > Rs.2.5 million exhibited lower NPAs of 0.62%, with the former having a higher volatility compared to the latter (110bps versus 39 bps in GNPA change in the year)[44], indicating that the former will require higher risk capital kept aside under prudential norms. Given the fact that historical NPAs on Micro Finance Joint Liability Group (JLG) loans are in the region of 0.2%[45], and assuming loss given defaults to be 100%, the risk based estimate of the NPA Coverage Ratio for this asset class would be 100% of historical NPAs or 0.2%. Also, over the last decade, since the gross NPAs in the agriculture segment have been higher than banks loans to the non-agriculture segment on an average by 1.21 times, the standard asset provisioning, for all agriculture exposures including KCC should be set at 0.5% (1.21 times of 0.4%)[46].

Accounting Standards traditionally have relied on an 'incurred loss' model to recognise losses where an event of default, such as non-repayment of dues for 90 days triggers provisioning for NPAs. In terms of the accounting standard for recognising credit losses, the IAS 39 - Financial Instruments: Recognition and Measurement, a financial asset is impaired and impairment losses are incurred if and only if, there is objective evidence of impairment as a result of one or more events (i.e., loss event/s) that occurred after the initial recognition of the assets, and that loss event (or events) has an impact on the future cash flows of the financial asset that can be reliably estimated. Under the "incurred loss" based approach, more often than not, lenders wait for certain trigger events to happen such as default, delinquency in interest or principal payments, significant financial difficulty of the borrower, etc., before losses get recognised. This effectively delays loss recognition and overstates the value of the loan as it is carried in the banking book

at amortised cost while there was enough indication of a potential loss that can be expected in the near future. There is a need for earlier recognition of potential losses to get factored into the value of the asset so that the balance sheet reflects a more realistic picture of its loan book. While the value-at-risk for assets in the trading book is calculated at a 99% confidence level based on a 10-day time horizon, that for assets in the banking book are calculated at a 99.9% confidence level on a one-year horizon.

For all loan assets, changes in credit ratings, well ahead of an event of default (even when ratings are well within the investment grade range), can act as appropriate triggers for the early detection of stress at a point where some useful steps could be taken by the bank to preserve value. And, since Bank Loan Ratings are now almost ubiquitous for corporate assets, not only is this kind of detection now possible but so is the determination of the provisioning requirements for these assets right at that stage itself, based directly on the risk adjusted net present value of the asset, well before any default or incipient default even becomes visible.

The Ministry of Corporate Affairs and RBI have recognised the urgent need to converge Indian Accounting Standards with International Financial Reporting Standards (IFRS) - the Ind AS has been recommended by RBI to be commenced for scheduled commercial banks from April 1, 2018 onwards. IFRS 9 represents a significant move in that it will require the computation of provisioning based on a forward looking Expected Credit Loss (ECL) impairment model, even for the performing book. This is likely to result in significantly higher impairment provisions and therefore more capital requirements.

RBI through its Framework for Revitalising Distressed Assets in the Economy[47], the Guidelines on the Joint Lenders Forum (JLF) and Corrective Action Plan (CAP)[48], the Strategic Debt Restructuring Scheme[49], has put in place machinery for the rectification and restructuring of stressed assets on banks' books, including through conversion to equity, and stricter norms for classification of wilful defaulters[50]. However, just as with standard assets, there is a need for recognising and incorporating expected losses into the loss recognition in restructured assets without waiting for the asset to become an NPA according to the assumptions made in the restructuring scheme.

Also, the RBI has indicated its interest in moving to a dynamic provisioning framework in which banks will need to make dynamic provisions which would be the difference between the long run average expected loss of the portfolio for one year and specific provisions[51] made during the year. Thus, this will ensure that every year the charge to profit and loss account on account of specific provisions and dynamic provisions is maintained at a level of alpha times outstanding loans i.e., expected losses[52].

While dynamic provisioning may be planned for implementation during better times, the RBI must require banks to demonstrate IFRS parallel run on their books, and also require the new licensees to become compliant with IFRS from start of business to prevent the establishment of legacy systems especially given the impending IFRS requirements on banks and NBFCs.

