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EDITORIAL

In the year 2016 - 17, we all have witnessed many “Black Swan” events each of which had the potential to transform the economic and financial landscape of the world.

Two events on two consecutive days changed the world. On 8th November, the Indian Prime Minister Narendra Modi announced the retirement of 86% of the legal tender in the country. While some lauded it as a bold and positive move, others termed it as a thoughtless misadventure. On the second day, Donald Trump was elected as the President of the United States against all the odds and amidst all speculations.

This issue of TAPMI Journal of Economics and Finance (TJEF) focuses on the impact of Demonetization on some of the major sectors of the Indian economy. The first article, written by the Editorial Board, makes a comprehensive analysis of the impact of demonetization on various financial institutions in India. The second article focuses on the impact on the Agricultural sector and the rural economy in general.

Another important event that happened last year, was the Asset Quality Review (AQR) conducted by the RBI with a view to clean up the NPA’s in the Indian banking sector. This led to Gross NPA’s soaring to 9.1% in September 2016 according to the RBI’s Financial Stability Report. Against this backdrop, we intend to examine the critical reasons behind this crisis and study its impact on the Indian economy.

The derivative segment in India is growing in popularity. In this issue, we have introduced another interesting topic in the form of Weather Derivatives. We analyze how this seemingly unknown financial instrument can be introduced in the Indian markets.

We hope that the readers benefit from the insights of the papers published.

Managing Editor
Durgesh Desai

Aims and Scope

1. TAPMI Journal of Economics and Finance is a peer-reviewed journal. We seek articles in the areas of Banking, Economics and Finance.
2. The main purpose of the journal is to encourage quality submissions from business students.
3. We encourage submissions from students enrolled in leading business schools in India and abroad.
4. We also encourage submissions from practitioners.
5. Our aim is to provide constructive feedback on all submissions.

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EFFECTS OF DEMONETIZATION ON THE FINANCIAL SECTORs OF INDIA

The Editorial Board of TJEF
T. A. PAI MANAGEMENT INSTITUTE, MANIPAL

Introduction

Demonetization has been the buzz word since November 8th 2016 when our Prime Minister made the historic announcement about the decision to discontinue the 500 and 1000 rupee notes. This historic decision has affected almost all the sectors. Some have benefited while others have suffered. This paper intends to analyze the effects of demonetization on the major financial institutions and the Indian economy in general.

Effects of Demonetization on Banking sector:

Since the advent of asset quality review (AQR), there has been a rise in the number of NPAs. To get an idea, the GNPA of banks is 6 lakh crore as of June, 2016 which is 8.2% of the total loans[1]. These are only the NPAs as there are an equal number of restructured loans which might transform to NPAs in future.

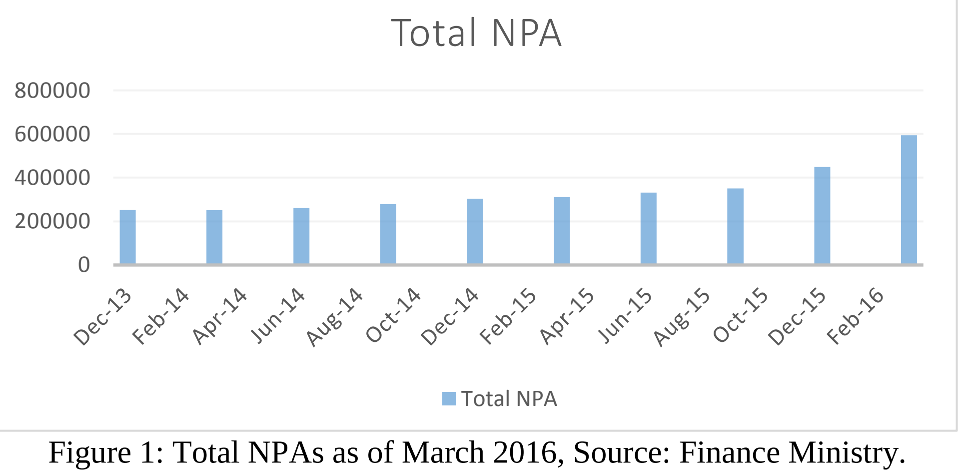

Figure 1: Total NPAs as of March 2016, Source: Finance Ministry.

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A recent data provided by the Finance ministry, which has been depicted in Figure 1, shows that 5.3 lakh crore of the 6 lakh crore NPAs are under the public sector banks. It's clearly visible that there has been a rise in the NPAs from October 2015. This can be attributed to the ever greening of loans which led to the creation of a distorted picture of the banks. Though the asset quality review led to the identification of such NPAs which were previously classified as standard, the problem of NPAs existed since the 2008 financial crisis but remained hidden due to the above mentioned reason.

The data provided by the Finance ministry also had the top 10 sectors with highest NPAs which has been shown in Figure 2.

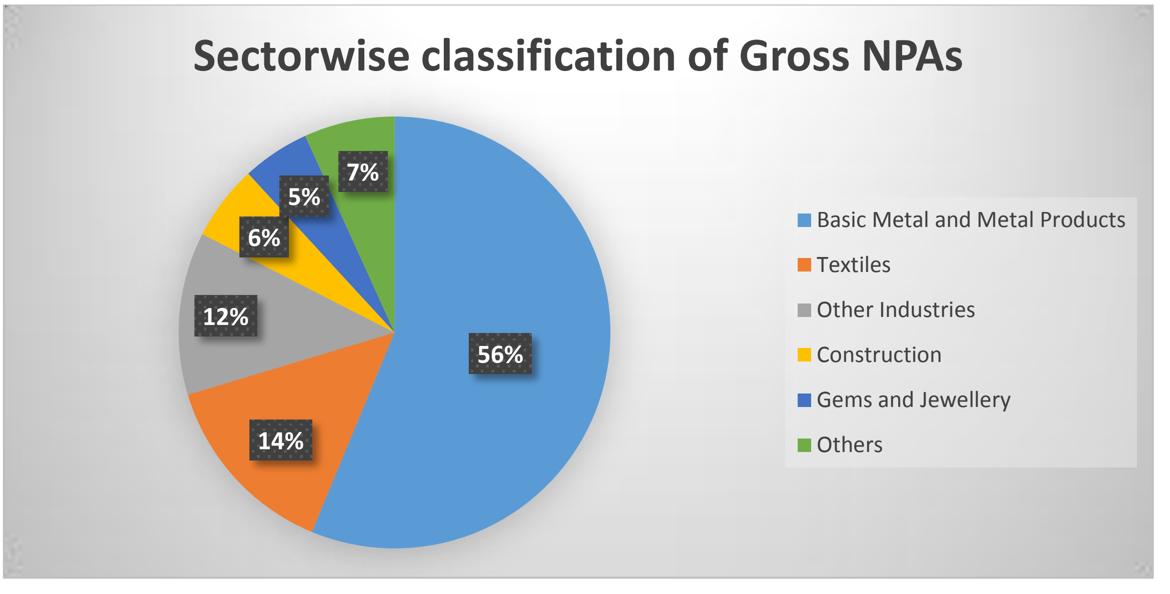

Figure 2: Top 10 sectors having highest NPAs, Source: Finance Ministry.

It's clearly visible that the Basic Metal and Metal products sector has more than 50 % of the NPAs. Demonetization has affected the industrial production significantly. The recent industrial production data for October 2016 shows us that the industrial production went down by 1.8 % for October 2016 YoY. This was before demonetization. The November 2016 IIP data shows that industrial production increased to 5.7% YoY while in December, the value reduced to -0.4%. But again, this is a YoY data. To compare the effects of demonetization, one has to compare the actual IIP of the current month with the previous month. The actual data shows that the IIP has fallen from 178.1 in October 2016 to 175.8 in November, 2016 but increased to 183.5 in December, 2016 which can be seen in Figure 4. This is an interesting phenomenon because the IIP was expected to deteriorate further. But in contrast, the IIP MoM data increased. It can also be observed that the YoY data has decreased by -0.4% which means that even though the IIP has increased compared to the previous month, compared to last year's December data, IIP has fared badly. So the increase in IIP MoM data can be attributed to a seasonal trend and that the overall outlook still looks edgy.

