Amity Journal of Insurance Banking and Actuarial Science

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From the Desk of Editor

It gives me an immense pleasure to release the Volume 1 Second Issue (July – December 2018) of Amity Journal of Insurance Banking and Actuarial Science. (AJIBAS). The Journal has since received the registration approval code UPENG/2018/74978 from Registrar of Newspaper of India (RNI) as well as ISSN Number 2581-6373 from ISSN Office.

The Insurance Industry, in the recent past, has witnessed phenomenal growth, drastic changes in regulatory framework, increasingly higher expectations of the consumers in terms of quality of service, usefulness of products, customization of product and choice of products etc. As technology innovation, higher customer expectations and disruptive new entrants redefine the marketplace, insurers remain focused on growing top-line sales, bottom-line profitability, addressing challenges, and competing in a highly dynamic industry. Standing in the way of insurers achieving these objectives is a wide range of challenges. But many of them are not within their control, such as increasing cut throat completion on pricing front, increasing magnitude and frequency of catastrophe losses etc. But how effectively insurers anticipate, prepare and adapt to their shifting circumstances, both strategically and operationally, are well within their control, and can help differentiate them from others in the market

The Banking sector in India is at a ground-breaking cusp, where traditional state-owned players are facing significant technology disruptions, while digital growth aided by newer technologies is changing consumer mind-sets. While problem stressed loans are a key challenge facing the sector, the Government is taking aggressive steps to shift the banking ecosystem to a higher plateau through promising developments in the Indian political, socio-economic, and regulatory landscape amid the government's efforts to heavily leverage the digital push into the financial services domain. Moreover, the banking ecosystem has now access to differentiated consumer data collection sources, not only resulting in a rapid rise of Fintech players but also aiding incumbent banks in making faster banking decisions.

This issue of AJIBAS consist of six articles on the recent developments in Banking and Insurance Industry like. Artificial Intelligence In Insurance Industry, 3D`S – Impact of Disruptions, Demonization, Digitalization - Shaping Up New India, Conditional Volatility in Exchange Rate: Empirical Evidence from India; Blockchain - Driving Innovation, Scope of Rural Insurance In India and Emergenceof India as a Global Reinsurance Hub. I hope the readers will enjoy reading these articles while learning the new concepts and procedures being followed by the corporate houses in achieving customer satisfaction and business enhancement.

We would like to express our gratitude to Honorable Founder President Dr. Ashok K Chauhan for his constant motivation and inspiration. We are grateful to our respectable Chancellor Dr. Atul Chauhan for his continuous guidance. Our sincere thanks to Vice Chancellor Prof (Dr) Balvinder Shukla for continuous guidance and motivating in publication of compendium of papers.

Editor

A. P. Singh

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Artificial Intelligence in Insurance Industry

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This paper focuses on how artificial intelligence changes the way the companies do insurance business. This article consists of how artificial intelligence redefines the existing processes that helps the industry to adopt best practices to drive operational efficiency. With the help of foreign practices and the usability of artificial intelligence in Indian context is shown to have an idea where we are moving into and what will be the future of smarter technologies that give new experiences to the insurance companies and customers. This paper also reflects how the insurance companies adopt artificial intelligence in claims to analyze the frequency of frauds and how robotic process automation will empower the humans to take the crucial decision with the help of robotics and deep learning analytics.

Keywords: -Artificial intelligence, insurance, health care, RPA, technology, claims.

Introduction

Artificial intelligence (AI) is one of the important megatrends rise from the extensive digitization prospect of the economy. As of now these "smart" AI technologies have mainly grab the attention in the E- commerce business, automotive, and the consumer goods industry. Siri, the automated voice that is trending on Apple's iPhone, or Alexa, Amazon's electronic shopping assistant, are two examples which are shaping public perception in a new dimension. Automated image recognition systems and self driving cars are making our future more engaging and innovative. The private sector has long known the potential built-in in the new technologies which provides a unique advantage. Self-learning software as well as cognitive systems can either already is found throughout the value chain or are on the final position of deployment: forecasting and pricing tools for purchasing behavior and inventory management, chatbots for customer service, delivery drones for the last mile. Artificial intelligence applications can help companies to optimize services as well as drive the operational efficiency that helps in accelerate processes, and make better decisions in terms of business. Akin kind development is taking place in the healthcare sector. The most efficient progress to date has also been made with AI use cases around providers.Medical centers are largely using early detection systems supported by algorithms or automated recognition of patterns in patient health data.

There are less known open doors that the utilization of keen innovation empowers health insurers in India. Introductory utilize cases have been discovered that AI-upheld frameworks that improve mind – for example, in the advancement of modified offers for patients experiencing and torment incessant disarranges or for recognizing clinical pathways that neglect to hold fast to rules. However artificial intelligence is prepared to do more than we break down. Psychological frameworks that are utilized can help caseworkers to proficiently comprehension of screen cases, assess them with more noteworthy exactness and care and settle on educated choices. Doctor's facility claims the administration is another zone that stands to profit with artificial intelligence.

Fig-1 Uses of artificial intelligence in insurance

How Smarter Technologies are Transforming the Insurance Industry

Artificial intelligence (AI), which makes machines to perform and in context with human intelligence is coming when insurance and other industries are particularly facing a widespread digital disruption. Competition is powerful. More than half of listed Fortune 500 companies have gone out of business since 2000 because of cutthroat competition And AI is set to take this disruption to a new exciting level. Although AI technologies are still evolving and many uses are yet to be explored, they already have the capability to enable tangible, real-world business outcomes models Across all industries, they're being used to deal with a wide range of challenges by making interactions with machines and systems to built more smarter and simpler. Insurance companies too are entering the intelligence age to simplify their process for a long run. And they're doing so while already under acute pressure on multiple fronts to built strategies for the same. Whether its intelligent automation replacing repetitive manual tasks in the business, workers reinforces with enhanced judgment, improved interactions with customers for a better experiences, or the development of intelligent products as per the trends, the technology will drive growth, profitability and sustainability across all segments for insurers that grasp the opportunity at presents and also for the future. New artificial intelligence technologies will lead insurance companies to redefine how they work and how it changed the way we run insurance business, how they create innovative products and services as per the requirement, and how they deliver customer experiences which are exciting.

Redifining Existing Processes

AI will allow insurers to redefine existing processes, create innovative products and transform customer experiences. Insurers must adopt a people strategy that adapts, up skills and augments the human workforce. They must evolve how they work, from simple RPA towards AI-powered intelligent decisions. They must unlock trapped value in new and existing datasets, by allowing AI to leverage data in creative ways across the entire value chain. Applied intelligence takes this a step further. We use the term to describe the application of intelligent technology and human ingenuity at the core of business across every function and process to address an organization's most complex challenges, break into new markets or generate entirely fresh revenue streams.

The insurance companies that benefit most from AI will be those that are prepared to reanalyze their approach to their people and workforce with their processes and their data. Dramatic advances in AI are taking place just as insurers are facing huge pressures. Competition is heating up, new entrants are disrupting existing business models, and technology is advancing at an exponential rate. Consumers' expectations of their insurers are growing, spurred by rapid technological advances in other industries. As a result, insurers must find new ways to improve operational efficiency, drive product innovation and transform customer and employee experiences. Why can't a customer track the progress of their insurance claim in the same way they track their Amazon delivery or their Uber driver

Adoption of Al in Insurance Claims Transformation

Processing claims is one of the critical and time consuming functions for any Insurance Company in the world. Reducing cost of claims by improving operational efficiency, better loss ratios and enhancing customer experience are some of the key drivers of claims optimization. Many Insurance Tech companies are now-a-days changing the way claims processes are managed. Customer-centric smart solutions from claims intake to final payments are helping insurers improve their productivity, cut loss adjustment expenses, reduce overall TAT for claims settlement, thus improving customer satisfaction.

Claims cost nearly about 80% of the premium. By increasing the claims processing efficiency, insurer can reduce their loss adjustment expenses which are associated with it, and significantly improve customer satisfaction that built trust. 1% reduction in claims cost will have a significant impact on overall cost savings. Hence, an integrated solution is needed to optimally manage claims operational cost and drives the customer experience. The solution must overcome the challenges of manual processing, multipoint and improper processes, fraudulent claims, and lack of amalgamation with core systems, to improve productivity.

Digital disruption is fuelled by the adoption of artificial intelligence, particularly in insurance claims management. AI can enable insurers to use rich historical data and algorithms to improve future predictions. With the help of machine learning and deep learning, AI gains ability to learn from past experiences, detect patterns, relationships, anomalies, which help AI to take informed decisions like a human. With an advantage of visualizing and advance interaction capability, AI is helping insurers to enrich customer experience to the core. Thus, insurance carriers can greatly benefit from the recent advances in artificial intelligence and machine learning. A lot of approaches have proven to be successful in solving problems of great interest such as pricing, claim handling, and fraud detection among others.