With the accounting for financial assets moving towards better capturing the effects of potential impairment for the remaining life of the asset either through mark-to-market and expected loss approaches, there is broad consensus that these measures will ensure adequate cover for expected losses in the form of better provisioning, while unexpected losses are to be covered by capitalisation[53] and by more efficient use of banks' capital.

2. Removing the distinction between banking book and trading book, and documenting Loans as Debentures

Loans are typically held-to-maturity by a bank. Many a times, for various reasons documented earlier in this report, such assets are under-priced and therefore if and when a bank needs to rebalance its portfolio, these assets are unable to find favour in the marketplace for tradable assets. While there is broad acknowledgement of the costs and risks of such a hold-to-maturity strategy, and tools such as ABC and MFTP will help banks to better price their loans, there is also a need to concurrently enable banks to acquire assets and build their performing books from secondary market sources as well as from other banks and specialised NBFCs. For this to happen, bonds and Pass-Through Certificates (PTC), whether originated directly or purchased in the secondary markets should be permitted to be held in the banking book of a bank based on declared intent. It should no longer matter whether the documentation of the asset is as a loan or a bond for it to be kept in the banking book under the HTM category. According to the US GAAP for instance, investments in debt securities shall be classified as HTM only if the reporting entity has the positive intent and ability to hold those securities to maturity. If, for instance, the investor no longer has the ability to hold certain securities to maturity and will now hold them for resale, those securities would be reclassified from HTM to AFS and the security is transferred at its fair value on the date of transfer. Because an entity is expected not to change its intent about a security, especially with regard to HTM securities, the reassessment requirement focuses on the entity's ability to hold a security to maturity[54].

The need to rebalance is primarily for the banking book given its opacity and a clearly laid out process for moving assets from the HTM status in the banking book to an AFS status will need to be specified for this to happen. This will become essential once IFRS 9 comes into place and Risk Based Supervision becomes the norm as this will be one of the principal ways in which concentration risk on the banks' books will need to be managed.

An essential prerequisite to improving a bank's ability to rebalance its asset portfolios is the tradability of loans. With very highly rated (AAA, AA+) issuers and borrowers, the investors and lenders take comfort in the rating and governance of the issuer/borrower, and hence there is a fair degree of trading that happens for highly rated corporate bonds. This is however not the case with lower rates bonds, or with loans. When the issuer of the bond is rated lower, investors are more particular about the quality of the debenture trust deeds (DTD) and the security documentation. The DTD captures the entire legal base for the transaction, including reps, warranties, indemnities, covenants, events of default, consequences of events of default, security conditions and so on, as well as the duties, roles and responsibilities of the trustee. Often, an investor is not comfortable with another investor's documentation, and this adversely affects the tradability of the instrument. Therefore, Standardised Debenture Trust Deed (DTD) templates can be developed by RBI, FIMMDA or IBA that may be used by banks for bonds as well to improve investor confidence and the tradability of loans. There are important learnings from the international jurisdictions in this regard. Most syndicated loans follow a standard London Market Association (LMA) format, and this approach can be used to arrive at a consistent format for DTDs, loan agreements and security documentation.

3. Strengthening Disclosure requirements

Irrespective of how well national banks execute their origination and their balance sheet management strategies, given their systemic importance and the need to ensure that any signs of incipient weakness are quickly identified and dealt with, it is very important to ensure that there is complete transparency with regard to financial statements of these financial institutions, including weaknesses stemming from loans that are under-priced as a matter of policy. Such

transparency also ensures that the competition between different types of institutions happens on a level playing field and that the apparently stronger player is indeed inherently stronger and not simply being protected by its lower levels of disclosure. Ind AS provides for extensive disclosures, notably with regard to financial instruments and their attendant risks (Ind AS 107), fair value measurement (Ind AS 113) and requirements relating to consolidation (Ind AS 110, 111 and 112), and banks will need to make significant efforts to meet these requirements[55].

The extent of disclosure provided in Deutsche Bank's annual report is provided in Annexure 2 and serves as a good end-goal to aspire to for banks in India. It publically discloses the economic capital consumed by various business units and under each unit, that consumed by various types of risks.