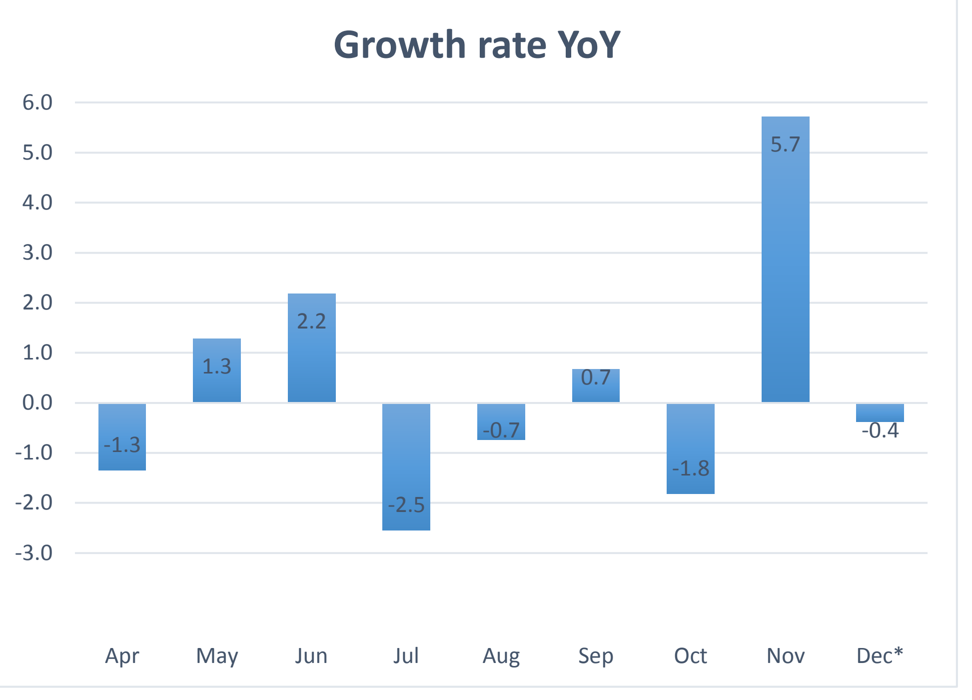

Figure 3: Industrial production data (YoY), Source: CSO

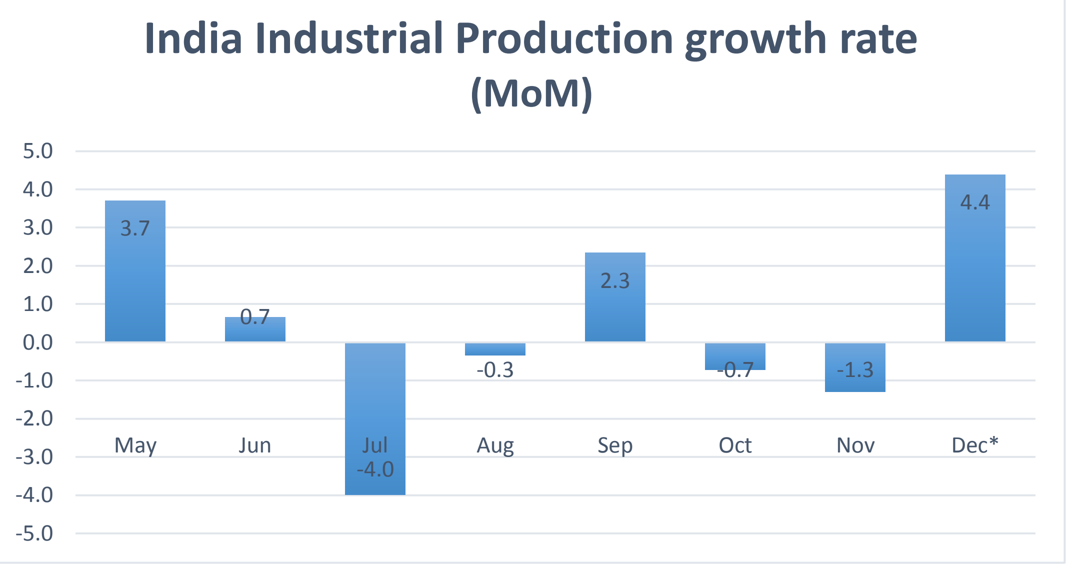

Figure 4: Industrial production data (MoM), Source: CSO

The decrease in the IIP can be attributed to the decrease in demand in many sectors which consumes metals. One such sector is the Automobiles. Post demonetization period has been a challenging one for the Auto industry as the demand for all types of vehicles has taken a dive. A recent data released by SIAM (Society of Indian Automobile Manufacturers) indicates that the total sales of cars, two wheelers, and commercial vehicles shrank by 18% in December 2016. Such a dive was last witnessed during December 2000. But the segment that was hit the most was the two-wheeler segment where there was a drop in sales by 22.5%. This can be attributed due to the fact that more than half of the motorcycle sales happen in the rural market where cash transactions are typically high. Post demonetization, the dearth in availability of cash led to reduced/conservative spending in the rural areas and this led to the fall in sales in the motorcycle segment. This trend might continue until the situation normalizes with RBI printing enough notes to satiate the demand of the economy.

The industrial sector includes manufacturing, mining, and utilities of which manufacturing accounts for 75.5 % of the total output. As mentioned earlier, it's the manufacturing sector which relies on the metal industry for raw materials. And since there is a clear decline in the manufacturing sector due to the reduced demand post demonetization, the metal industry too will take a hit and their production would fall affecting their revenues. And since more than 50% of the NPAs are from the metal industry, the banks might face a challenging situation wherein the NPAs might worsen unless the RBI is able to stimulate the demand in the economy by printing more notes.

Due to demonetization, the banks received a total of Rs. 12.4 trillion rupees. Due to this, it was expected that the banks would lend more at lower interest rates. But again, as mentioned above, when the demand in the system is low, the probability of these industries borrowing from the banks is quite low. A recent report by the famous credit rating agency, Moody's Investors service, suggested that there would be an increase in deposits by 1 to 2 percent post demonetization which would happen after the initial inflows and sharp outflows of deposits until the situation stabilizes within a span of 3 months which would lead to lower lending rates. But these effects may be negated if sufficient liquidity does not return to the system.

Another positive effect of demonetization on banks is the increase in the number of card transactions. Though there has been a surge in the number of e-wallets, the banking sector still dominates the retail payment segment. Post demonetization period has witnessed a rise in the number of card transactions. ICICI has reported a 100% increase in debit card transactions and 40% increase in credit card transactions. SBI reported a 35% increase in card transactions. Overall, all banks observed a similar trend of increase in the number of card transactions with the data heavily skewed in the favor of debit cards. Another interesting observation was that the rise in the number of requests for PoS (Point of Sale) terminals. Large banks like HDFC, Axis bank, and ICICI have reported huge growth in the number of such requests post demonetization. According to the above three banks, most new requests were from new categories of merchants like beauty salons, the self-employed segment such as doctors, CAs, vegetable vendors etc. This is a positive impact for both the government as well as banks for two reasons. Firstly, merchants, who previously preferred cash, now opting for PoS terminal helps in realizing government's objective of a cashless economy, which would, in turn, increase the tax base and help in faster fiscal consolidation. Secondly, banks will be able to realize a bigger bottom-line due to this entire exercise as the RBI is not inclined to cut the MDR (Merchant Discount Rate or in general known as the card transaction fees) as is the wish of the central government in order to promote the idea of cashless economy.

Overall, the demonetization move can help the banking sector make huge gains if the government and the RBI treads carefully by implementing policies to stimulate growth in other sectors of the economy and increase the liquidity in the system.

Effects of Demonetization on Microfinance:

Microfinance in India

The various MFIs coming together have also constituted a self-regulatory organization called MFIN (Microfinance Institutions Network) to address grievances of microfinance clients and ensure that MFIs stick to their code of conduct.

S.No	Name of MFI	Gross Loan Portfolio (₹ in crore)
1	Bandhan	9524
2	SKS	4155
3	Janalakshmi	3774
4	SKDRDP	3570
5	Ujjivan	3274
6	Spandana	2665
7	Equitas	2144
8	Satin Creditcare	2141
9	Share Microfin	1603
10	Grameen Koota	1447

Figure 5: Top MFIs as per Loan portfolio-2015 (IND)

Microcredit (small loans) is the most common product offering. In India, most microfinance loans have amounts not exceeding Rs.1,00,000. These loans are usually availed from two MFIs at most by rural households whose annual aggregate income does not exceed Rs.1,00,000 with a provision of daily loan repayment.

Growth in MFI sector

A CRISIL Report on May 18, 2016, states that MFIs are projected to grow at 125%[11]. The gross loan portfolio stood at Rs. 57,941 Cr in Q2FY17 as compared to Rs. 31,551 Cr in Q2FY16 growing by almost 84% YoY in Q2, MFIN said. The growth in MFI sector has been depicted in the figure 6.

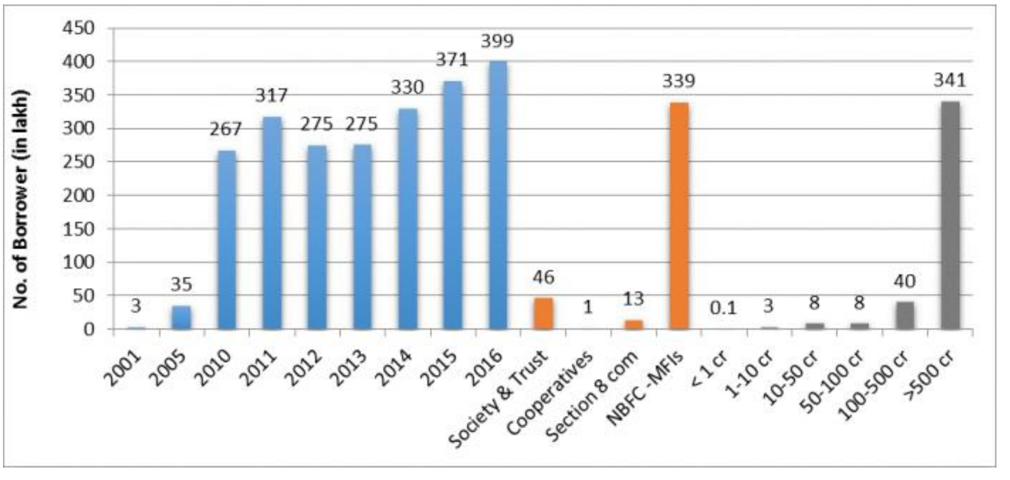

Figure 6: Growth in Microfinance Industry

Impact of Currency Ban

The currency shock is hitting the cash-driven sector at a time of high growth. The demonetization of high-value currency notes has descended down as a setback for MFIs, which have temporarily stopped providing credit to their customers at the same time taking a major hit on loan repayments, e.g. Bandhan Bank. Many MFIs had deferred the repayment schedule of their borrowers for the subsequent few days.

Usually, MFIs record a repayment rate of 99%, but it took a blow after demonetization[11]. The sector is worried about taking the business forward in view of the increasing risk of loan defaults as the repayment rate has dropped to approximately 70% around November 10th following the announcement.

The resultant liquidity crunch is likely to hurt repayment capacity of borrowers and lead to short-term delinquencies in loan accounts, as observed by India Ratings & Research because of demonetization hurting SMEs. In particular, a section of borrowers associated with the construction sector and unorganized sector self-employed individuals have been negatively impacted.

Issues faced by MFI sector

Some industrial experts felt that the notification on demonetization drive was overly concentrated on retail customers and that it lacked clarity when it came to institutional customers. The answer to above ambiguity came in the form of a press release on 21st November by RBI giving borrowers of loans of upto Rs.1 Crore, an additional 60-day ‘forbearance’ window to make loan repayments, extending the cut-off norm for NPA recognition to 150 days for loan payments due between 1st November and 31st December intended to offer respite to MFIs on loan provisioning grounds[12]. The short term deferment of NPA recognition norm will not only prevent a spike in bad and/or restructured loans due to temporary delays in collection of dues but also assist in re-building the collections system for NBFCs and MFIs.

The cash crunch has also brought out some of the irregular practices of the fast growing MFI industry. These include lack of diversification among MFI borrower profiles, surging individual size of microfinance loans, concentration of majority of the loans in few states, increased instances of multiple lending to the same set of borrowers.

It’s not the case that there were no red flags before demonetization. The rapid growth in MFI industry attracted a fair share of unregistered and unregulated lenders, said Saibal Paul, Associate Director, Sa-Dhan, a self-regulatory organization (SRO) for the microfinance sector, while adding that such players are breaking rules and tempting the people to borrow more than they can possibly repay.

Also, in the August 2015 report by Religare Capital Markets titled ‘Indian Microfinance - Crisis Brewing’, the brokerage house pointed out “multiple weak spots” in the sector. According to the RBI rules, a borrower can’t take loans from more than two lenders at a given time, subject to a total limit of one lakh rupees. However, these restrictions do not consider formal banks and informal moneylending channel. The report claimed an optimistic overlap of 25-40%.

Short term Trouble

1. Lack of sufficient liquid cash in hand for loan disbursements and fall in collections.
2. Non-payment of loans within stipulated time leading to loan defaults possibly leading to their classification as NPAs.
3. Negative implications on Credit Ratings of various MFIs and NBFCs with possible downgrading in case of some.