Claims operations can be improved using AI in various ways. There are around 2000 start-ups focusing on Artificial Intelligence as core focus area. It is interesting to see AI implementations in the Insurance Industry, where predictive powers of AI is all set to replace key roles in the insurance value chain such as actuaries, surveyors, adjusters to reduce the labor costs as well as obtain more authentic predictions. On the other way, driverless cars are a treat to auto insurance premiums. Insurance claims processing is also undergoing transformation in a complete value chain from FNOL to Final claim settlement.
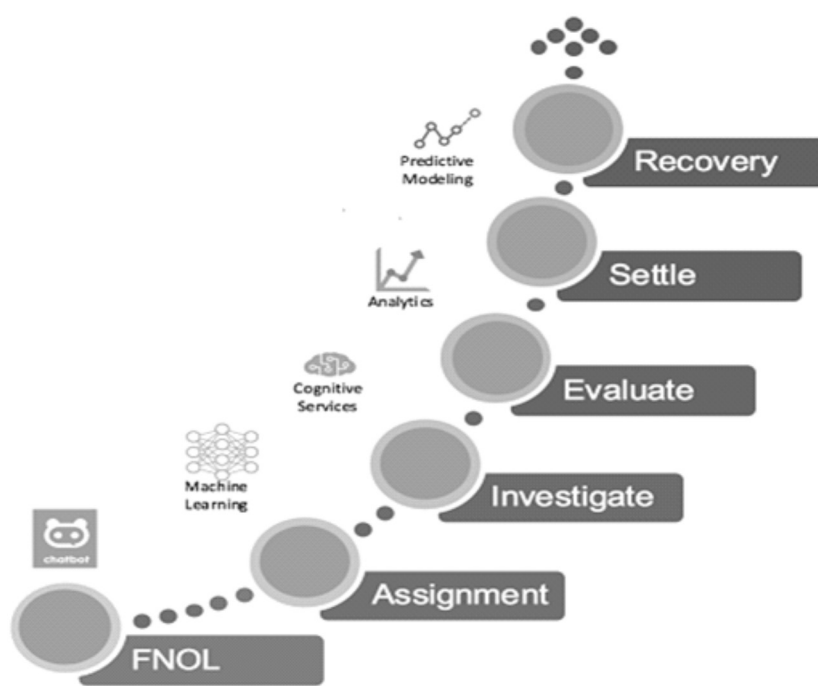
Fig 2- FNOL value chain

AI technology adoption will help insurers improve customer experience by implementing AI bots to have seamless interactions to accept claims (FNOL), and inquire about existing claims and answering FAQs. This will improve customer experience and reduce workload on call center/customer executives.

Startup's Adopting Al for Streamline Process

- Lemonade is a licensed insurance company who is dealing with superior offering insurance to renters and homeowners entirely through a chatbot app for smart phones that takes only about 90 seconds to get insured and about 3 minutes for claims to be paid.

  - Machine learning and Deep learning will help claims triage (Assignment) accurately to the most suitable adjuster, which will help improve TAT and reduce expenses of reassignment.

  - Machine Vision and Image Recognition will help implement self-service claims inspection by the claimant. It will reduce adjuster visits to repair workshops.

- Germany-based Motions cloud offers a mobile solution for the claims handling process, including evidence collection and storage in various data formats, customer interaction and automatic cost estimation.

  - Early detection of fraud using deep learning and predictive analytics will help insurer fight fraud with more ancillary and improve investigation process.

- Premonition is US-based Company, which offers an Artificial Intelligence system that mines Big Data to find out which Attorneys win before which Judges. This helps insurance companies to assign litigation claims to the right attorney and increase probability of winning.

- Paris startup Shift Technology developed an AI-powered cyber security solution to detect fraud at entry stage for the insurance industry using advanced big data and machine learning algorithms.

- California-based startup Captricity has developed machine learning algorithms that can excerpt and transform data from handwritten and typed forms at a +99.9% accuracy. This reduces data entry efforts and help text analytics.

- Tractable is a London-based artificial intelligence corporation that promotes its ability to streamline automobile, property damage repair payments by comparing uploaded photographs and repair estimates, reducing the cycle time from days and weeks to minutes, without involving a human claims handler.

- UK-based startup RightIndem looks to put the injured party in charge of the entire claims process for motor vehicle collisions by inviting customers to make and process claims at "their pace", using their smart phone, tablet, or personal computer..

- Zürich Insurance announced that it deployed artificial intelligence to evaluate personal injury claims after testing showed claims processing could take years' worth of information, and reduce it to a single decision in a matter of seconds. Insurance companies in Japan and Great Britain have begun doing the same, replacing staff members with sophisticated computer algorithms to perform the work previously done by humans.

The one constant among all of these companies is the promise to reduce claims "leakage," a term used to describe the dollars lost through claims management "inefficiencies" that raise costs and lower profits for insurance companies.

HEALTH AI MARKET SIZE 2014-2021

Acquisitions of AI startups are rapidly increasing while the health AI market is set to register an explosive CAGR of 40% through 2021

$600M $6.6B

11x

2014   2021
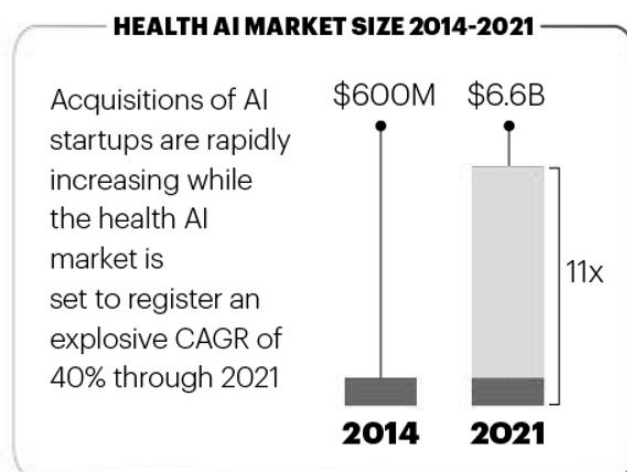
Fig 3- Health AI market

Human Versus Machines

AI is about 'humans augmented by machines' many insurers are already investing heavily in technologies like deep learning, video analytics and natural language processing. Exciting as the technology is, insurers won't be able to unlock the full potential of AI unless they can successfully support their existing human workforces in adapting to AI. That includes fostering the right corporate culture and skills base. Insurers need to develop strategies that deal with adapting, up skilling and augmenting their existing workers. Retraining will be essential as virtual customer service agents and chatbots automate routine tasks, freeing human representatives to focus on higher-value activities. Functions like underwriting and pricing will also increasingly rely on machine learning algorithms rather than human experience and judgment.

Employees must understand that technology is a powerful enabler and not a threat to their livelihoods. AI will create new jobs—perhaps even entirely new categories of jobs—for the human workforce. For example, insurers will almost certainly need more people working in control and governance functions because virtual workers and algorithms will require some human supervision. In fact, 68 percent of insurance CXOs forecast that intelligent technologies will result in a net gain in jobs at their companies in the next three years, according to Accenture research.

Insurers that make extensive use of AI technologies will need humans (data scientists, AI developers and others) with the skills to build, use and maintain them. That means attracting some of the best digital talent into what is perceived to be a slow-moving, traditional industry. Accenture's Technology Vision for Insurance 2017 found a third of insurers citing 'a lack of expertise in using these technologies' as a barrier to adopting AI. To respond to changing business needs in an agile manner, insurers will also need to complement their own human and virtual employees with external resources.

 New technologies will oblige insurers to forge new partnerships, with AI vendors and insurtech start-ups, for instance. And to do so, they may need to fundamentally redesign their approach to outsourcing. Insurers will need to implement responsible and ethical AI practices to ensure trust and transparency, especially given the sensitivity of the data they have access to. That means developing strict guidelines for the use of AI, as well as fully auditable and regulatory compliant processes. 68 percent of insurance CXOs forecast that intelligent technologies will result in a net gain in jobs at their companies in the next three years. 6 of insurance CXOs expect the total share of roles requiring association with AI to increase in the next three years of insurance CXOs believe human-machine collaboration is important to achieve their strategic priorities.

Artificial Intelligence with Robotic Process Automation

Insurance companies assume AI to completely transform the way they run insurance businesses in the next three years intelligent automation should not simply be about automating existing human processes, along with their flaws. It should be about fundamentally redefining these processes— maybe even the business model— to achieve the best outcomes. Insurers have laid solid foundations with robotic process automation (RPA)—creating rules-based virtual workforces with the ability to scale. Now they need to build on those foundations with intelligent automation virtual workforces that can determine and adapt to the needs of the business. That means complementing RPA with newer AI technologies and evolving from pre-programmed execution to intelligent decision-making.

The industry anticipates that customer service will see the most radical improvements from this shift. Intelligent, end-to-end solutions will connect the front and back offices in ways that were previously impossible. For example, they'll give human customer service representatives access to the most relevant customer data, or they'll advise a claims handler of the next best action to take during a difficult or emotional phone call. And they'll create frictionless experiences for customers, such as offering the same high level of customer service at any time on any device. Some of the insurance executives feel that the organization will automate tasks and processes to a large extent or a very large extent in the next three years. The organization will be totally transformed by the emerging intelligent technologies. Adopting smarter technologies will be critical to the organization's ability to differentiate in the market. Smarter decision-making can only be achieved through intelligent technologies that can generate information in real time. Source: Accenture Future Workforce Survey, 2017.8

It won't just be customer service representatives who see the benefits of these smarter processes. The wider workforce will also win. Taking repetitive, easily automated tasks away from skilled, experienced workers frees them to deliver higher-quality work, allowing them to focus on tasks or customers that need a human touch. And their working lives will become more interesting in the process. Embedding intelligent decision-making into insurance processes is already making an impact. South African insurer Santam uses predictive analytics and machine learning to reduce fraud and improve operational efficiency. The initiative saved US$2.4 million in its first four months, and has allowed Santam to accelerate half of processed claims by leveraging straight-through processing.1 Japanese life insurer Fukoku Mutual is using AI to interpret medical certificates and factor in the length of hospital stays, medical histories and surgical procedures before calculating pay-outs to policyholders. It expects the system to increase productivity by 30 percent and generate a positive ROI within two years.