Banks must also be required to disclose concentration levels to each segment/sector and largest counterparties in their financial statements and reports, as well as stress test results both at an overall balance sheet level as well as at a segmental level at least annually.

SECTION III: IMPROVING RISK MANAGEMENT BY ENABLING THE USE OF DERIVATIVES AND INSURANCE

All credit institutions that lend will have to manage systematic risks that face that face a particular sector or region or customer segment, such as rainfall failure and other weather risks, and commodity price risks which can impact the livelihoods of a large numbers of borrowers simultaneously and cannot be eliminated. Irrespective of whether banks and other credit institutions focus on, and build capabilities in originating larger or smaller loans or a combination of both, they will end up building portfolio concentrations that are unhealthy and which will attract a higher level of capital for housing these risks. A hold-to-maturity approach to managing loan books without actively rebalancing portfolios, further exacerbates the problem. However these risks can be mitigated by hedging against these risks at a portfolio level through credit derivatives and insurance.

1. Credit Risk Derivatives

Current Credit Default Swap Guidelines[56] are applicable only for corporate bonds and due to the small size of the corporate bond market, it is a foregone conclusion that while highly rated and/or highly liquid bonds of the largest corporates dominate the corporate bond market, the need for hedging credit risk on account of holding these bonds is not as pressing a concern for banks as is the case with their remaining investment and asset portfolios. Banks have traditionally been long-risk on a significant portion of their balance sheet which comprises loans held to maturity, and bonds that are usually not held till maturity (they are usually AFS or HFT). CDSs can serve as a powerful risk management tool for banks in India but for this, CDSs can be permitted to be purchased by banks to hedge their corporate loans in their banking books. These loans would entail a much larger universe of corporates including sub-investment grade companies, than only those that have highly liquid bonds traded in secondary markets.

However, permitting CDS on loans would naturally pose the question of whether this would only be an imperfect hedge due to the fact that while the underlying asset itself cannot be marked to market, the CDS necessarily needs to be, and therefore this would lead to volatility in the income statement due to accounting mismatches between the hedging instrument and the hedged item. One possible way to overcome this may be by requiring such loans to be measured at fair value on a recurring basis (as is broadly required under the impending IFRS regime), the frequency of which can be in alignment with the mark-to-market requirements for CDS. Since these loans are intended to be held to maturity by the bank and therefore the bank is indifferent to future opportunities to profit from changes in the loan's fair value, having an ability to protect it by using a CDS would greatly increase demand for the product.

In the case of smaller banks that are exposed to its own local systematic risks, CDSs would help greatly to transmit the individual borrower level credit risk exposure of these small banks to other institutions that at a national level would be well-equipped to hold such risks. These instruments, if permitted to be written on loans, would enhance risk management capabilities of these small financial institutions and reduce considerably the chances of single entities failing.

2. Commodity Derivatives

Banks with large agriculture lending exposures have to house significant commodity price risks in their portfolio. While RBI's approach to mitigating this risk is to require banks to encourage and to educate large agricultural borrowers to hedge their agri-commodity price risk through entering into options contracts on commodity exchanges[57], all other agri-borrowing are left

exposed to this. Banks are prohibited from trading in goods and are therefore not allowed to trade in the commodity futures market[58]. With better supervisory capabilities brought about by the merger of the Forward Markets Commission with SEBI, the time is opportune for amending the Banking Regulation Act to permit banks to trade in agri-commodity options and hedge their commodity price risks.

3. Catastrophe Insurance

All Banks are warehousing significant rainfall and commodity risks arising out of their agricultural lending activities under PSL. Regional Banks such as cooperative banks, RRBs and small finance banks face even greater risks given their geographical and sectoral focus and concentrated loan portfolios that rely on servicing of loans by cash flows from the local economy.

Risk management measures available in this regard are currently restricted to tools such as crop insurance purchased by farmers to cover their farm loans, as well as commodity derivatives. There is a need for Banks to protect their entire rural lending portfolio against shocks such as rainfall failure, earthquakes, and cyclones, through the purchase of catastrophic portfolio insurance so that in the event of such a shock, a Government bailout (that severely distorts credit culture) would no longer be the only option available. While there is no regulatory restrictions that are preventing banks from purchasing such portfolio level protection against catastrophic events, regulators can encourage product development by bringing together market participants, including overseas participants with whom nation-wide risks can be laid off.