Long term Issues

1. Rural Economy which is majorly cash based is hit adversely as higher denomination notes are not always practical to use even if available.
2. Fight for maintaining market share under present crisis may cause weakening of credit appraisal standards by MFIs.
3. Increasing focus of Government towards Digital payments and Direct-To-Account (DTA) payments could demand a change in the collections mechanism.
4. Even if all MFIs are allowed to function as a business correspondent for banks allowing them to accept old currency notes, it would mean additional paperwork thereby adding to labour and time costs.
5. The additional 60-day forbearance window provided for deferring NPA recognition could be exploited by end consumers for intentionally deferring payments adding to the cash woes for MFIs.

Contradictory Opinion

A section of the industry has a contradicting opinion about the victim status of Microfinance industry. It opines that to certain extent, the microfinance industry is paying for its own relaxed attitude towards re-routing loan disbursements and repayments through bank accounts and assisting the formal banking system especially the Jan-Dhan scheme.

Way Forward

Paytm launched its new variant of Point of Sales (POS) service through their app on 26th November 2016 for users targeting SMEs, wholesale vendors and small store owners hit by cash crunch. The service provides an alternative to the conventional swipe POS machines found at retail outlets. This service does not have a daily transaction limit of Rs.20,000 as in case of mobile wallets and can thus complement the wallet payment systems for higher end transactions.

Country's largest bank SBI is also reaching to chaiwallahs (tea vendors), dabbawallas (tiffin service providers) and vegetable vendors to accept payments through SBI Buddy app and POS machines.

Born out of the need of providing financial services through institutions to low income clients, Microfinance industry has surely blossomed through years with its exceptionally high audience coverage, repayment rate among other achievements. Demonetization has certainly hit the cash-driven sector inversely affecting both its disbursements and loan repayments. As cash liquidity is poised to increase in days ahead, short term cash troubles would get resolved. Banking licences to large MFIs can aid financial inclusion drive. Also, taking cues from changing trends and many government initiatives towards financial inclusion, "*less-cash*" & "*cash-less*" future and digital payments, MFIs should on updating and upgrading their business model, including multi-modal business through banks, smartphone payments, e-wallets among many others by undertaking end-user financial education initiatives taking advantage of the mobile phone & smartphone penetration in rural, semi-urban and urban areas to ensure speedy recovery and sustainable growth in the now Volatile, Uncertain, Complex & Ambiguous (VUCA) BFSI world.

Effects of Demonetization on Insurance Sector

India's Insurance sector with around 52 insurance companies has a worth of 41 billion US dollars. This market share is divided between Life insurance and Non-life insurance companies. Since the opening up of this industry to private players in 2000, the Indian insurance sector has seen a rapid growth. In 2015, insurance market size was USD 75.88 billion and this market is expected to grow to USD 280 billion by 2020 considering the growth of Indian economy and the increasing disposable income. But the recent demonetization policy in India has brought insurance sector at crossroads.

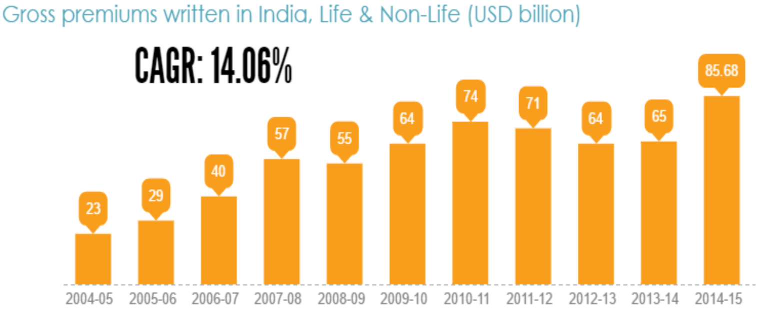

Figure 7: Ten-year growth of Insurance sector in terms of premium

In India, the primary reason for keeping cash at home has been to safeguard oneself from unforeseen medical emergencies. This is because even today most people in India prefer payments by cash and hence, hospitals, doctors, and other medical facility providers are not well equipped with digital payment facilities and likewise since hospitals are not equipped people prefer cash payments. With the implementation of demonetization, the whole chain of customers, doctors and pharmacies are severely affected. The most affected being the people with unaccounted cash who used to pay for medical treatments using lakhs of rupees. After demonetization, cashless methods of providing healthcare facilities have been a savior. In fact, health care provided by way of health insurance has come as a boon for many insurance seekers. The reason is that it is the only way to get the required treatment done without worrying about cash payments. As a result, the health insurance companies will have more buyers and there will be more people looking out for health insurance schemes offered by private and public insurance companies. Consequently, the economies of scale will bring down the cost of buying health insurance.

Experts have predicted that with more frequent replenishment requirements, the demand for insurance would go up.

Penetration of insurance in India is very less as compared to that in developed countries and an initiative like demonetization is expected to expand the insurance market. A larger number of small businesses would consider buying insurance to cover the risks as the cash transactions become restricted. Also, the income at the bottom of the pyramid (individual and business) is expected to rise, which would be a positive sign for the overall insurance industry.

Insurance companies sell insurance in bulk to other companies who buy as an insurance cover for all their employees. Insurance company executives revealed that a few such companies are demanding insurance limits as high as 500 crores per location. However, insurance industry experts have said that this is a temporary situation, till the customers do not have adequate cash. But it does increase the revenue of insurance companies in the short run.

Companies that manage cash and ATM machine functioning are covered by insurance companies. Even banks take cover for ATM machines against any theft or damage. Post-demonetization, companies that took a cover of mere 1-2 crores for such purposes are now demanding as high as 20 crores. The reason is the greater amount of cash being exchanged.

The Indian insurance sector is majorly driven by the government agencies like Life Insurance Corporation of India, Oriental Insurance Co. Ltd, New India Assurance Co. Ltd, and others. Soon after the announcement of demonetization, these companies started taking steps to manage the change. LIC for example, extended its grace period for the customers to pay their premiums of several policies without any penalty, by a period of 20 days. This allowed people to have some time in order to withdraw any necessary amount from the bank ATMs.

On a downside, the private insurance sector which mainly deals in cash is adversely affected by demonetization as it is not ready to except the premiums in terms of online banking or credit in terms of bank transfers.

With a few detrimental effects, demonetization essentially seems to be beneficial for the insurance sector due to the increase in insurance policy buyers and most importantly due to a transformation towards becoming an internet banking equipped sector.

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EFFECTS OF DEMONETIZATION ON INDIAN AGRARIAN ECONOMY

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Introduction

The currency (notes) is the most liquid legal tender issued by the RBI which can be used to extinguish a public or private debt. The Indian economy, until 8th November 2016 had an estimated □14.18 trillion worth of currency notes in circulation, making India predominantly a cash-based economy. The Indian agrarian economy which is also primarily cash based, and is highly unorganized, has emerged as a source to route black money, back into the system both in terms of tax exemptions and channelling funds to create legitimate funds [1]. According to the Central Board of Direct Taxes, only 3.81% of the total Indian population pay income taxes and it is suspected that enormous sums of money are tied up in illegal transactions that are unaccounted for. These illegal transactions not only form a parallel economy in the country but also distort the actual Indian economy. As a countermeasure, the Government of India hitherto referred to as GoI, enacted to demonetize (strip a currency of its legal status) its currency notes of 500 and 1000 denomination. These denominations accounted for 86% [2] of the total currency in circulation. This paper intends to highlight the effects of demonetization on the Indian agrarian economy.

Impact of Cash Crunch on Agriculture

Agriculture is primarily a cash based sector with large capital input. This sector contributes about 15% to the Indian GDP and employs about 49% of the total workforce. The real growth rate of the sector is reported to be 1.3% [3]. This low growth rate is usually attributed to the droughts experienced in the past two years.

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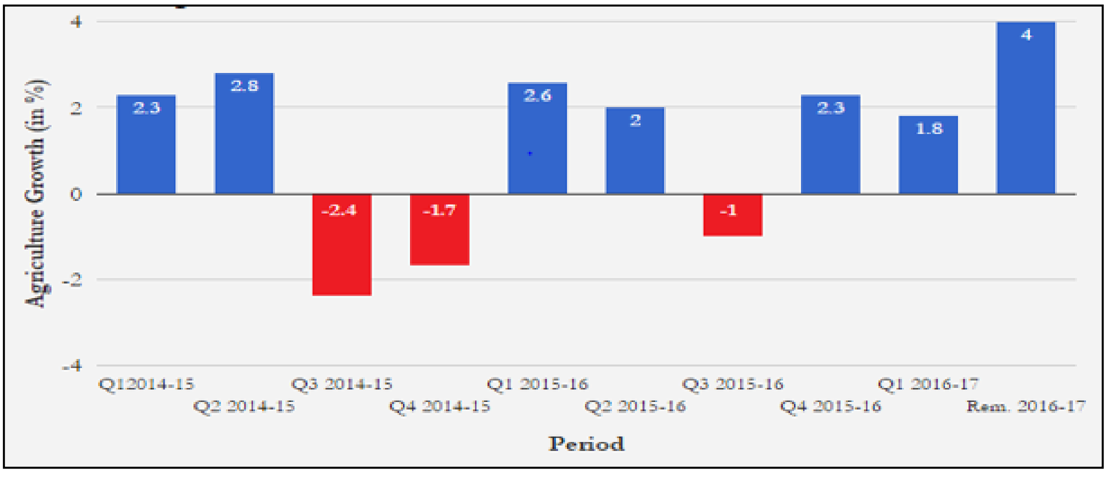

Fig. 1- Source: Key Economic Indicators, Office of the Economic Advisor
** Note: For 2016-17, the number represents prospective growth figures.*

In India, November marks the harvesting of the Kharif crop and sowing of the Rabbi crop. Rabbi crops (wheat, barley, mustard, sesame and peas) account for half of the total crop output, that is, 112 metric tons. Around 263 million of India's farmers are dependent on cash transactions for buying seeds, fertilizers, and fuel. Since rabbi seeds are usually self-pollinated, farmers need not buy seeds every year. However, they are recommended to buy new High Yield Variety (HYV) seeds for better harvest, but due to the current cash crunch, the few willing farmers may refrain from doing so. The area under cultivation, sowing pattern, productivity, and markets has directly been affected. As of November 2016, 79 lakh hectares[4] of land is under rabbi cultivation (an increase of 8.8% since the year 2015) and only 20%[4] of the sowing have been completed in crop producing states like Maharashtra, Punjab, Gujarat, Tamil Nadu and Karnataka. The move to demonetize and the subsequent cash crunch has created an inability to secure financing to the much-unorganized agriculture sector for both harvesting and sowing the subsequent crop cycle.