This is not to say that RPA is obsolete. Traditional forms of automation have a role in augmenting AI-centered processes. They can be used to carry out actions across underlying systems once intelligent decisions have been taken. And they can generate cost savings to fund further capabilities in intelligent automation. During your morning commute, you collide with another car while tuning your radio. You contact your insurer's claims hotline, preferring to speak with a human being, and complete a basic FNOL report. The claims advisor establishes that you were at fault and asks you to upload photos of the damage via an app on your phone. The system uses computer vision and machine learning to analyze the images, confirms that you had an at-fault accident, and automatically organizes for your car to be collected and for a courtesy car to be delivered. While you wait, you receive progress updates via the app. simultaneously; a separate algorithm automatically scores the claim. As the predicted risk score for personal injury is high at 63 percent, the claim is pushed to the Claims Dashboard App to be reviewed by a specialist claims handler. The handler contacts the other driver immediately to arrange car repair, a courtesy car and free physio sessions for whiplash.

Unlocking trapped value will do more than save costs. It will create entirely new products and services for future growth. Insurers have invested significantly in technologies and people to support using data for pricing and risk management. But their focus on traditional actuarial capabilities means that data hasn't been leveraged as widely as it might have. Insurers should start using AI to unlock the hidden value in their data for example, by interrogating and visualizing enterprise and customer data in ways that have not previously been attempted or considered. In doing so, data mustn't be kept isolated in silos, or restricted to one part of the value chain. Instead, it should be leveraged across the whole business. Rather than using customers' claims data only to identify fraudulent behavior, why not also use it to generate insights to design better insurance products? Or

use real-time analysis to anticipate customers' needs and offer them a product or service before they even realize they want it? Zurich, for example, is working with EagleEye Analytics and its Talon Predictive Analytics System. Machine learning algorithms produce real-time scoring to better inform decisions in claims management, pricing and underwriting, marketing and distribution.

Insurers should look beyond their own datasets to unlock growth. New types of external or public data could let them tap into new revenue streams. And taking an innovative approach to data will often serve as a catalyst for innovation in other parts of the business. Using AI will generate richer data insights for insurers, and may even open new revenue streams.

Artificial Intelligence
with Deductive analytics

Machine Learning
with Prescriptive analytics & decision engines

Robotic Process Automation
with digital triggers or self service

Robotic Desktop Automation
with manual intervention
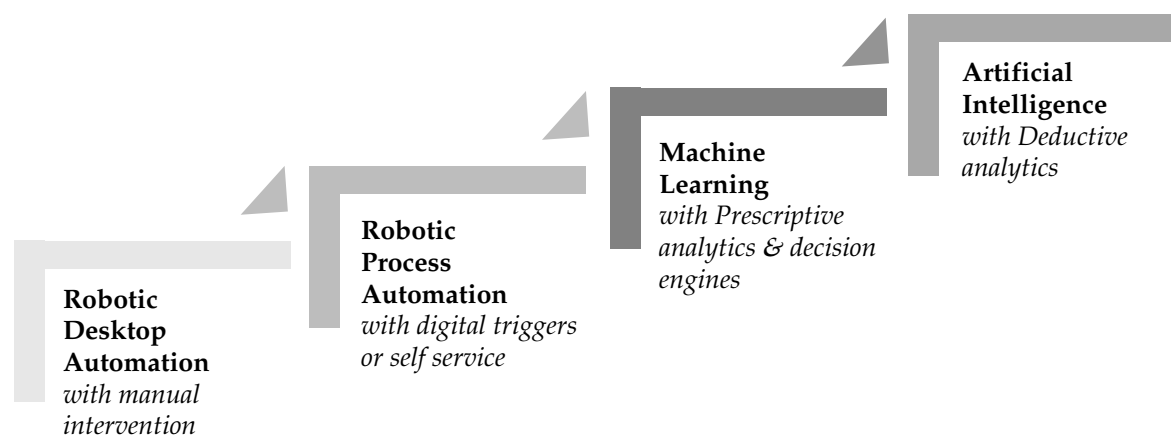
Fig 4- Robotic process automation usability

Conclusion

Artificial intelligence is the future of insurance industry especially for the health care. It helps the insurance companies not only to simplify the process but also increase the efficiency that boost the financial health of the insurance companies. Health issues are now increasing day by day hence to accurate the underwriting pattern to charge the premium accordingly. To mark the presence as per the global practices artificial intelligence is going to help the industry to fight with the fraudulent claims boost accuracy and efficiency to be competitive. It transform the way we run insurance companies helping in engaging the customer through a new edge experiences also allow the industry to be innovative in terms of product development. As the technology growing and changing faster insurance companies may have to face the adoption of new technology inbuilt with artificial intelligence to be more customers centric. Insurers will need to consider internal digital ethics as well. Trust is the foundation of the insurance industry, but in an AI-first world, we will see the emergence of new risk and exposure that will challenge the trust relationship. Insurers, for example, are now developing products and services around AI that involve continuous monitoring of confidential operational business data, individual driving habits, personal exercise and even activity in the home. As the carrier becomes more integrated with the day-to-day life of the insured, they themselves become a potential source of damage or ethical misuse. Carriers will need to protect and secure the flow of this highly sensitive data. They will need to keep in check the advantage that comes from possessing intimate and comprehensive knowledge about the insured.

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3D`S – Disruptions, Demonetization and Digitalization Shaping Up New India

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The last five Years in Indian Economic System has witnessed few revolutionary reforms and the Government has pushed these reforms to improve the financial health of the country. It started with the efforts of financial Inclusion to increase the number of bank accounts for common man followed by demonetization to curb the illegal money and reduce the dependence of the Indian Citizens on cash an important mode of settling their day to day commercial transactions. Demonetization resulted in short supply of new currency and diverted the customer to use digital payments like digital wallets, Paytm and electronic mode of payments. On another hands various initiatives were taken to control ever increasing NPA`S and bank fraud. Though it has been a mixed reaction of the people of India based on the short-term impact of the above reforms introduced but the vision of these reforms is to measure the long-term impact in the growth of GDP and strengthening the Indian Economy. This paper discusses the above reforms in detail their progress and impact in the long run.

Key Words: Digital Banking, Demonetization, Disruptions, Digital India, Financial Inclusion

Introduction

The Indian Banking Financial Services Sector like every other industry is under a process of digital transformation with changing and increasing demands from the customer and as a result banks in order to meet their demands needs to improve the customer experience. Increased operational efficiency is required to meet the increased regulatory scrutiny with the advent of disruptive technologies. As all over the world, the Indian Banks are also facing the pressures of minimum Capital Adequacy Ratio - 9% as per the Basel 3 Capital norms as well as the deterioration in assets quality plus profitability pressures. Increasing Non-Performance Assets and some recent banking frauds have raised the questions of risk management in banking operations and accountability of the top management. With the changing needs of the customer, banks also need to change the dynamics of the market with new cultural and business models. Disrupting existing business models and threat from the competitors both from within the banking industry as well as NBFCs, requires companies to rethink new strategies by discarding traditional business models. Banking and Financial services in India and across the globe has witnessed major disruptions, introduction of new technologies, new products, promoting new players entering into the market as a part of their new strategies. Increasing trends in use of non-cash payment volumes reflects year-on year basis to $389.7 billion by 8.3 percent increases.

In order to support Public Sector Banks, Government of India, Reserve Bank of India and Ministry of Finance has taken an initiative of various banking reforms in the last four years which have created disruptions and ripples in the Indian Economy and banking System as a whole. This paper attempts to analyze how these banking reforms disruptions have served its purpose to achieve the objective for which they have been launched and what need to do next to control the current issues and challenges being faced by the Indian Banking System.

The following banking Reforms and disruptions in Indian banking System is changing the shape of New India – Digital India with inclusive growth and 100% financially Inclusive – A New Way Forward.

Financial Inclusion – Pradhan Mantri Jan Dhan Yojana:

Financial Inclusion is not a new term as opening of accounts for public and Branch Expansion is always an important agenda in hands of banks to ensure access to banking services since nationalization of banks in 1969 and 1980. The main objectives of the initial efforts and introduction of various initiatives like Regional Rural Banks, Lead bank Scheme, priority Sector lending requirements, Self Help Group and Service Area approach with bank linkage is to include the masses and maximum people who are excluded or denied from the financial

services for various reasons. Despite functional and Geographical reach with opening of large branches by Public and Private sector banks, large number of people like farmers, workers, self-employed, pensioners, unemployed, unorganized sectors remain excluded and could not get the benefits of neither liability products (Deposits) nor Assets. (Loans and Advances.) The Target Driven Approach for lending adopted by the banks to social banking was one of the major reasons for the failure of above initiatives for financial inclusion. The banks never treated social banking as a viable with the perception that poor people always wish to avail subsidized rate of interest loan where in fact poor people continued to pay the higher rates of interest through unorganized and informal channels of finance.

To achieve this mission of 100% Financial Inclusion, new scheme PMJDY Launched in 2014 with the help of technology and digital banking is launched to provide   financial services like availability of basic savings bank account, access to need based credit, remittances facility, insurance and pension to the excluded sections i.e. weaker sections & low-income groups. This deep penetration at affordable cost is possible only with effective use of technology. PMJDY is a National Mission on Financial Inclusion encompassing an integrated approach to bring about comprehensive financial inclusion of all the households in the country. This scheme was a huge success as one of the worlds' biggest financial inclusion initiative as recorded in the Guinness Book of World Records in terms of number of 11.50 Crore accounts opened covering 99.74% of households, 31.50 Crores number of beneficiaries and 80871.67 CRORES deposit mobilized in these accounts as shown in Figure 1. The recently released World Bank Global Findex data show the 80% of the Indian adults have a bank account.