Conclusion

This paper has sought to lay out urgent measures that banks as well as regulators and the government need to take in order to build out a banking system that is strong on resilience and profitability. While many of these measures are already in place in limited contexts, such as within internal risk management or treasury operations within some better-performing banks, there is a need for a concerted effort by all participants to move towards complete adoption across the banking system. There will be a requirement placed on banks to significantly build their management capacity and technologies, and on regulators to ensure strong supervisory capacity if the banking system is to recover from the present crisis and re-emerge strong to meet the needs of the real economy.

Annexure 1

Observations on reporting of sector-level concentrations by banks in their OSMOS Returns[59] submitted to RBI

Return			**Remarks (with respect to coverage of concentration of exposures)**
Return No.	**Tranche 1**		
1	ALE	Report on Asset Liability and off-balance sheet exposures	No sector-specific concentration disclosures required. Disclosure limited to categories such as exposure to real-estate, credit risk concentration in top 10 counterparties (banks &FIs, corporates) to derivatives
2	RCA	Report on Capital Adequacy Basel I	Risk weights for credit risk assigned based on the RBI directive[60] on the same. Categorisation for risk weights does not differentiate between asset classes
4	RAQ	Report on Asset Quality	* Disclosure of impaired credit (ie, standard, substandard, doubtful and loss assets) for10 sectors: - Agri, SMEs, other PSL, Weaker sections - Export trade, banks, NFBCs, Central/State Govts, food credit, other PSUs - All others * Top impaired credits * Exposures to sensitive sectors: investments and advances in capital markets, real estate sector, MBS, other securitised assets, exposures to NHB, HFCs * NPAs and provisions held for listed and unlisted non-SLR securities, equity; and their ratings-wise categorisation * Industry-wise exposures
5	RLC	Report on large credits	All borrowers having adjusted total credit exposure in excess of 15% of bank's regulatory capital; a minimum of 20 large credits to be reported if this qualifier is not met
6	RCL	Report on connected lending	Credit and equity exposure to subsidiaries, associates Exposures to significant shareholders and their interested/ related firms
7	ROC	Report on ownership and control	Details of shareholders, directors, executive officers
	Tranche 2		
	DSB (Overseas)		
16	PCI	Report on problem credits and investments	List of customers, asset classifications and provisions for: - Customers' credit of USD 2 million and above - Customers' investments of USD 1 million & above
17	RLE	Report on large exposures	Accounts of USD 5 million & above, between USD 1 million and 5 million, investments > USD 1 million
	Other DSB Returns		
21	RBS1	Risk based supervision reports[61]	* Clientele-wise Credit concentration: o/s, impaired credit, loss provisions, net NPAs for: Retail loans: -Housing loans - Loans for consumer durables - Credit card receivables - Auto loans - Other personal loans (personal purposes, education, professional, consumption, etc) * Borrower rating-wise, distribution of standard advances based on internal ratings (used by banks for credit decision and pricing; attributes of the rating and pricing to be detailed in terms of PLR), unrated advances, for market risk * Internal Rating-wise distribution of non-SLR investments (used by banks for investment decision, attributes of the rating to be provided) * Loan sales and securitisation to ARCs and 'to others' * Details of domestic and international credit card business of bank & subsidiaries - o/s, NPAs, provisions, recoveries
22	BSA	Balance sheet analysis	Sector-wise NPAs (slightly more detailed sectors as compared to that required in Return No.4), Quantum-wise gross NPAs (9 categories from Rs.100 crore), suit-filed accounts (based on size, age of loan), cases with BIFR, required to be submitted. NPAs across Overseas, Global.
Other Returns			
27	ROBU	Return on offshore banking units (from a few select banks only)	Country-exposures, top 20 borrowers, top 20 NPA Accounts