Perishables, vegetables and fruits, in most markets exhibited a drop in market arrival as well as a fall in prices post demonetization as much as around 4% to 5%. According to the data available on Agmarknet, daily arrivals of tomatoes in wholesale markets in December 2016 was 54 percent higher than November 2016 likewise, in Maharashtra it was 48 percent higher in the month of December than in November in 2016. Thus prices dived due to the glut in the market. Eventually, farmers are at a loss which will have a cumulative effect.

Due to the prevailing conditions, rabbi crop output may increase by 6.02% [5]. But, lower sales of quality seeds and lesser use of fertilizer can cause 1.06% [4] decline in the output.

Impact on Macro variables

Demonetization has certainly been reflected in the slashed estimates for GDP of the third quarter by the banks.

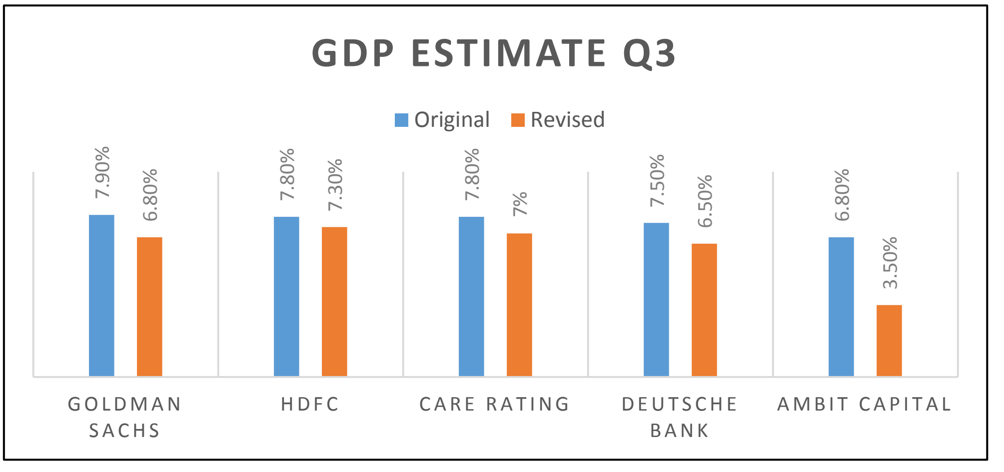

Chart 1- Source: Media Report, CARE

CRISIL, who has mapped the agrarian growth to the gross domestic product (GDP) predicted that a sub-normal monsoon, like the previous two years, shall keep the GDP around the 7.3% growth mark [2]. Demonetization is being regarded as the third year of low monsoon due to its similar effect with regard to production and consumption despite 2016 being a year of normal rainfall.

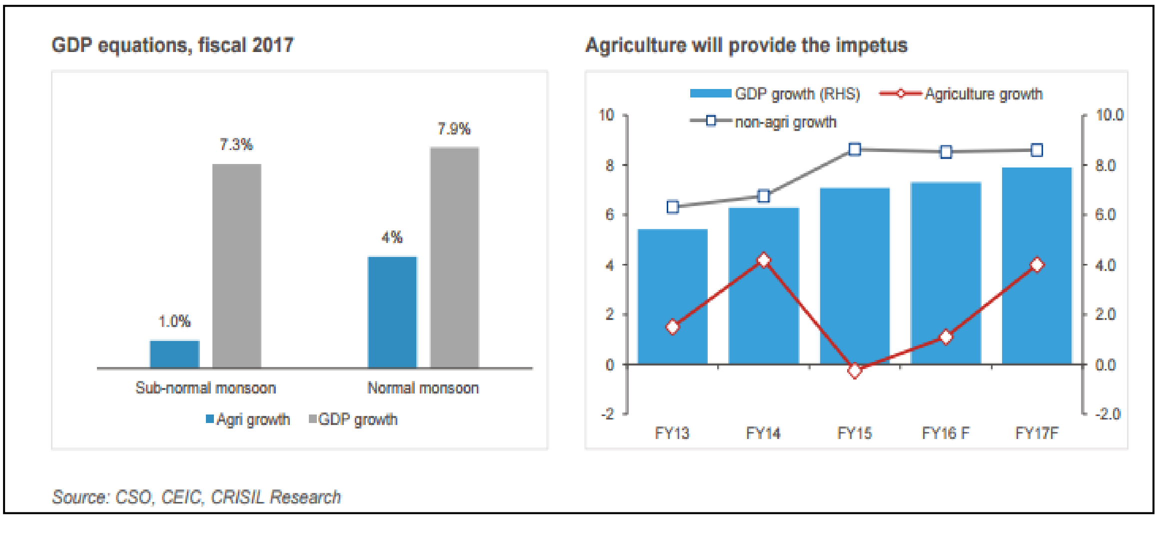

Fig 2-Source: CSO, CRISIL Research

Now, going by this co-relation, and corroborated by the report of the Planning Commission we can expect the Indian GDP to remain in the sub 7.3% range which is lower than the projected growth for 2016 of 7.6% by the International Monetary Fund. A trend analysis of the same also confirms the deviation that the Indian GDP faces.

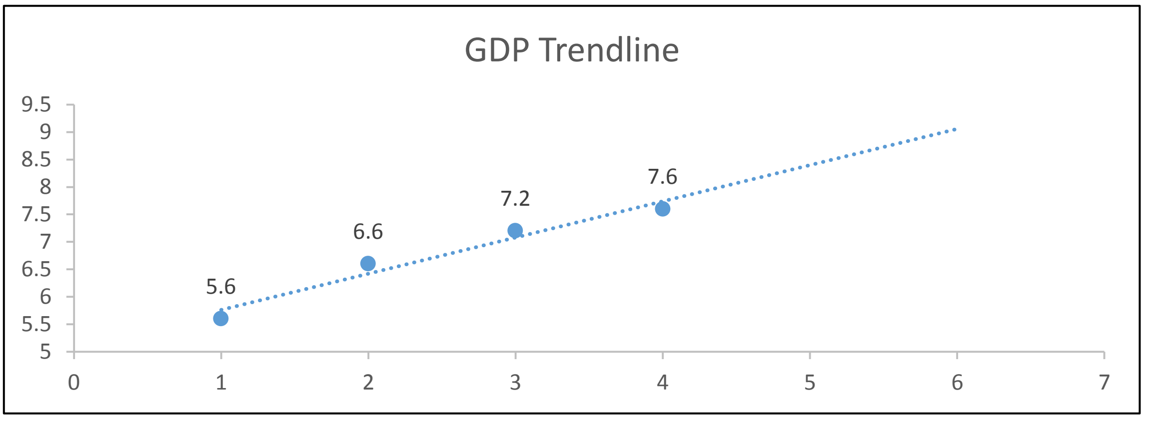

Chart 2: Projected GDP of 2016- QoQ

Agriculture amounts to about 50% of the industrial output (tractors, two-wheelers, agricultural equipment, etc.) and about 26% service sector GDP[2].The lowering of GDP by 0.3% shall affect the related manufacturing sectors as well. The Nikkei PMI Index for India dipped to 49.60 for December 2016, a sharp fall from 54.4 as recorded for October 2016. The current PMI is close to the all-time low of 48.50 in August 2013, when the economy faced record high fiscal deficit and the Indian Rupee slid to its lowest historical price at 68.85 per dollar. Predictably, this dip coincides with demonetization. To put things in perspective a 0.3% dip amounts to almost INR 5,631,001,289. [2]

This cycle can possibly take almost two to three quarters to stabilize as the GDP growth in the third quarter (September-December 2016) and the first quarter of 2017 (January-March 2017) can be significantly lower than expected. Another factor to be noted is the lower rural income in these quarters due to losses incurred.

This shall significantly reduce the consumption factor in the GDP function-

$$GDP = \boldsymbol{C} + I + G + NX$$

Continuing with the food supply shock, the lowered agricultural production shall promote imports and cause a trade deficit in the BOP account. The increased imports shall depreciate the Indian Rupee further than the current Rs.68.31 per dollar. Note again that this already is close to the all-time low of 68.85 per dollar. This can mean increased cost of other imports too. The major Indian imports include crude petroleum, gold, coal briquettes, diamonds and petroleum gas among other things. Crude petroleum, coal, etc. are the prime drivers for almost every industry. An increased cost for these shall put an upward push on the Producer Price Index (PMI) which will eventually trickle down to the Consumer Price Index (CPI).

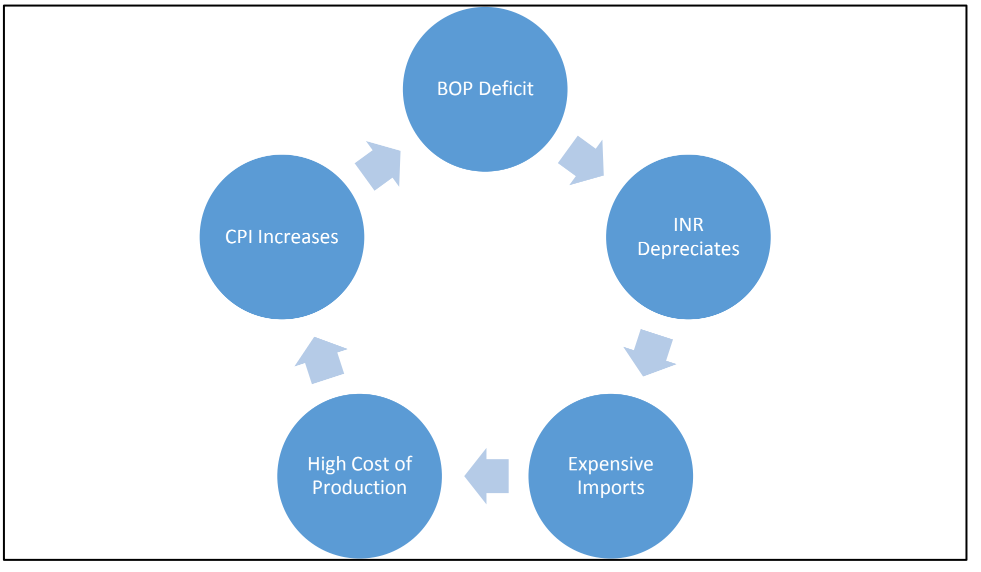

Fig 3: Effects of food supply shock

However, due to lowered personal discretionary consumption following the cash crunch, it can be expected that the inflation will not get out of hand initially. However, it is the **authors'** opinion that around October 2017 the CPI shall be on the higher side of 5.05% [6] partially owing to the aforementioned reasons of trickle down inflation.