Bank Name / Type	Number of beneficiaries at Rural / Semi Urban Branches	Number of Beneficiaries at urban metro centre bank branches	Number of Total beneficiaries	Deposits in Accounts (Crore)	Number of Rupay Debit Cards issued to beneficiaries
Public Sector Bank	13.77	11.83	25.6	65297.60	19.29
Regional Rural Bank	4.30	0.79	5.09	13565.81	3.68
Private Sector Bank	0.59	0.4	0.98	2245.16	0.92
Total	18.66	13.02	31.67	81108.57	23.89

Figure 1: Pradhan Mantri Jan - Dhan Yojana (All figures in Crore) as on 23.05.2018 – Source www. pmjdy.gov.in

Figure 2 shows that the credit deposit ratio has for the rural population has also increased 41% in 1999 to 66.9% in 2016.
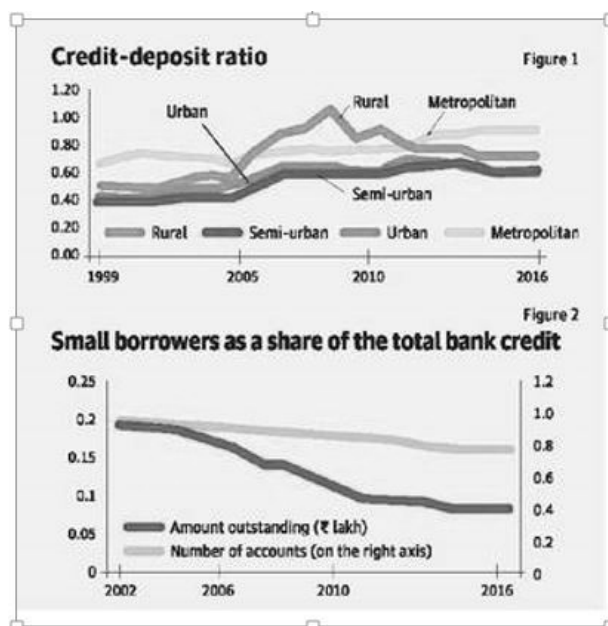

Figure 2: Credit Deposit Ratio – Source: The Hindu, 29th May, 2018

Demonetization

On 8th November, 2016 Government of India introduced demonetization of its two high value currency note denomination of Rs. 500 / and Rs. 1000/ - Demonetization was one of the revolutionary step initiated with the main objective to make the country free from black money, curb corruption, increase Tax Base and boost cash less transactions. This was the third time such a bold step was taken by any Government in India. First time it was in 1946 when Rs. 1000 /- and Rs. 10000/- was demonetized followed by the reintroduction of both these notes with additional note of Rs. 5000 in 1954. Second time in 1978, then Prime Minister Shri Morarji Desai banned Rs. 1000 / -, Rs. 5000/- and Rs. 10000/- out of circulation. Another objective of demonetization was to identify the source of large cash holdings with the people and bring them in the bracket of Income tax. Following figures shows the success of this Initiative taken post demonetization.

Demonetization was a bold step against terrorism, corruption and fake CURRENCY. It was observed that post demonetization for few months there was shortage in supply of currency which pave the way for the public to use more E Banking transactions through ATM, Digital Wallets, Debit and Credit Card. Many Bankers and Economists have appreciated this initiative but commented that Implementation was not properly and correctly done. The major issues faced by the general public was that there was not sufficient new currency available, lack of manpower in banks , loopholes in the currency exchange process and hike in price of essential commodities.

RBI made big revelation that as much as 99 percent of the banned and junked note returned to the banks. On November, 8, 2016 there were 1716.50 crore pieces of Rs. 500 /- and Rs. 685.50 crore pieces of RS. 1000/ - in circulation, totaling Rs. 15.44 lakh crore. RBI also said that 8.9crore pieces of Rs. 1000/- notes or 1.3 percent of the scrapped ones have not been returned.

Digitalization

During Demonetization phase when only Rs. 100 / - and lower currency denominations are available with public and the new currency notes of Rs. 2000/ and Rs. 500 /- are in short quantity in distribution, public has no choice but to resort internet banking funds transfer and online digital banking products and digital wallets. Mobile applications downloads have shown tremendous increase as well as number of mobile transactions. According to analysts at Technavio, by 2018 the mobile wallet market in India will grow at a CAGR of 140%, while the global mobile wallet market will register a CAGR of 34% by 2020. Reserve Bank of India and NPCI has taken various initiatives in past by introducing various E Banking / digital banking products like NACH , RTGS , NEFT ,BHIM , UPI .To increase the usage of E banking products lots of marketing efforts , Financial literacy Campaigns, and awareness is being created to shift the people from ash mode of transaction for their daily spending needs .

Paytm, Ola Money are few innovative examples of digital payment solutions which have attracted customer and common man starting downloading these applications for making payments for shopping at mom-and – pop stores, electricity bills, dish TV, ticketing and funds transfer from one bank to another. The result has been mobile wallets like Paytm witnessing 200 percent increase in app download numbers, and Ola Money seeing a 1,500 percent increase in wallet recharges.

It appears that the Government of India has a planned vision to connect all the high number of accounts opened under Financial Inclusion PMJDY scheme to connect through the digital and internet and mobile banking mode. Earlier mobiles are being used only for voice and SMS services where as now Mobile wallet are offering various services relating to funds transfer as well as value added services. Objective of Indian Economy as less cash intensive and Digital India vision appears to be on the right path of success with launch of 4G Internet and increasing mobile penetration. Following data from Reserve Bank of India shows the increasing number of Mobile banking. Point of sales, Credit and Debit Card Transactions. Mobile as a point of sale (PoS), point of purchase and point of acceptance have the potential to lessen the digital divide between urban and rural India, along with drawing the masses into the net of financial inclusion.

Digitalization has reinvented and innovated the old traditional models of banking into new transformation process like the internet of things (IOT), cloud computing, block chain, robotic process automation (RPA) ,

digital wallets . The banks focused on various disruptions in digital payment growth which lead to digital revolution with the entry of various new FinTech players. Blockchain technology is playing an important role and is the future of growth in digital payments to evolve India to cashless economy. The following figures show the increasing trends of digital banking payment system like Mobile Banking, IMPS and M Wallets. Trends of card payment system reflect the clear shift on the customer from credit cards to debit cards.

S No	Payment System	Volume (Rs. Millions)	Value (Rs. Billion)
1	Mobile Banking	1870.02	14722.19
2	Immediate Payment Services (IMPS)	1009.8	8924.98
3	M Wallet	3025.98	1086.75
4	RTGS	124.46	1467431.99
5	EFT /NEFT	1946.36	172288.52
6	Credit Cards	1412.97	4626.36
7	Debit Cards	11945.65	33588.61
8	PPI Cards	432.63	310.41
9	NACH	2503.46	10736.12
10	Cheque Truncation System	1138.05	79451.24

Figure 3: Payment System indicators – Source RBI Bulletin May 2018

Various other Initiatives:

New Banks Board Bureau (BBB) was appointed on 12th April, 2018 under the Chairmanship of Mr. Bhanu Pratap Sharma, former Chairman Recruitment & Assessment, and DRDO. The main objective was to select top management in public sector banks and   introduction of a framework and concept for fixing the accountability in Public Sector banks. BBB was functional from 1st April, 2016 under the chairman ship former CAG Mr. Vinod Rai and set up for two years initially. Compendiums of various recommendations were made to the Government regarding capital raising plans and Governance issues. BBB played an important role in setting revised performance indicators and professionalizing the PSB`s.

Insolvency and Bankruptcy Act (IBC) came into force 28th May, 2016 and notified in The Gazette of India. This code was a major step to consolidate the present framework by creating a single law in order to resolve the insolvencies of the companies which at present is a long process. This will also save the cost and time and will offer economic viable arrangement by protecting the interest of small investors, lenders and Bankers.

On 19th May, 2018, the first big resolution case under the IBA Act happens, when Tata Steel announced the completion of Rs. 35200 Crore acquisition of Bhushan Steel deal. This was among the first companies out of 12 companies which RBI has referred to National Company law Tribunal Act (NCLT) for insolvency and bankruptcy. This cash payment to the bank will reduce the burden on various Banks as well as new hopes to the banking industry to recover their neck deep NPA`S through IBC route.

Amendments in The Banking Regulation Act and NPA ordinance in April 2017 by Government of India was the biggest reform to enable the banks to resolve their biggest challenge of increasing NPA`s as the banks are quite burdened with bad loans. The proposed amendments also empower banks to reduce their large Nonperforming Assets. It also seeks to give protection to the board members of Credit committee to take bolder and pragmatic decision like valuations, evaluations, extent of hair cut are taken in good faith and based on policies, principles, collateral value and regulations. The RBI and banks with the help of oversight panels and independent professionals to shield bankers who fear pull up and interference by the legal agencies especially the 3 Cs – CBI, CAG and CVC – which had hampered hard decision making.

While experts view the ordinance as a step towards more transparency, time-based resolution of stressed loans and higher decision-making capacity by bankers, the implementation is yet to bear fruits. Today, PSBs in total have a stressed loan ratio of 12.3 percent, much higher than their private sector peers.

Approval Framework for Proposals to Amalgamate Nationalized Banks: Union Minister Mr. Shiv Pratap Shukla said Government is not considering any proposal of merger and acquisition of Public Sector bank but however approval frame work for proposal to amalgamate nationalized banks has been put in place through Alternate Mechanism. (AM). last year in August Cabinet gave the principle approval and in November, 2017 a new panel under the Chairmanship of Finance Minister Shri Arun Jaitley was set up to discuss and examine bank`s proposals for in principle approval to formulate schemes of amalgamation.