Annexure 2

Deutsche Bank Economic Capital Table 2013 in % (unless stated otherwise) from Annual Report								
	Corporate Banking & Securities	Global Transaction Banking	Deutsche Asset & Wealth Management	Private & Business Clients	Non-Core Operations Unit	Consolidation & Adjustments	Total in m.	Total
Credit Risk	17	7	1	14	5	0	12,013	44
Market Risk	18	1	6	11	5	7	12,738	47
Operational Risk	9	0	2	3	5	0	5,253	19
Diversification Benefit	(7)	(1)	(2)	(3)	(3)	0	(4,515)	(17)
Business Risk	5	0	0	0	1	0	1,682	6
Total EC in m.	11,398	2,033	2,010	6,671	3,349	1,710	27,171	100
in %	42	7	7	25	12	6	100	0

Excerpt from Annual Report 2015 of JPMorgan Chase & Co

RWA rollforward

The following table presents changes in the components of RWA under Basel III Standardized and Advanced Fully Phased-In for the year ended December 31, 2015. The amounts in the rollforward categories are estimates, based on the predominant driver of the change.

	Standardized			Advanced			
Year ended December 31, 2015 (in billions)	Credit risk RWA	Market risk RWA	Total RWA	Credit risk RWA	Market risk RWA	Operational risk RWA	Total RWA
December 31, 2014	$ 1,381	$ 180	**$ 1,561**	$ 1,040	$ 179	$ 400	**$ 1,619**
Model & data changes[a]	(17)	(15)	**(32)**	(38)	(15)	–	**(53)**
Portfolio runoff[b]	(13)	(8)	**(21)**	(21)	(8)	–	**(29)**
Movement in portfolio levels[c]	(18)	(15)	**(33)**	(27)	(14)	–	**(41)**
Changes in RWA	(48)	(38)	**(86)**	(86)	(37)	–	**(123)**
December 31, 2015	**$ 1,333**	**$ 142**	**$ 1,475**	**$ 954**	**$ 142**	**$ 400**	**$ 1,496**

(a) Model & data changes refer to movements in levels of RWA as a result of revised methodologies and/or treatment per regulatory guidance (exclusive of rule changes).

(b) Portfolio runoff for credit risk RWA reflects reduced risk from position rolloffs in legacy portfolios in Mortgage Banking, (primarily under the Advanced framework) and Broker Dealer Services (primarily under the Standardized framework); and for market risk RWA reflects reduced risk from position rolloffs in legacy portfolios in the wholesale businesses.

(c) Movement in portfolio levels for credit risk RWA refers to changes in book size, composition, credit quality, and market movements; and for market risk RWA refers to changes in position and market movements.

Notes

[1]The author is Head of Policy, Dvara Research.

[2]https://www.justice.gov/atr/herfindahl-hirschman-index, retrieved on April 21, 2016. Also see Horizontal Merger Guidelines 2010 issued by the US Department of Justice and the Federal Trade Commission

[3]RBI Report on Trend and Progress of Banking in India 2014-15

[4]Are Indian Banks systemically mispricing risk? Harsh Vardhan, January 2, 2015, ajayshahblog.blogspot.in

[5]Chapter 4 from A Hundred Small Steps: Report of the Committee on Financial Sector Reforms, Government of India, 2009

[6]These calculations use data from Table No.2: Liabilities and Assets of Scheduled Commercial Banks, Statistical Tables Relating to Banks in India, various years. Growth rate in CASA deposits is calculated as (CASA deposits for year 2 - CASA deposits for year 1)/(total deposits + total borrowings for year 1)

[7]Indradhanush Plan for Revamp of Public Sector Banks, Department of Financial Services, Ministry of Finance, August 2015

[8]Thematic Review of Risk Governance - Peer Review Report, Financial Stability Board, February 11, 2013

[9]Report on Misconduct Risk in the banking sector, European Systemic Risk Board, June 2015

[10]The ICAAP is a forward-looking risk-based process that is approved by banks' boards and submitted to the RBI annually. It sets risk tolerance levels and lays out processes for managing and monitoring risks, stress testing and scenario analysis, and links back to a strategic plan for meeting current and future needs for capital and reserve funds given the risk tolerance levels.