Government Measures

The government of India took many measures to ease the woes of the farmers. Firstly, the limit for withdrawal was set up to Rs.25, 000 per week against crop loans sanctioned and credited to their accounts subjected to loan limits. As an extended relief, the government allowed the farmers to use the old Rs.500 notes for purchasing seeds from any state or central government outlets as well as any agriculture studies institute. However, as only 20% [3] of the farmers hold PAN Card, it may be difficult for them to exchange the currency.

The rural bank NABARD has announced to disburse $3.07 billion through cooperative banks so as to help the farmers sow winter crops. Also, 250 local wholesale markets in 10 states have already adopted Electronic National Agricultural Market (eNAM) [8] platform to sell the produce by accepting cheque payment.

Impact on Overall Rural Economy

Though agriculture forms a major part of the rural and national economy, it's not the only contributor. Demonetization also affected the allied agricultural industries like tractor manufacturers, farm equipment manufacturers, etc. along with the overall village economy. The cash crunch and lower penetration of electronic payment services in the rural sector has significantly reduced the buying power of the rural consumer at least in a short-medium run. This has compressed the demand for sectors ranging from transportation, consumer durables, to perishable items like fruits and vegetables [7]. Since there is a contraction in demand a fall in prices can be expected, however, if the supply is too compressed in the subsequent quarters due to lack of production in the 3rd quarter, there is a possibility of a hike in prices.

The other recourse is that of a line of credit in the current scenario. People may start trading on credit basis in hopes of realizing the cash flow when the liquidity situation improves. This shall lead to a spike in prices as the interest on the credit will be realized through the end consumers. In any case, a price spiking trend cannot be ruled out as discussed.

Impact of Budget 2017

The budget looks to lower the pain caused by demonetization to incomes and spending in the predominantly cash driven rural sector. The farm sector and its allied non-farm sector has been allocated a credit of Rs.10 trillion, which has made way for spending on soil testing, contract farming, MNREGA, setting up of dairy-processing, and selling and distribution of produce, interest subsidy, irrigation, and crop insurance with 26.5% of all farmers covered as of December 2016. The budget proposes to increase the coverage of eNAM to 585 wholesale markets from the current 250 with an assistance of Rs 7.5 million for each eNAM.

Conclusion

Demonetization, though a noble and sudden change in monetary policy with a lot of shock value, from an agrarian viewpoint seems like a counter-intuitive move as it will cause inflation and lowered overall rural GDP in the coming year. The depreciation of the Indian rupee will further add to the woes of the Indian consumer while adding to the balance of payments account deficit.

It is our opinion that involving NABARD and other rural co-operative banks in the demonetization drive, so as to exchange the outdated notes quickly could have prevented the sudden cash crunch in the agrarian economy. Further, the Electronic National Agricultural Market (eNAM) [8] platform can be advanced so as to involve online payment modes as well, that is, link it through Unified Payments Interface (UPI).

The steps taken by the GoI like the seven crores Kisan Credit Cards issued for insurance can be linked for direct benefits transfers for quality seeds. For this to be achieved efficiently, electronic payment points should be available at a walking distance and users should find apps easy to use preferably, in their local language. Once the agricultural value chain implements electronic payments to align itself with the financial supply chain in the country, benefits will definitely follow. Capital aids from private ventures and banks will power agricultural growth, and socially improve rural lives. This along with a better monsoon as witnessed in 2016 could go a long way in ensuring lower food prices and thereby decrease in inflation. The aim to revive fortunes in the agricultural economy and the rural infrastructure seems to be the primary motivation of the Union Budget announcements this time, as evinced in higher allocations for MNREGA and PMAY. Increase in credit availability, the focus on micro-irrigation and dairy-related activity will bolster rural incomes and support consumption demand. The allied industries to agriculture like the makers of consumer goods and durables, two-wheelers and tractors would also get the much-needed push and this will surely add to the overall GDP of the country. [9]

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RISING NPAS IN INDIAN BANKING SECTOR: CAUSES, EFFECTS, IMPLICATIONS AND REMEDIES

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Introduction

The economic progress of a nation and development of its banking sector is invariably interrelated. The banking sector is an indispensable financial service sector supporting development plans through channelizing funds for productive purpose, intermediating flow of funds from surplus to deficit units and supporting financial and economic policies of the government. Banks serve social objectives through priority sector lending, mass branch networks and employment generation. Maintaining asset quality and profitability are critical for banks survival and growth. In the process of achieving such objectives, a major roadblock to banking sector is prevalence of Non-Performing Assets (NPA). In India, the problem of bad debts was not taken seriously until it was mandated by the Narasimham and Verma committee. The committee mandated the curbing of the particular issue because NPA direct towards credit risk that bank faces and its efficiency in allocating resources.

The aim of this research paper is to study the current trend of NPAs in Indian scheduled banks (up to 2013-14 only). The paper further examines the critical reasons behind the rise of this issue, its impact on Indian banking sector and Indian economy. In order to understand the criticality of the problem an effort has been made to study what impact NPAs have on ease of doing business rankings. Furthermore, the paper concludes with some of the important measures which if implemented then can improve the current scenario of NPAs in SCBs.

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NPAs in Indian scheduled commercial banks

In order to analyze the core issue, we need to study the data related to it. Figure 1 showcases gross NPAs and Net NPAs during the period of 2001-02 to 2013-14. The data shows that Gross NPAs increased from Rs. 708.61 billion in 2001-02 to Rs.2642 billion in 2013-14. Similarly, Net NPAs also increased from Rs.355.54 billion in 2001-02 to Rs.1426.57 billion in 2013-14. The figure also showcases the trend of how NPAs have moved over the years. The NPAs declined till 2006-07 but from 2006-07 there is an upward rise in NPAs. As in 2016, the PSBs accounts for gross NPAs of around Rs.3.06 lakh crores which is more than the size of the budget of Uttar Pradesh.

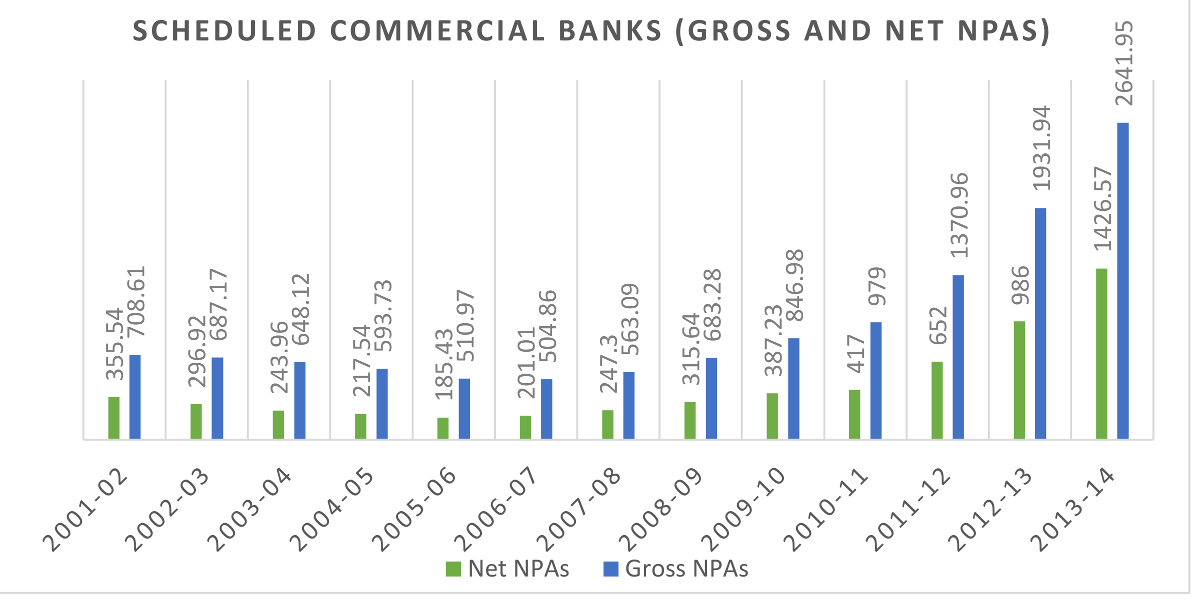

Figure 1: Gross and Net NPAs of Scheduled Commercial Banks

Causes

On a global scenario, there can be numerous reasons for rising NPAs such as global slowdown, economic crisis, fall in domestic demand etc. However, pertaining to the Indian banking sector, there are certain other issues that cater to the rise of NPAs. These issues are:

- Wilful defaulters, fraud, mismanagement and misappropriation of funds.
- Lack of proper pre-appraisal and follow up.
- Under financing
- Delay in completing the project.
- Business failures
- Deficiencies on the part of bank viz., in credit appraisal, monitoring and follow ups.

Apart from above stated points, three main issues that are contributing heavily to the rise of NPAs of banks, are as follow:

Lending to the priority sectors

The concept of priority sector officially came into picture in 1972, after the National Credit Council emphasized that there should be a larger involvement of the commercial banks in the priority sector. In 1974, the banks were given a target of 33.33% as share of the priority sector in the total bank credit. Later this rate was revised to 40%. RBI has divided the priority sector into categories like agriculture, small scale industries, small businesses, state sponsored organizations for SC/ST, education loan, housing loan, consumption loan, micro credit, loans to software industry, food and agro processing sector, venture capital and export credit.

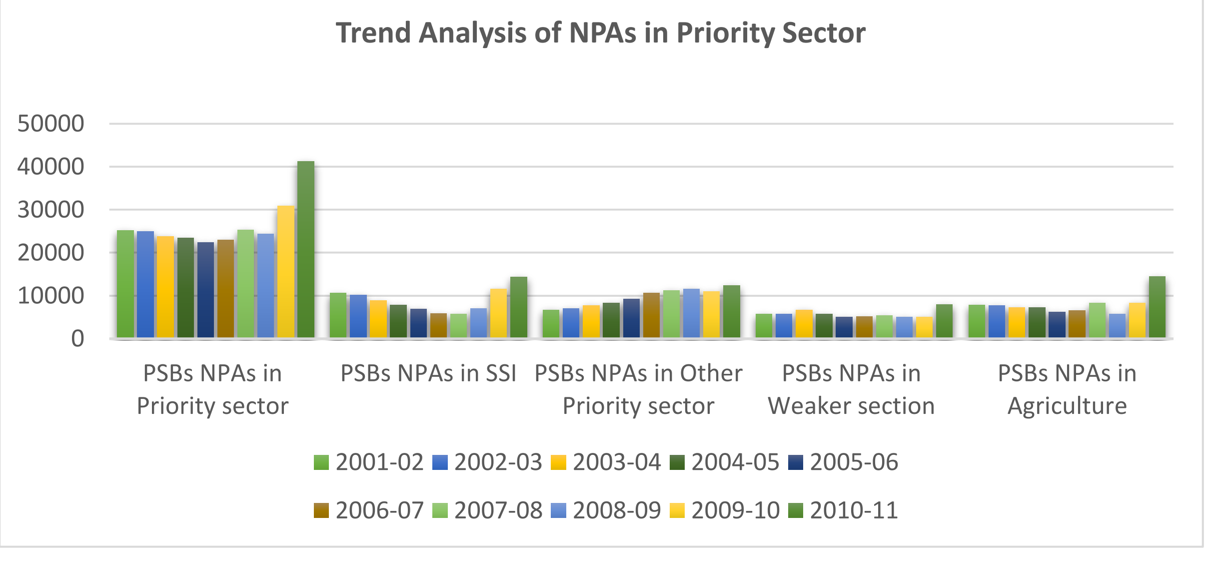

Figure 2: Trend Analysis of NPAs in Priority Sector

From the above chart, we can easily analyze that PSBs have been giving advances to priority sector with an annual growth in every successive years. There exists a general opinion that banks have more NPAs from advances made to priority sector, as the borrowers don't have sufficient means to repay the loans. Public Sector Bank's NPA's in the priority sector have shown a slow decreasing trend from 2001-02 to 2005-06. From 2006-07 onwards the trend is not constant but mostly it shows an upward trend till 2010-11. The PSB's witnessed an alarming increase in their share of NPA's during the period 2009-10 and 2010-11. It can also be observed that the NPA's rose by Rs. 16105.66 crores in the last 10 years.