This process of amalgamation was kick started last year with country's largest bank State Bank of India having merged its five associates and the all-women Bharatiya Mahila Bank with itself from April 1, 2017. With this historical Merger State bank of India entered into the list of Top 50 Global Banks in terms of assets, with 24000 branch network, 37 core customer base and 59000 ATMs.

Asset Quality Review (AQR): In 2015 RBI initiated the Asset Quality Review of high level of loans and advances disbursed by the banks to ensure that banks should focus on cleaning their Balance Sheets and set aside the pool of funds by making adequate provisioning of their sub-standard assets. In December 2015, when AQR was initiated, 150 companies were downgraded by different banks as NPA. This has resulted in losses to many bank but the objective was that the profitability of banks may be impaired in short run but the banking system once cleaned will pave the way to support economic growth in a sustainable and profitable way.

Prompt Corrective Action: (PCA): RBI also revised its 15 years old Prompt Corrective Action (PCA) guidelines of 2002 in April 2017 to put in place a some trigger points to control , assess , monitor and take corrective action to avoid bank failures . PCA is based on CRAR – A tool to measure the strength of Bank`s Balance sheet, ROA and NPA. Eleven public sector banks are already having come under the PCA framework which are restricted to do further lending, opening new branches and staff recruitment,11weak banks have been allocated capital Rs.52311 Crore to strengthen their capital base plus 9 strong banks have been allocated Rs. 35828 Crore. PCA focus on Asset quality, profit and capital of the banks and monitor closely leverage of the bank.

Conclusion

With programs of financial inclusion, digitization of the economy and increased use of smart phones, online transactions are already quite popular among the urban Indian population leading the banking system in India at Crossroads. On one hand Government is pushing Indian Economy to Digital Era and Cashless and on another hand the banking landscape is facing increased competition from not only traditional competitors but from new payment banks and new-age Fin -Techs. Large technology and telecom firms driving innovations in the financial access domain as the entire-ecosystem reflect shift from an increase in the number of transactions in the account opened as well as availing other credit and loans services. All the above measures and disruptions focus on three important pillars of Basel 3 – Minimum Capital Adequacy Ratio, Supervisory Review and market discipline to strengthen the capital base of the bank, Financial Stability and Risk Management. Financial Stability is the most important thing which focuses not only the total amount of credit in economy but its major concern is the quality of the corporate and firms that are getting funded. The Recent RBI Financial Stability Report reflects the overall assessment on the stability of India's financial system and its resilience to risks emanating from global and domestic factors. The Report also discusses issues relating to development and regulation of the financial sector. It can be concluded that India`s GDP growth in Q4 – Jan –March 2018 touching 7.7% was seven quarter high growth and retaining the fastest growing major economy is a direct impact of above disruptions and banking reforms.

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Conditional Volatility in Exchange Rate: Empirical Evidence from India

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Fiscal stability, foreign exchange policy and value of currency are getting impacted by level of fluctuations in exchange rate of any country. These days currency market is one of the most volatile markets. In this paper we have investigated volatility of Indian foreign exchange market. Over the last two decades, high fluctuation in Indian rupee (INR) value has become very important to investors as well as decision makers. Exchange rate volatility in INR against USD investigated for the period April, 1995 to March 2018.For this purpose, Generalized Autoregressive Conditional Heteroskedastic (GARCH) models are used instead of simple models of constant and one period variance in forecasting. Indian exchange rate volatility exhibit evidences of conditional shocks having a positive effect, asymmetricand transitory effect on exchange rate volatility.

Keywords: Foreign Exchange Rate, Volatility, Currency, Indian Rupee, GARCH Model

Introduction

Foreign exchange rate volatility means the level of fluctuations due to the inflow and outflow of the particular currencies (Hakkio, 1984, De Grauwe, 1988). Exchange rate volatility is one of the important factor which affects overall economic activities of any economy (Asseery& Peel, 1991),to plan proper monetary policy, it is important to understand the behavior of exchange rate in terms of association and spillovers of return and volatility (Longmore &Robinson, 2004).Exchange rates and trade related activities of any countries have strong association. Globalization of markets leads to interactive linkages among different currency rates. Therefore, recent depreciation in Indian market may be result of global integration of markets.

Different techniques used to study the volatility patterns can be observed in literature (Poon and Granger, 2003, McMillan and Thupayagale, 2010, Kamal et.al., 2012, Diebold and Nerlolve, 1989, Nelson, 1991). Time dependent clustering pattern present are difficult to elucidate and identify through simple tools of variance and standard deviation (Bollerslevet al., 1992, West and Cho, 1995, Engle and Patton, 2001, Olowe, 2009). Therefore, ARCH model (Engle, 1982) and its Generalisezedform (Bollerslev, 1986) are considered most suitable approach to employ. These models are found to be most effective in case of conditional and unconditional volatility identification in chronological data and understand its influence economic growth (Rossi, 2013, Evans and Lyons, 2002, Enders, 2004, Shin, 2005, Charles et al., 2008, Jakaria and Abdalla, 2012). It is one of the major concern of any economy in developing or developed to understand the economic and financial impact of exchange rate volatility (Ahmad, Ashraf & Ahmed, 2005, Bhar and Nikolova, 2009, Ahmed and Suliman 2011) volatility spillover among different markets (Melle, 2003, Diebold and Yilmaz, 2009, Savva, Osborn and Gill, 2004, Li, 2007, BackettiandSellon, 1989, Chung and Ng, 1992, Liu and Pan, 1997, Engle et al., 2012). In this situation, EGARCH has been used by many researchers to investigate not only spillover but also its direction (Mukherjee and Mishra, 2008, 2010, Omrane and Christian, 2010, Bonga and Hoveni, 2013). There are also some other studies which talks about volatility spillover between different exchange markets including India (Sahoo, 2012, Kumar, et.al 2016).These models are employed even for the study of accumulative effects during weekends and holidays (Miller, 1984, Theobald and Price, 1984, Abraham and Ikenberry, 1994, Kaur, 2004, and Cai et al., 2006, Jorion,

1991, Bartov and Bodnar, 1994). There are some papers where which reveals the application of these models in equity valuation (Prasad and Rajan, 1995), exchange rate risk sensitivity (Chamberlain et al., 1997).

Lower association among assets or performance of different countries leads to diversification(Markowitz, 1952). Spillover effect is a challenge for domestic markets and financial development globally (International Monetary Fund, 2007, Kalemli-Ozcan, Sorensen &Volosovych, 2010, Engle, Gallo and Velucchi (2012), Claeys and Vasicek (2012), Antonakakis (2012). Spillover effects of exchange rate volatility are also observed from financial market to other asset class markets and strong evidences of these impacts from crude oil prices to stock markets, Euro stock market and bond future markets in developing as well as developed including domestic and international markets (Agren, 2006, Chulia and Torro, 2008, Yang and Doong, 2004, Solnik, 1974, Elton and Gruber, 1992, Dumas and Solnik, 1995, De Santis and Gerard, 1998, Aggarwal, 1981, Soenen and Hennigar, 1988, Roll, 1992), while there are other papers which exhibit negative or no relationship between different asset class markets (Soenen and Hennigar, 1988, Chow, Lee and Solt, 1997).

With the passage of time particularly in last couple of decades, India has become important global financial market. Capital flow, shock spillover and integration of markets affects macroeconomic environment of any economy (Kocenda, Bubak and Zikes, 2011, Melvin and Taylor, 2009, Nikolaos, 2012).Different ARCH models reused to investigate exchange rate volatility in different European markets and identified long-run volatility and spillovers among these Diebold and Nerlove, 1989, Bollerslev, 1990, Laopodis, 1998, Black and McMillan, 2004, Melvin and Melvin, 2003, Engle et al., 1990, Chowdhury and Sarno, 2004, Inagaki, 2007). It has been found that even in correlated markets as evident from the study of major Asian markets and the US stock markets varies considerably in terms of integration over a period of time (Srivastava, 2007, McMillan and Speight, 2010, Sahoo, 2012).

To attain fast growth, in most of the economies of developing world are making frequent changes in their policies. Foreign exchange market is one of the areas which get impacted most in case of any modification in policy by government or central bank of the country. In India for the past few years many significant decision are taken to match the pace of growth with fast growing world. Therefore to capture this impact through exchange rate volatility in Indian market we have examined the return and volatility. Specifically, we undertake an extensive analysis to investigate how return and volatility shocks are transmitted. The predictions of volatility spillover maybe help to decision makers.

Data and Research Methodology

To examining exchange rate volatility, daily rupee exchange rates against US dollar (INR/USD) data for the period of April, 1995 to March 2018 have been obtained from IMF online database. Data of daily exchange rate is converted in to daily returns to make series stationary by taking logarithm of exchange rates. Thus, volatility in exchange rate return return in 't' time period $(RET_t)$is given as:

$RET_t = L (E_t) - L (E_{t-1}))$

Where, L is natural logarithm, $E_{t}$and E_{t-1} are exchange rates at time period t,and-1.

Auto-Regressive Conditional Heteroskedasticity Model:

Autoregressive conditional heteroskedasticity (ARCH) model (Engle, 1982) and GARCH model (Bollerslev, 1986, Taylor, 1986) are used for the analysis.

ARCH Model: Mean function and conditional variance of ARCH (1) are written as;

$$RET_t = c + \beta\, RET_{t-1} + \varepsilon_t$$
$$\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2$$

GARCH Model: Mean equation and variance equation of GARCH(1,1)are written as:

$$RET_t = c + \beta\,RET_{t-1} + \varepsilon_t$$
$$\sigma_t^2 = \omega + \alpha\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2$$

Where constant, ARCH term and GARCH term are denoted by $\omega, \varepsilon_{t-1}^2\ and\ \sigma_{t-1}^2$ respectively.