[11]RBI can require banks to modify or enhance risk management and internal control, reduce risk exposure to specific risk levels, achieve minimum CRAR levels above the minimum regulatory capital requirements, and so on

[12]Cost of Delivering Rural Credit in India. Anand Sahasranaman and Deepti George. Dvara Research, Notes on the Indian Financial System No. 1, 2013

[13]These calculations use data from Table No. 1.13: Outstanding Credit of Scheduled Commercial Banks According to Interest Rate Range, Basic Statistical Returns of Scheduled Commercial Banks in India, various years. For March 2005 data, Data on outstanding credit of scheduled commercial banks in these tables relate to accounts, each with credit limit of over Rs. 2 Lakh.

[14]SBI base rates stood at 9.3% since October 2015, and therefore we have used 10% as a cut-off to look for loans which have been priced below base rate

[15]Here we attempt to replicate the graph provided in 'Are Indian banks systematically mispricing risk?'. Rated bond spreads data is from the CRISIL Yearbook on the Indian Debt Market while risk premiums on loans is calculated as (interest on advances/total advances) - (Five year G-Sec yields)

[16]Interest Rate on Advances, RBI, January 19, 2015

[17]Interest Rate on Advances, RBI, December 17, 2015

[18]The CRR adjusted rate is therefore the Bid Rate (since the inter-bank rate is CRR free) and the SLR adjusted rate is the offer rate (since the Central Treasury Unit can only invest in a matched-maturity SLR security and therefore incur the negative carry before making the money available to any other lending unit). Reproduced from Fundamentals of Risk Management for Banks and Finance Companies, prepared by Dr. Nachiket Mor

[19]Rajan can't convince Indian Banks to cut rates as returns shrink, Bloomberg Business, March 16, 2015

[20]Interest Rate on Advances, RBI, December 17, 2015

[21]'Deregulation of Savings Bank Deposit Interest Rate : A Discussion Paper', RBI, 2011

[22]Payment of Interest on Savings Bank Account on Daily Product Basis, RBI, February 19, 2010

[23]HDFC Bank Investor Presentation

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[25]3rd Quarter Earnings Presentation, FY 2015-16, Axis Bank

[26]Business Correspondent Channel Cost Assessment - Presentation to DFS, Ministry of Finance by Microsave, April 2015

[27]Chapter 4.2, Pg 88, Report of the RBI Committee on Comprehensive Financial Services for Small Businesses and Low Income Households (2014). This is based on submission from Bank of Baroda to the Committee and on the findings of the Committee on Financial Inclusion, 2008, headed by C.Rangarajan (Annexure IV, page 129). The submission by Bank of Baroda concludes that rural Bank branches become cost-competitive at loans above Rs.100,000

[28]Reproduced from - Cost of Delivering Rural Credit in India. Anand Sahasranaman and Deepti George. Dvara Research, Notes on the Indian Financial System No. 1 (2013)

[29]10th Wage Agreement, Indian Banks' Association, May 25, 2015

[30]Why public sector banks are the ideal paymasters, Business Today, July 6, 2015

[31]Market information

[32]'In case of crop loans up to Rs. 300,000, for which subvention is available, banks should charge farmers the interest rates as stipulated by the Government of India. If the yield to the bank (after including subvention) is lower than the Base Rate, such lending will not be construed a violation of the Base Rate guidelines'. RBI Master Circular: Interest Rate on Advances, July 1, 2015

[33]As recommended by the Committee for Comprehensive Financial Services for Small Businesses and Low-Income Households, January 2014

[34]Chapter 4.8, Pg 120, Report of the RBI Committee on Comprehensive Financial Services for Small Businesses and Low Income Households, January 2014

[35]Indradhanush Plan for Revamp of Public Sector Banks, Department of Financial Services, Ministry of Finance, Government of India, August 14, 2015

[36]`https://www.nabard.org/English/GOI_STCCS.aspx`

[37]Annual Report of the Deposit Insurance and Crecit Guarantee Corporation, 2014-15, pg 10

[38]Pg 96, RBI Annual Report, 2014-15

[39]Report of the Committee on Fuller Capital Account Convertibility, September 2006

[40]Capacity Building in Banks and AIFIs, RBI, August 2016

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