Lacklustre recovery of loans by banks

Presently, Lok Adalats, DRT and SARFAESI are the common methods sought for credit recovery. We will try to analyze the recovery process and various channels through their statistics.

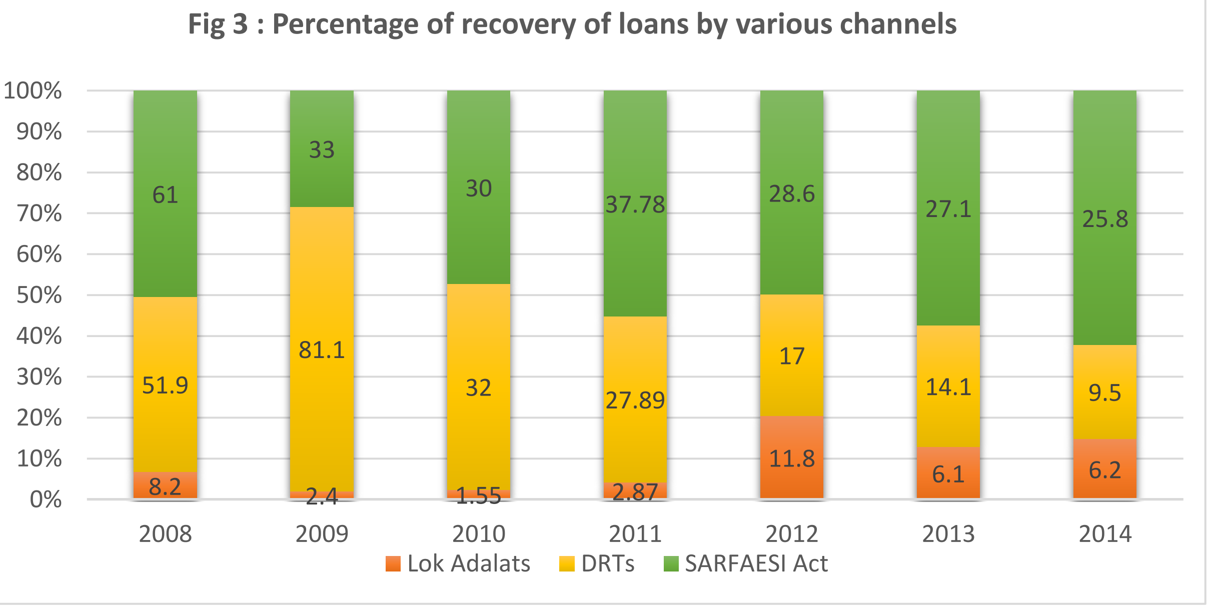

Figure 3: Percentage of Recovery of Loans by Various Channels

The SARFAESI Act even though being the best mode of recovery, still provides the recovery of only 25% of the total loan amount. The number of cases referred in all the channels and the amount recovered increased successively every year but the percentage of the amount recovered to the total amount still remains very low. Thus, it shows that though recovery channels were contributing in recovering the NPA's but that was still not enough.

Restructured portfolio

Global economic slowdown has affected all the countries and India is no exception to that. Various Indian sectors like agriculture, manufacturing, service etc. have been facing slowdown. The following data showcases the net NPA's held by various Indian sectors as on 31st March, 2013.

No.	Sector	Percent
1	Agriculture	4.7
2	Construction	4.0
3	Cement	2.7
4	Infrastructure	1.5
5	Iron & Steel	4.0
6	Engineering	3.7
7	Automobile	1.8

Source: Financial Stability Report, June 2013

Table 1: Sectoral NPAs as on 31st March, 2013

In order to aid these sectors, Indian banks have been restructuring the advances provided through measures like interest rate reduction, extension of repayments etc., so as to bring back them to the normal state. A major part of restructuring involves corporate debt restructuring. The following data showcases the amount of restructuring done by banks in recent years:

Table 2: Restructured advances of all SCBs (Rs. In Lakh crores)

Year	Amount	% Restructured standard advances to Gross advances
2009	0.75	2.73
2010	1.36	4.23
2011	1.38	3.45
2012	2.18	4.68
2013	3.58	5.70

Source: Economic Times & Financial Stability Report June 2013

The increasing restructured advances majorly affects bank's profitability and capital adequacy, further leading to the rise in NPAs.

Comparison with the world economies

In order to better understand the loan recovery system of India we shall compare our economy with the world economy on the basis of World Bank's data. According to the data, India ranks 183rd among 196 countries in terms of loan recovery time and 149th in terms of loan recovery percentage. India's poor loan recovery process affects its ease of doing business rankings also. As per World Bank's data, India ranks 136th in ease of resolving insolvencies and 130th in ease of doing business 2017.

Table 3: Ease of Business doing rankings (and other parameters) of BRICS nations

Economy	Ease of business doing rankings 2016	Ease of Resolving insolvencies	Recovery rate (%)	Time (years)	Cost (% of estate)	Strength of insolvency framework index (0-16)
South Africa	74	50	35.1	2	18	12.5
Brazil	123	67	15.8	4	12	13
China	78	53	36.9	1.7	22	11.5
India	130	136	26	4.3	9	6
Russian Federation	40	51	38.6	2	9	11.5

Source: www.doingbusiness.org

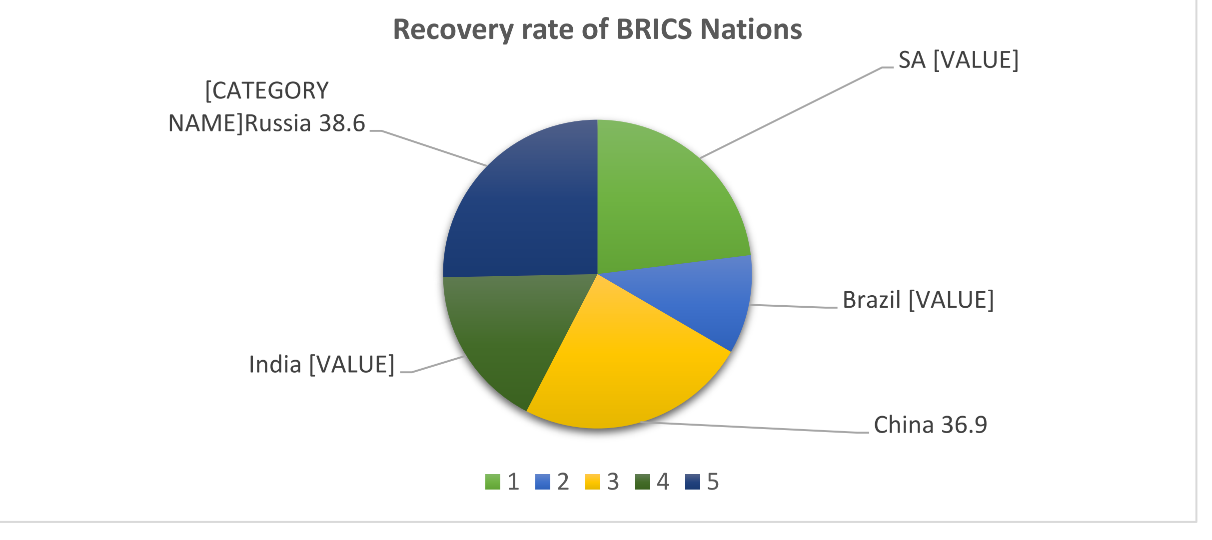

Figure 4: Recovery rate of BRICS Nations

Table 3 and Figure 4 showcases the comparison of India with other BRICS nation in terms of recovery rate of loans provided and the ease of doing business rankings. India ranks the lowest among all the BRICS nations in ease of doing business as well as in ease of resolving insolvencies. The recovery rate of India, which is 26%, is lower than other nations, except for Brazil. India lags behind other BRICS nations in terms of time to recover credit, which is 4.3 years, and the strength of insolvency index, which is 6.

Figure 5 showcases the comparison of recovery time and rate between the top five countries (of insolvency resolving index), G7 member nations and BRICS countries. Further analysis of the World Bank's data reveals that India takes 7 times more amount of time in recovery of loans as against Japan. The amount which is recovered is less than 1/3rd the amount recovered by Japan.