In addition to above models, asymmetric and spill over effects of volatility is obtained by using GJR-GARCH (Glosten, Jagannathan and Runkle, 1993) and EGARCH (Nelson's, 1991) respectively.

GJR-GARCH Model: $\sigma_t^2 = \omega + \alpha\varepsilon_{t-1}^2 + \beta\sigma_{t-1}^2 + \gamma\varepsilon_{t-1}^2 I_{t-1}$

Where $I_{t-1} = 1 if\ \ \varepsilon_{t-1} < 0$ and. $I_{t-1} = 0$

EGARCH Model:

$$\log(\sigma_t^2) = \omega + \alpha(\frac{\varepsilon_{t-1}}{\sigma_{t-1}}) + \beta\left[(\frac{|\varepsilon_{t-1}|}{\sigma_{t-1}}) - \sqrt{\frac{2}{\pi}}\right] + \gamma\log(\sigma_{t-1}^2)$$

Analysis and Discussion

Summary of statistics of first difference of log series of exchange rate of US Dollar are given in tableI.

TableI: Descriptive Statistics of Return on INR

Statistics	Mean	S.E	Median	S.D	Kurtosis	Skewness	Range	Minimum	Maximum	Sum	Count
Results	-0.0001088	6.31E-05	-2.03E-05	0.0046638	6.3410339	-0.3132918	0.0719986	-0.0404665	0.0315321	-0.5953648	5470

It can be observed from the table-I that return shows the high kurtosis and negative skewness in the data. Jarque-Bera (JB) test of normality was also conducted to test consistency of return distribution and obtained inconsistency at 1% level of significance.

Testing for Stationarity of the Series

Before using any of the tools for analysis to draw inference about the exchange rate volatility, all the series need to be tested for stationary. Therefore, Augmented Dickey-Fuller (ADF) test (Dickey and Fuller, 1979), Philips-Perron (PP) tests are applied to check weather series are stationary or non-stationary at 1% level of significance (Table-II).

Table II: Results of Unit Root Test

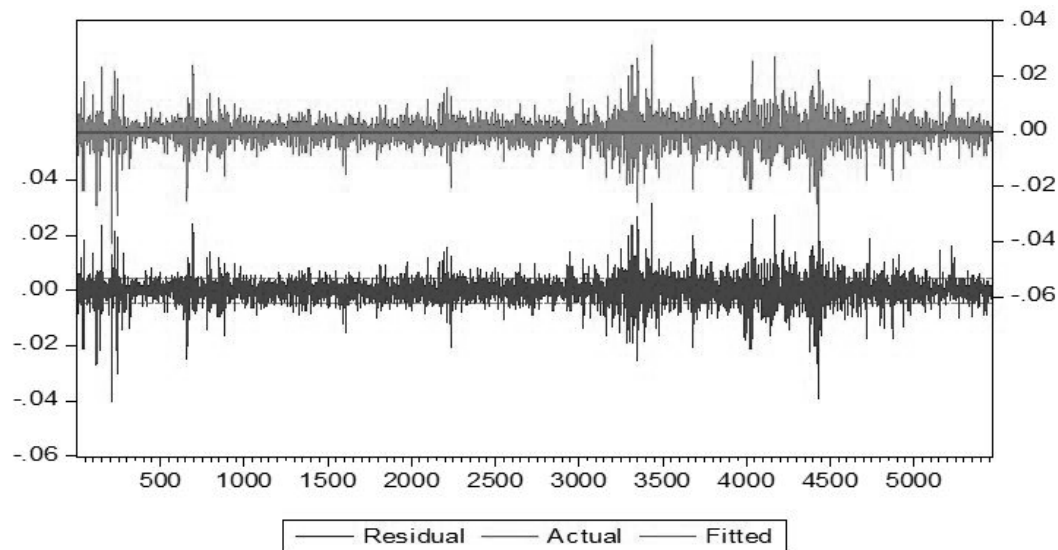|	Augmented Dickey-Fuller test				Phillips-Perron test			
	Statistic	Critical values			Statistic	Critical values		
		1% level	5% level	10% level		1% level	5% level	10% level
RINR	-55.1429	-3.43137	-2.86187	-2.56699	-75.7563	-3.43137	-2.86187	-2.56699
Prob.	(0.0001)				(0.0001)			

Testing for Heteroskedasticity

Figure 1: Clustering in exchange return of INR against US Dollar

Presence of heteroskedasticity in residuals identified in the return data series using Engle's Lagrange Multiplier (Engle, 1982) which leads to the association of magnitude of residualsat different lag (Chakrabarti and Sen, 2011). Significance of LM statistics conducted for residual in return data series confirms the presence of ARCH effect. Therefore, GARCH model is an appropriate techniqueto estimate the volatility.

Table III: Estimation Results of GARCH(p, q) Model

	GARCH (1,1)	TGARCH (1,1)	EGARCH (1,1)
Constant	6.02E-07*	6.86E-07*	-0.570000*
α	0.112178*	0.060265*	0.218176*
β	0.862095*	0.094952*	-0.066872*
Υ		0.860003*	0.963108*
Residual Diagnostics: ARCH-LM Test			
F-Statistic	0.937746	0.818063	2.249863
Prob. F(1,5467)	0.3328	0.3657	0.1336
*indicates that coefficient are significant at 1% level of significance			

Analysis obtained in IIIreveals the effect of past volatility on the current volatility of return using GARCH model. Application of TARCH model depicts the the presence of leverage effect EGARCH model confirms the existence of asymmetric behavior. Although Akaike info criterion and Schwarz criterion suggests TARCH as most suitable model for interpretation in this analysis but results from other models can also be utilized to understand situation for better inference. Finally, identification of no autocorrelation while testing heteroskedasticity in the residuals concludes the analysis part in this case.

Conclusion

In this paper, investigation of exchange rate volatility is conducted using GARCH models. Identification of volatility clustering in return of exchange rate led to the use of GARCH (1, 1) model. We have found strong evidence of time-varying volatility as periods of high and low volatility tend to cluster. In addition to GARCH (1, 1) other models like TARCH (1, 1) and EGARCH (1,1) are also utilized to estimate. Overall, volatility seems to be

of a persistent nature. Exchange rate return shows significant leverage effects. Asymmetric GARCH (EGARCH) to capture their volatility clustering and TARCH (1, 1) disclosed that as compare to negative shocks, positive shocks have more impact on the volatility of return. This observation may help investors or policy makers. Modeling of exchange rate return using these models provides good volatility forecasts for optimum portfolio allocation, performance measurement and could help investors seeking to avoid risk. Investors may choose to adjust their investments by using more sophisticated dynamic diversification approaches to hedge predicted volatility increase. Understanding of conditional variance and the pattern of volatility may help in case where high growth of the economy is anticipated and increasing interest of foreign investors towards the country. These days Indian foreign exchange markets have become great opportunity for investors. This research may benefit monetary authorities to consider the impact of shocks (global or domestic) when formulating and implementing economic policies, relate to exchange rate to make Indian foreign exchange markets a great opportunity for investors.

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Blockchain- Driving Innovation

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Blockchain has been the most talked about tech innovation in the recent past. However, people who have little knowledge about it have always associated it with something complex and difficult to understand. But actually, it is not so. This article is an effort to simplify the concept of blockchain and reflect its working in an easy manner. It also evaluates various potential uses of blockchain in detail such as voting and legislation, ride sharing, cloud like storage and much more. It explains how this relatively new technology is used to record transactions in the back- end in famous cryptocurrencies such as Bitcoin and Ethereum. It will mainly talk about how this concept can be used within insurance sector to drive innovation and smartness in the industry. At the end of the article is a SWOT analysis of practical implications of this technology in various sectors.

Keywords: blockchain, innovation, digital ledger, technology, futurism

Introduction

Currently, there are four types of currencies in circulation, the real physical currency being the first, that is, legal tender in the form of notes and coins, the plastic currency, in the form of credit cards and debit cards, third being the virtual currency created by banks and departmental stores offering reward points to their customers, the last one being the cryptocurrency, which is going to be the major focus in this paper. The concept of block chain is the most talked about virtue in recent times. Though the development of the blockchain systems was proposed in a research work during early 1990s by Stuart Haber and W. Scott Stornetta, where they wished to implement a plan in which documents of timestamp could not be tampered with backdated, it was not until late 2000s when Satoshi Nakamoto used the concept in creating his digital currency bitcoin which gained worldwide attention. The words 'block' and 'chain' were used separately by Satoshi in his original paper but were eventually popularized as a single word by 2016,by storing data across its peer to peer network, it eliminates the risks associated with data being held traditionally under a centralized authority.The bitcoin design of using blockchain has inspired other applications. Now various developmental works have been started by different countries to put the technology of block chain to various uses due to the wide variety of advantages that it offers. The formal definition of blockchain may be 'a decentralized, distributed and public digital ledger used to record transactions chronologically among many users'.
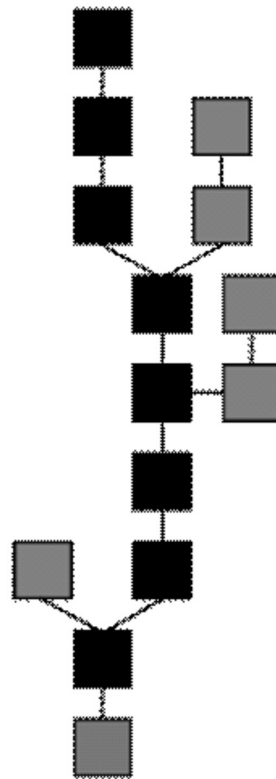
## Figure 1 shows typical structure of a block chain:

In this diagram showing a blockchain formation, various blocks from different nodes connect together to form a long chain of records. Each block added gives way to addition of adjacent blocks. The longest chain of blocks is called the main chain (here the black one, ending with green block). The blocks outside of the main chain, marked with purple here, are called orphan blocks.