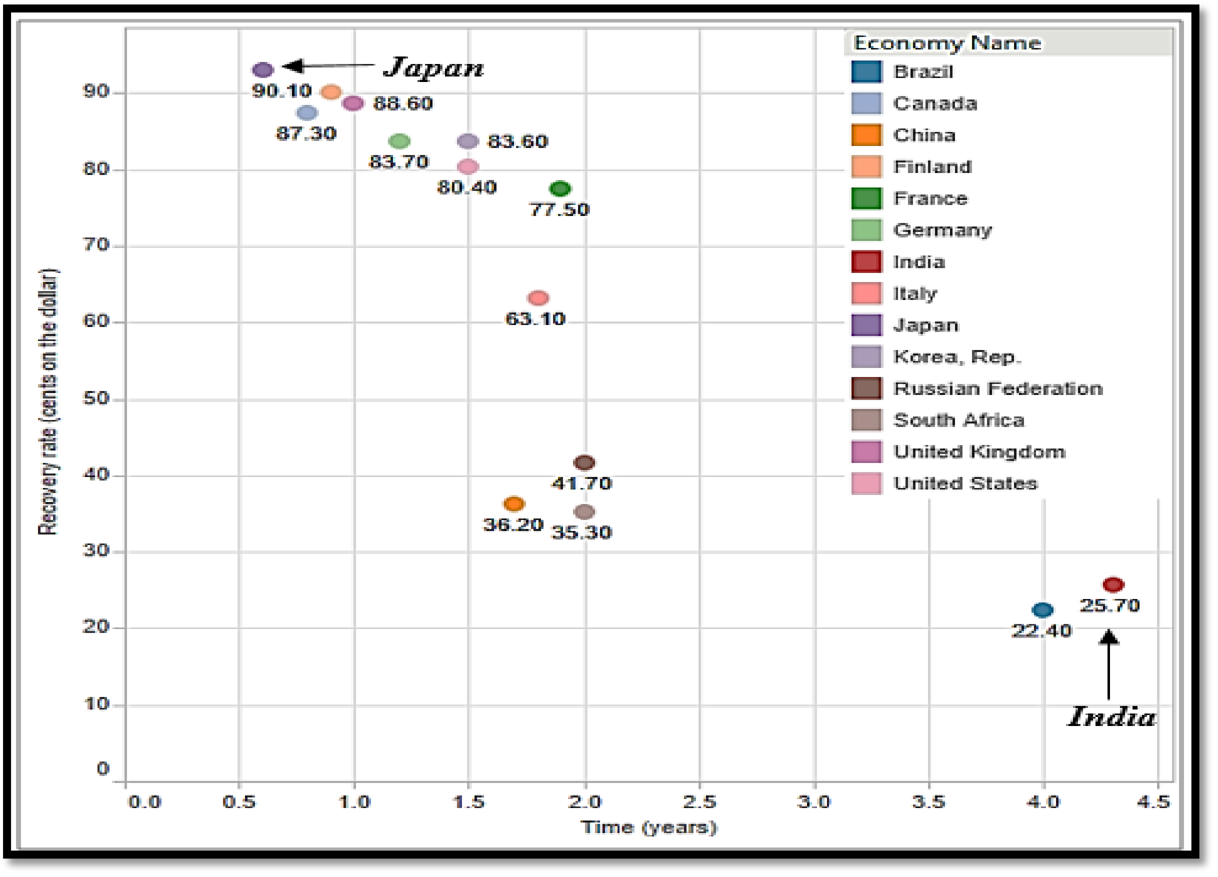

Figure 5: Comparison of recovery time and recovery rate

Source: www.doingbusiness.org

This data clearly reflects the poor loan recovery process of India and asks for some corrective and immediate actions like strong Bankruptcy law so as to reduce the time taken for completing the insolvency process.

Impact of NPAs on banking sector and Indian economy

In today's era of globalization, the role of banking sector is not limited to providing financial resources to the needy sectors but the banks act as agents of financial intermediation and also plays a major role in the fulfilment of social agendas of the Government. However, a steady rise in the NPA's of banks affects not only the banking sector but the country's economy as a whole.

Firstly, NPAs leads to asset contraction for banks. Due to the presence of NPAs, the banks follow low interest policy on deposits and high interest policy on advances provided. Thus, this act puts a pressure on recycling of funds and further creates a problem in getting new buyers. Secondly, as per the Basel norms all banks are required to maintain capital on risk weighted assets. A rise in NPAs pressurizes the banks to increase their capital base further. Lastly, rise in NPAs reduces the customer's confidence on the banks. Rise in the NPAs affects the profitability of the bank which further hinders the returns to be received by the customers. Decrease in profits leads to a lower dividend pay-out by the banks and affects the ROI expectations of the customers. Thus, a rise in NPAs not only affects the performance of the banks but also affects the economy as a whole.

Remedies/Measures for managing NPAs

Banks today have a herculean task of both effectively managing the NPA's as well as keeping their profitability intact. In order to achieve this, the banks need a well-established credit monitoring system. Since, lending forms a major segment of bank's transactions thus they need to properly evaluate the credit proposals they receive. Full information related to the client/company, industry, management etc. should be collected. A centralized model for sanctioning and recovery of loans should be setup. Staff with specialized skills in credit risk management must be hired. Timely watch on the performance of the borrowers must be kept so that recovery of instalments becomes easy. In conclusion, proper monitoring system and effective business models need to be developed in order to resolve the gigantic problem of NPAs.

Conclusion

NPAs have not been a problem only for the banks but has been a problem for the economy too. The money locked up in NPAs has a direct impact on profitability of the banks as many Indian banks are highly dependent on interest income. Though many steps have been taken by RBI and the government to reduce NPAs but they are not enough to curb it. The government needs to speed up the recovery process of loans and also need to reduce the mandatory lending to priority sector as it is one of the major contributor to bank's NPAs.

Also, right fiscal and monetary policies along with RBI’s strict supervision is needed to eradicate this disease from its root.

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WEATHER DERIVATIVES - CONCEPT, CHALLENGES, AND FEASIBILITY

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Introduction

A weather derivative is a tool for managing weather risk. It is a financial contract that allows a firm to hedge itself against unexpected and adverse weather. A weather derivative contract or WD derives its value from future weather conditions. Contrary to stereotypical weather insurance, the payout of this kind of derivative is based on a parametric weather index. For instance, the index could be centimeters or millimeters of rainfall. The index could also be a cumulative frequency distribution of temperatures across many locations. The underlying of WD could also be related to snowfall or hurricanes.

Origin of Weather Derivatives

The weather derivative market as compared to other financial instruments is relatively young. The first transaction in the WD market dates back to 1997. The sector developed due to the severe repercussions of El Niño. These events were forecasted correctly by the meteorological community. Firms that had their revenues linked to weather realized the importance of protecting themselves against seasonal weather risks. Many companies who were in the business of dealing with financial futures and options saw WDs as attractive tools to hedge weather risks.

The insurance sector achieved substantial financial consolidation. As a result, there was significant capital to hedge weather risks. Insurance firms started writing options with payoffs linked to weather events. This, in turn, elevated the liquidity for the development of a WD market. Thus, the WD market evolved over the years into a strong over-the-counter market.

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In September 1999, the Chicago Mercantile Exchange (CME) introduced exchange-traded and temperature-related weather options and futures. This was done primarily for two reasons:

- To increase the market size of WDs.
- To eliminate the counter-party credit risk involved in OTC weather contracts.

These contracts provided avenues for investors to manage their weather risks using standardized contracts at the best available prices.

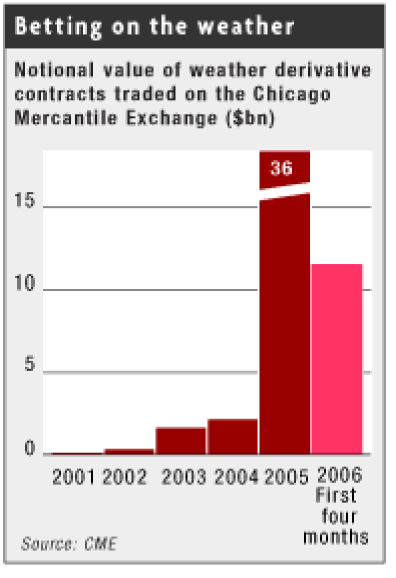

Figure 1: Value of the Contracts trades on CME (in $ billions)

Hedging Weather Risk: Concept of HDDs & CDDs

A company going in for a weather deal has a plethora of choices. Energy companies mostly opt for Heating Degree Day option for dealing with winter temperature risk or Cooling Degree Day option for dealing with summer temperature risk.

Calculation of HDD and CDD Indices

- **HDD Index:** It measures the cold waves during winter months. HDD index is calculated by subtracting the mean of the daily high and low temperatures from 65°*F* (in the US) or 18°*C*. Higher the value of the index, colder the day. Payout is calculated as below:
    1. 0, (when actual temperature is greater than the base temperature)

2. Base temperature - Actual temperature, (when actual temperature is less than the base temperature)

$$\text{Daily HDD} = \max\left[0, 65^o - \frac{(T_{\max} + T_{\min})}{2}\right]$$

- **CDD Index:** It measures the warmth during summer months. CDD index is calculated by subtracting 18°C from the mean of daily high and low-temperature readings. Higher the value of the index, warmer the day. The payout is calculated as below:
    1. 0, (when actual temperature is less than the base temperature)
    2. Actual temperature - Base temperature (when actual temperature is greater than the base temperature)

$$\text{Daily CDD} = \max\left[0, \frac{(T_{\max} + T_{\min})}{2} - 65^o\right]$$

Since there cannot be a heating degree and cooling degree both on the same day, the obtained HDD and CDD values are accumulated over months or seasons. On the basis of these monthly cumulative HDDs or CDDs weather options are written. HDD and CDD values are never negative.

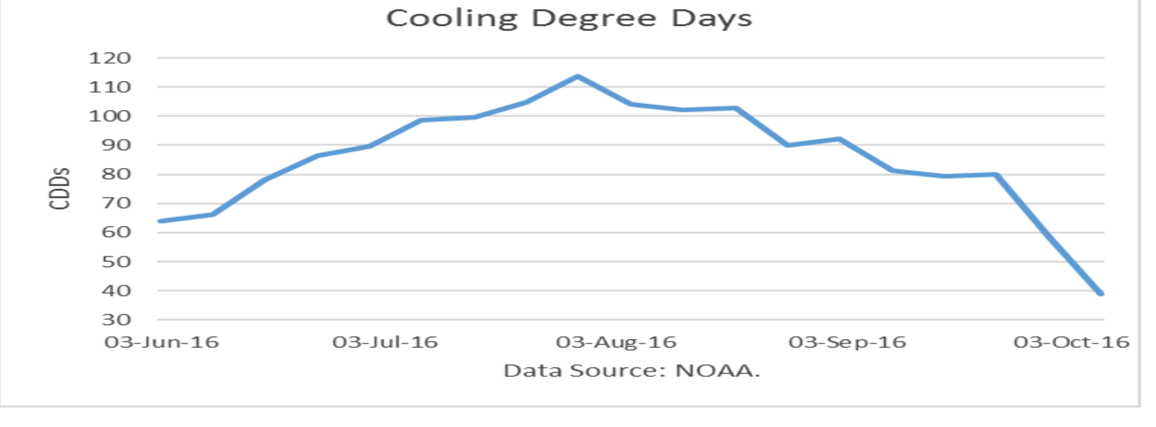

Figure 2: Values of CDDs over Jun-Oct

An amalgam of both indices is required to cover the extremes of winter and summer. A firm that expects a very cold day would sell off HDDs. If winter actually turns out to be warmer, it can again buy HDDs at a lower price earning profits. Thus, the profit earned is the difference between the selling and purchasing price of the HDDs. This profit will offset the loss due to lower revenues in case of unexpected weather. Similarly, a firm can buy CDDs expecting the night to be cold. If this weather condition prevails, then the company makes profits. If it does not happen then the firm can exercise a call option and gain on later transactions which will again offset the loss in revenues.

Valuation of HDD and CDD Indices

For example, on a winter day, the maximum and minimum temperatures were 40°F and 26°F respectively. Hence, the mean temperature would be 33°F. Therefore, HDD would be 32°F (65°F-33°F). Similarly, on a summer day, the maximum and minimum temperatures were 90°F and 80°F respectively. Hence, the mean temperature would be 85°F. Therefore, CDD would be 20°F (85°F-65°F).

Assuming the accumulation of degree days, for an entire month of June the daily mean temperature was a 60°F for the first week. For the entire week, a total of 35 HDDs (5 HDD x 7) will accumulate.

During the second week of the month, it turns out to be warmer with daily mean temperatures of 71°F. For the entire week, a total of 42 CDDs (6 CDD x 7) will accumulate.

Assuming, that HDD or CDD index is valued at $20. Hence, for an HDD index of 35, the value of the HDD futures will be $700 (35 HDDs X $20). Similarly, for a CDD index of 42, the value of the CDD futures will be $840 (42 CDDs X $20).

Scenario of Weather Derivatives in India

India ranks as the second largest producer of farm output globally. With over 50% of its rural workforce and a GVA (gross value added to GDP) of 17.4% in 2014, agriculture plays a significant role in the Indian economy. Weather phenomenon like shortage of rainfall can lead to huge losses to farmers. This calls for a risk management tool for the farmers to shield them from losses occurring due to seasonal weather changes.

Traditionally, India had crop insurance which indemnified farmers against the shortfall in crop yield. This required the insurance companies to perform a field analysis of any claims of yield loss. Huge premiums along with the cumbersome process of collecting proof of damage made crop insurance less attractive.

Weather Based Crop Insurance Scheme (WBCIS) was first introduced to the Indian farmers in 2003. It aims to indemnify farmers for anticipated losses due to adverse changes in weather parameters like rainfall, temperature, frost, et al. WBCIS uses weather-based parameters as a proxy for crop yields and the payout is done based on these parameters. It is the first forage for India's agriculture insurance to area approach rather than an individual approach. Reference Weather Stations (RWS) have been set up and weather parameters are monitored in these areas on a daily basis. Any deviation of actual weather from the trigger weather leads to a proportionate insurance pay-out automatically.

WBCIS is mainly targeted towards the agriculture sector with differing premiums for different crops, weather derivatives are a generalized instrument to hedge against the impact of adverse weather conditions.

In 2016, SEBI had decided to allow trading of weather derivatives in the financial market. This road is blockaded by a plethora of challenges. Some of the major challenges are listed below:

- **Pricing of Weather Derivatives:** The immediate challenge in front of the SEBI panel is to tackle the issues of pricing of such derivatives. Unlike other financial derivatives, weather derivatives don't have a definite pricing model. The primary reason for this is that a monetary value cannot be assigned to the underlying. As the underlying could be rainfall or the sunshine, it cannot be bought or sold. Pricing relies heavily on the accuracy of data collected to calculate the indices. Thus, forecasting becomes important. It forms the backbone of WDs. Therefore, an understanding of the environmental factors and statistical weather data becomes important. WDs have a longer maturity as compared to the forecasting data which results in problems associated with curve fitting (normal or lognormal). Thus, option pricing models like the Black-Scholes, 1973 are not applicable in this context. Implementation of a simple option pricing model is more relevant and is shown below:

- **Simple Option Pricing:** In this model, a probability distribution is made to fit a set of monthly HDDs or CDDs and is then combined with the payout of the option. Expected Payout (of a CDD option) is given by:

$$E = M \int_{CDD=0}^{\infty} P(CDD)Q(CDD)d(CDD)$$

where, P(CDD) is the probability distribution of CDDs,
Q(CDD) is the payout of CDD option in units,
M is the amount (dollars) per CDD,
d(CDD) is the differential

The value of E depends on the strike price, the probability distribution of CDDs, and the number of dollars per CDD.

- **Deciding the Pricing Index:** The parameter (rainfall or temperature) that the index captures should be accurately measurable and should have a strong correlation with the production variable (crop yield in case of agriculture). In India, rainfall can be used as a parameter for a weather index since it is the main determinant of crop yield.

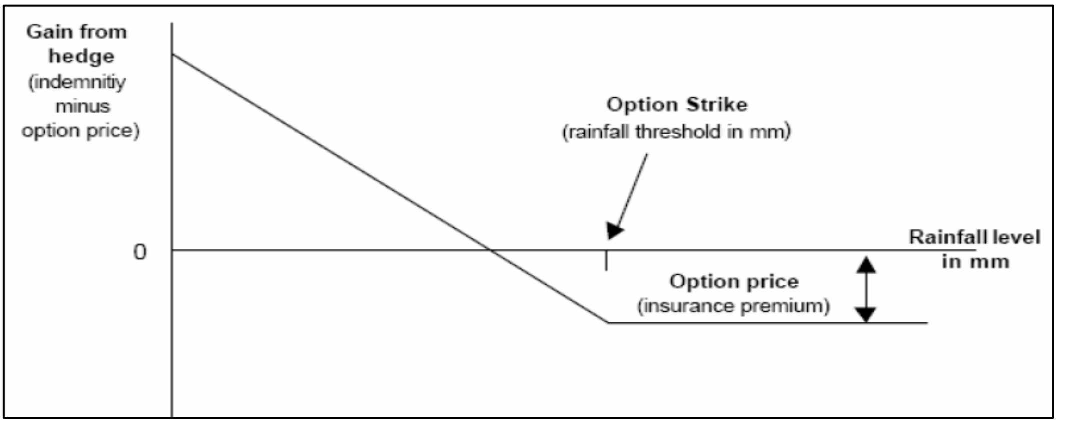

Figure 3: Payout Scheme for a Put Option (Underlying is Rainfall)

In a simple put option, the cost of the derivative is the option price for the producer. A striking point is decided which is the minimum rainfall threshold below which the owner of the put option earns an indemnity.

A rainfall index $\mathbf{R_t}$ for a given year can be determined by calculating the weighted average effective rainfall.

$$R_t = \sum_{i=1}^{m} w_i\, r_{it}$$

$$r_i = \max\,[r_i^*,\ CAP_i]$$

Where, r_{it} is effective rainfall in period **i** for year **t**

r_i^* is actual rainfall in period **i**

CAP_i is the additional rainfall not contributing to increased crop yield

Payout is triggered when the index price R_t, falls below a threshold level of rainfall denoted by T. T is generally decided by taking weather forecasts into consideration.

$$\text{Indemnity} = \begin{bmatrix} 0 & \text{if } R_t \geq T \\ \frac{T - R_t}{T} & \text{if } R_t < T \end{bmatrix} \text{ X Liability}$$

- **Infrastructure Issues:** Another major challenge is related to infrastructure. The spread of WDs in India would be largely determined by the availability and reliability of weather data. Computerized mini-weather kiosks at the village level, categorized as public goods, will be required to be setup. These kiosks can provide real-time weather data. Indian Government can divert the funds from subsidies and crop insurance schemes towards providing weather kiosk infrastructure and involving private organizations to develop innovative WDs. The exchanges, brokers, and consumers are all significant parts of the infrastructure required for trading in WDs.

- **Basis Risk:** It is a risk that occurs in a hedging strategy in which offsetting investments doesn’t experience price alterations in completely opposite directions from one other. This negative correlation between the two investments creates the opportunity for excess gains or losses in a hedging strategy, thus adding risk to the position. Hence, for WDs, it arises when weather in one city is not exactly equal to weather used to value the futures or options. In the WDs market, basis risk is huge and agricultural risk managers must be aware of this risk, being inherent in these markets. Basis can be traded in OTC market after writing a contract on the difference in the CDDs or HDDs between two cities.

- **Willingness to Pay:** Willingness-to-pay for WDs is calculated as approximately 8.8% of the maximum payout of the WD contract. This metric is derived from a framework that provides an estimate of the 'willingness to pay' for hedging the weather uncertainties. The concept involved is that of expected utility. For a farmer growing a crop, his expected utility can be expressed as:

$$E(U) = E(S) - C - R$$

Where, E (U) is the expected utility,

E(S) is the expected sale price,

C is the cost of inputs and R is a risk premium.

The utility is maximized with respect to planned production.

The understanding of the subtle traits of WDs, adequate training and knowledge needs to be imparted to market participants like farmers, consumers and financial institutions, etc.

Role of Regulations

Forward Market Commission (FMC) and SEBI have to work closely to permit derivative trading on underlying assets like weather indices, etc. In the current scenario, SEBI regulates derivative and cash market on exchanges of all financial securities (i.e. stocks and bonds) while FMC regulates commodity futures and forwards. The priority is to enforce strong regulations to facilitate the introduction of weather derivatives. The Forward Contract (Regulation) Act, encompasses forward trading (derivative) in tangible goods. The ambit of the act needs to be widened in order to allow trading on intangibles like weather, electricity, freight etc.

Following are the key points on the basis of which SEBI will deliberate before introducing WDs in India:

1. Investor Protection:

Below are the four approaches to ensure investor protection:

- The trading rules should ensure that trading is conducted in a fair and transparent manner.

- Safeguarding clients' money is critical. Securities deposited by clients with the trading members should be kept in a separate clients' account.
- It should be ensured that trading by dealers on their own account is totally segregated from that for clients.
- Market integrity: The trading system should ensure that the market's integrity is safeguarded by minimizing the possibility of defaults.

2. **Quality of markets**: Quality of markets goes beyond market integrity and aims at enhancing important market qualities, such as cost-efficiency, price-continuity, and price-discovery. This is a much broader objective than market integrity.
3. **Innovation**: As the concept of WDs is relatively new, enforcing regulations should be done with utmost care. This will ensure that innovation which is the beacon of economic growth doesn’t get stifled.

Conclusion

India is one of the most successful developing countries in term of a vibrant market for exchange traded derivatives. In developed countries, WDs are being used by sectors other than agriculture to hedge systemic risk caused by minor weather fluctuations. In India, the government is in continuous pursuit to insulate farmers from financial shock occurring due to crop failures. Hence, the feasibility of introducing weather derivatives is relevant. By investing in weather stations with sophisticated equipment, large coverage across the country, efficient index structuring and creating awareness among the farmers the success of weather derivatives can be assured. The Forward Contract (Regulation) Act needs to be amended which can enable SEBI to introduce and coordinate the new and innovative hedging products like weather derivatives. These financial instruments can cater to the risk appetite of farmers to hedge risk.

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