Concept and Working of Blockchain: Blockchain: Basics to Skies
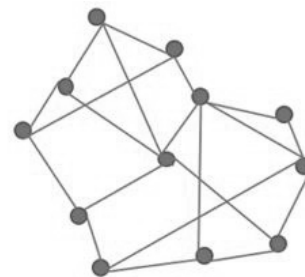
The literary meaning of the word blockchain is "a digital ledger". Just like we create ledger in accounting to maintain records of transactions such as debits and credits of the account holder, it is a protocol used to record such transactions digitally.It is a chain of blocks that contain information. The advantage of a blockchain system is that information once stored in a block becomes very difficult to temper with. The logical reason behind this can be the structure of a block. Each block has a hash which uniquely identifies it. This hash is a code which changes when the information contained in the block changes. In a chain of blocks where information is passed on from one block to another, these hashes play a very important role. Once an information packet leaves a block to enter the adjacent block, if it correctly identifies the hash which is unique for the second block, it flows, however if the second block has been tampered with, the hashcode of the second block changes which is quickly identified by the information flow of the first block. So, the information cannot flow further making the whole system of chains disrupted. The concept of blockchains has become famous because it has been widely used by the cryptocurrency – Bitcoin to record transactions. The kind of information contained in the blockchain depends on its usage. For example, Bitcoin stores information about the name of seller of bitcoin, purchaser of bitcoin and the amount of transaction made. Block chain makes multiple copies of the information and distributes them over all the nodes associated in the network as depicted in the diagram below. Here each dot represents a node and the lines represent their connection with each other, eliminating the presence of a central authority who maintains database. Blockchain may be used over a private or a public network. In private network, all parties related to a transaction are members of a closed group. Such a transmission cannot be viewed by anyone else who is not a part of this group. In public group, anyone can write data without anyone's permission which can be viewed by everyone.
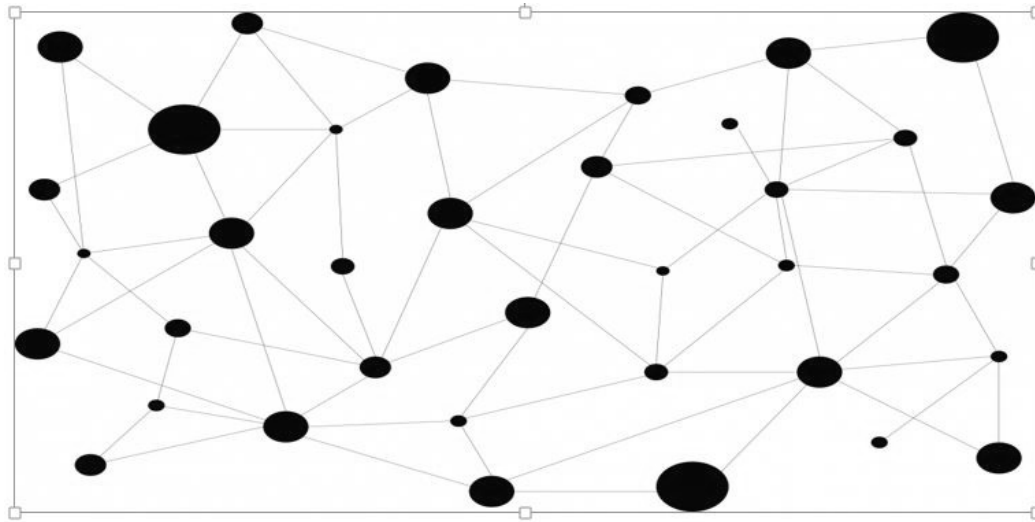
Traditionally databases have been maintained by organizations for the kind of services they provide. There is a risk of these organizations interfering and manipulating the data for their own motives. Even if the organizations themselves assure you of not tampering with your data, there is always the risk of hackers protruding into the database systems and tempering with the useful information. The processes of organization included delays in extracting Information. Blockchains have effectively fought with this problem as multiple copies of data stored in the form of blocks are generated and distributed to each node connected to the network which can view it.
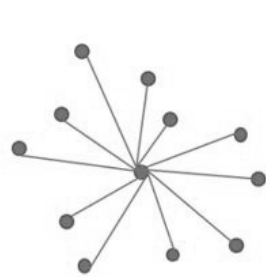
Traditional Central Processing Network   Blockchain Network

Fundamental functionality of blockchain makes its database secure in the following way:

Each hash code of every block is uniquely written with a link to the previous code. Anyone changing the block in between the chain will make the adjacent blocks non-functional. This can be understood with the help of an example:

Block number	1	2	3	4
Hashcode	12	23	34	45

Second block's information is written only when the hashcode matches the previous information. This happens in all the four blocks. So, growth of block chain in such a manner is allowed by the system as no entity is tempered with.

Block number	1	2	3	4
Hashcode	12	23	53	45

Here the third block has been tampered with. So, the adjacent blocks will not be able to synchronize with it. And this saves our purpose of a reliable database. To temper with data, the attacker will have to start tampering with the very first block of the chain and then move further, which is practically very difficult. Blockchains are

governed by a set of rules called the consensus protocols. These decide what database can be changed by whom and at what time. However, it makes sure that each change in the record is recorded in the form of blocks one after another, in non-overlapping time periods and is visible to all.

How is blockchain used in cryptocurrency world?

Cryptocurrencies such as bitcoin are not physical assets and are totally decentralized, having no regulating authority. There are two methods by which one can obtain bitcoin, the most famous cryptocurrency. First one-can mine bitcoins, that is solving complex mathematical problems using computer software to obtain bitcoins but mining has become a very difficult task nowadays because only a fraction of bitcoins are available for mining out of which most of them are already mined also, in spite of complexity of mathematical problems, 25 new bitcoins are mined every ten minutes. other method involves purchasing bitcoin using currency exchange or receiving bitcoins from other users in exchange for the services provided to them. Infact, many major platforms are using bitcoins as an exchange medium like KFC, amazon etc. settlement of transactions using cryptocurrency which uses blockchain technology is very fast and it incurs no transaction charges. in order to be able to use bitcoin, one has to make an account on any digital wallet which can be used to store and transfer bitcoins.

Cryptocurrencies such as Ethereum and bitcoin use blockchains to keep a systematic record of ownership of currency. Whenever someone wishes to spend their bitcoins they record a transaction stating the number of bitcoins to be transferred to another person. The record debits the number of bitcoins from the sender's account and credits it to the receiver's account and stores this data permanently. A chain of events is formulated to show how ownership of digital currency changes hands. A cryptocurrency is a digital bearer bond and does not have a centralized authority. Instead, it uses its members of the network to approve any transaction.

Bitcoin mandates its users to record all the transactions over the digital currency into a publicly issued log called the blockchain, failing which the transaction wouldn't be considered valid. This mechanism ensures that digital currencies are forwarded only once and the transfers are recorded chronologically. As the number of transactions grow. the chain of verified transactions increases in length. The longest chain of transactions is the verified and trusted chain.

How has the concept of blockchain been proposed to put to various uses other than cryptocurrencies?

Many of us must have heard of blockchain technology and directly associate it with the newly emerged cryptocurrency bitcoin, but what we all don't know is that blockchain protocol can be used for more exciting things like sharing rides, building nations, cloud like storage, voting and legislation and much more.

Blockchain for sharing rides:

La'zooz is a company which is using blockchain technology to provide ride sharing to its account holders. The distributed ledger program of blockchain helps the company to share real time data of sharing availability with its customers. The company has offered its customers a Smartphone app through which they can do ride mining. To earn zooz tokens, people can do the following:

a.   Ride the vehicle after opening the app, turning GPS on and driving for about 20 km over 10km per hour.

b.   However not everyone needs to be a driver to earn zooz coupons, people can either buy zooz coupons or

earn them by making others join the community.

With zooz coupons, people can pay for rides from other la zooz users or convert them into other fiat currencies like USD or Euros. The advantages of this system are that it is a decentralized system and the rides can be bought without use of fiat currency. However, currently people can only access zooz coupons and collect them using the methods explained above but they are able to use these coupons only once a certain critical mass of zooz users is created in the region. The blockchain concept is believed to revolutionize the sharing economy. Just like sharing digital currency with individuals beyond organizations and nations, this ride sharing concept can also be thought as the same. That is the power of decentralization! There isn't any organization that controls the protocol. It is an open protocol that can be used by anyone as per their needs.

There has been a big buzz in the city for the sharing economy friendliness of blockchain technology. Slock. it is another example. This company uses the concept of blockchain to enable its users to find, rent, sell or buy any commodity at an effective price as settled by both the parties through smart contracts that can be managed by its smartphone application.

Voting and legislation:

By taking votes as transactions, we can ensure that the ledger records the information of voters and everyone can agree upon the final count. It works like this:

Users receive vote coupons in their apps just like they receive voter ID cards from the government. This vote coupon can be used only once, that is, it can be sent to an address only once, avoiding the problem of repetition of votes. Each political party has an address to which voters send their coupons. The votes can be sent anonymously and a public ledger is created displaying which political party gets how many votes. It will speed up the whole election process as the voting coupons can be sent to consumers online, they no longer have to stand in queues and wait to get themselves registered for the voter ID cards. Nor will the public have to wait for a number of days to get election results. People can vote as per their convenience as they do not need to go outside in scorching heat or bad weather to vote. It will increase the turnout ratio (the number of people who actually voted divided by the number of people who could vote). It will increase transparency in whole procedure as redundant copies of election results would be distributed to all the nodes connected in the network and they will be updated in real time.
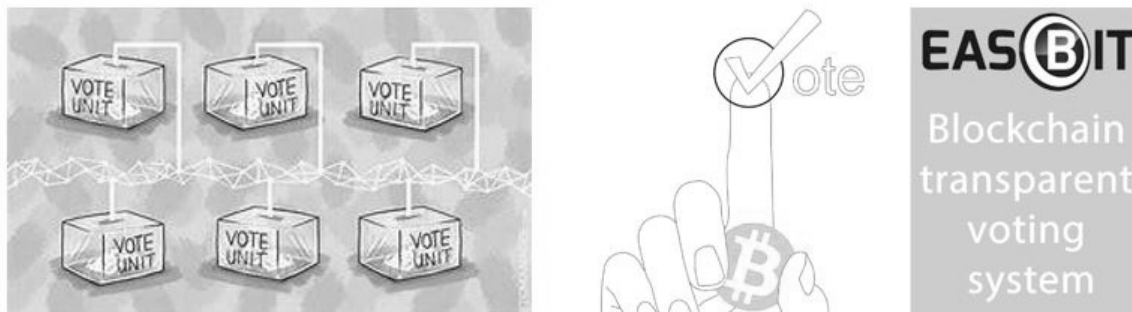
Government services – Bitnation

It creates a way for people to be citizens of nation and communities online. It provides government like

services such as recording marriage event, death and birth events. The persons can enter into the nation using their own will and once they enter some information, it is permanently saved on the network. It can be used to record property related transfers, business and legal contracts etc. This concept works beyond political and physical boundaries. In October 2014, a couple in Disneyland was the first ever to record their marriage on blockchains. Such kind of system may allow citizens to pay only for the services they wish to use. Such a kind of network in real life is Decentralized Borderless Voluntary Nations.

How can blockchain drive insurance industry in near future?

The potential uses of blockchain for insurance sector are growing each day. This includes a wide variety of services like:

a. To save internal costs related to stationery and paper work, insurers can ask the customers to submit their KYC (Know your customer) details online on blockchain networks.

b. A decentralized digital repository can be used to record claims experience of a customer, active policies and medical history. Insurers may be able to identify fraudulent and suspicious claims and this will help them improve their claim ratio.

c. It can help the insurers to provide a better customer experience by decreasing the time taken to process claim as earlier insurers need to go through files or records maintained at different places. Now, with the ease of technology and important information ready at your doorstep, insurance services can be revolutionized for a new digital world.

d. The risk selection process can be enhanced using better available data, chronological records, and applying efficient data analytics on it. It will help the insurers to develop more accurate actuarial models and design products according to market suitability.

e. Payment of premiums can be made easy with the use of digital currencies like bitcoin, though other digital payment models such as net banking, paytm may be accepted to make a digital move as the fiat currency is always a more reliable form than cryptocurrency.

Blockchain is already disrupting the wider financial services world and is now starting to make its mark on insurance. In an era of "point innovations" such as mobile apps and robo-advice models, blockchain technology stands out as a more foundational or architectural development. In that sense, blockchain may support, and subsequently drive, increased use and broader adoption of the many other digital innovations that have helped reshape the Insurance landscape.

Insurers skeptical of the hype should recognize how blockchain's enablement of increased trust and transparency speak to the heart of the insurance business. After all, the industry's inherent bond of trust and "promise to pay" are based on disclosure of accurate personal data describing the insurable interests of the client, the agreement to a contract between two parties and timely exchange of payment. Blockchain can help remove friction, errors and risks from all of these essential steps.

There is substance behind the hype, but the insurance industry must work out on the limitations of the technology before taking concrete actions. They should invest their time and money to find some alternatives or solutions for the foreseen problems. As soon as the solutions are found, the insurers must make investments to be in a position to take advantage of efficiencies and opportunities blockchain technology can deliver long term.

Observations -SWOT Analysis of Blockchains for future applications

Strengths	Weaknesses
Saves time, data security as of now	Requires huge initial set up costs for infrastructure
Transparent	Maintenance of huge volumes of data that is recorded is a challenge

Simpler, accessible and huge practical potential system	Awareness about its usage has to be spread and training to be provided to all the users whenever it is implemented in any sector. This incurs costs.
Opportunities	**Threats**
Can be applied to various sectors which maintain databases	No centralized authority- can be announced as illegal by national governments
Improves customer experience	Public blockchains might compromise your personal data that can be viewed by strangers
No physical or political boundaries	Huge popularity may attract cyber attacks

Conclusion

The future of innovation can be based on blockchain system, especially for the BFSI (banking, financial services and insurance industry). Since inception, its users have grown exponentially. Various developmental and research projects are carried on worldwide to implement this technology and extract gains of quickness in processes, cost cutting, wide range of services, improved customer experience etc from it. The demand for inexpensive, transparent and secure data systems looks fulfilling after the emergence of this concept. But the need for linking it with cloud computing or other such platform is there so as to resolve the issue of storage space lacking in user's device. However, for its use, one has to set up huge costs to upgrade infrastructure, aware people and educate them about its use, extensive research for implementing this technology as per needs of different users. We need to keep in mind certain things in order to run everything effectively and smoothly. First, prepare one for the potential attacks that are on their way attracted by huge popularity of this system. Second, we need to find out ways through which we can deal with huge volumes of data that will be generated as a result of distribution of multiple redundant copies of records to all nodes that join the network.

The future of blockchain holds immense opportunities provided they are rightly implemented. This has the power to reform and innovate wide variety of sectors and the required work in that direction has already been started.

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Scope of Rural Insurance in India

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The purpose of this research is to understand the hidden potential of rural insurance in India this has been done by initially studying the current trends of rural insurance and various constraints limiting the scope of it then discovering various measures taken by the government and IRDAI to uplift it by framing required regulations and launching various schemes. After studying, it has been clearly revealed that rural insurance is a huge untapped market with a great hidden potential and if tapped properly by applying various feasible measures it can eliminate various social and economic issues such as suicides, poverty, rural development, etc.

Keywords- Rural insurance, agriculture insurance, micro insurance, rural and Social Sector Obligations

Introduction

Agriculture is considered to be the backbone of the Indian economy. It provides a means of livelihood for more than 60% of India's population. Indian farming is heavily dependent on weather and suffers great losses every year due to extreme weather. This dependency gets further increased due to the lack of proper irrigation facilities and modern farming techniques The Agricultural insurance is one of the methods by which farmers can stabilize their farm income by safeguarding themselves in case of bad weather. All these assets needed to be insured from damage/loss whether natural or manmade. Thus, the rural areas offer a huge opportunity for dedicated private insurance companies in both life and non-life.

While it is an untold truth that insurance cover depends largely on the literacy/awareness levels and confident income, well-planned and organized efforts by committed private sector companies can get rich surpluses from the rural areas .Also, now being the insurance sector open to the private players and various foreign companies, the Government of India should pay serious attention towards rural areas. Thus, making a direct impact on the country's economic growth through agriculture development

Literature Review

A Study on Rural Insurance in IDBI by DevanshuDivya (June 2013) -The research was done to determine the specific marketing techniques that can be used for wider insurance coverage. Therefore, this study analyses the existing rural insurance market and various existing marketing techniques that are being used and henceforth suggesting suitable methods for a wider insurance coverage.

Penetration of Life Insurance in Rural India By D.C. Khansili (March 2016) -The purpose of this paper was to understand the various attempts by private Life Insurance Companies in reaching out to Rural Insurance. Also seeing the initial encouragement by IRDAI to fulfil various rural and social sector obligations and lately on a volunteering basis.

Agricultural Insurance in India Problems and Prospects by S. S. Raju and Ramesh Chand (March 2008) -Enormous insurance potential exists in agriculture insurance there is just a need to enhance the overall efficiencies. The objectives were to estimate the price of risk involved in various crops at all levels, to understand the various problems and prospects of agriculture insurance. And to see the role of government and various other entities in the development of insurance and suggest various solutions that can mitigate the adverse impacts that can happen on the individual farmers.

A Case Study of Rural Development Programmes in India By Farooq Ahmad Ganiee (Feb 2014) -Rural development refers to a procedure to improve the quality of life of individuals living in rural areas that are living in isolated and sparsely populated areas. The paper was based on the secondary data, and attempts were being made to study and understand different development effort to rebuild the rural life on the basis of various secondary data.

Agricultural insurance in India-a perspective by Dr A. Amarender Reddy (February 2004) -The study was focused on the National Agricultural Insurance Scheme, the first successful rural insurance scheme that assures millions of farmers whose livelihood depends on the rain. However, there were some major problems with the scheme. This paper aims to discover the pioneering techniques in rural insurance that can overcome these disadvantages

Objective of The Study

1. To study the present rural insurance scenario

2. To study different measures by the IRDAI, government and insurance companies to uplift and promote rural insurance

3. To discover the hidden potentials in rural insurance

4. To understand the complexity of rural insurance and feasible measures for improvement

Data Collection

Data was collected from multiple sources such as books, journals to understand the rural insurance industry. In this paper, I have referred to previous research articles. Apart from this, I have visited different websites and professional magazines. The secondary data has been collected from various government sites and its bodies and being analyzed and to try to solve various constraints of rural insurance and what possible measures can be taken to solve those constraints.

Data has been collected from –

1. Finatcimraipur (18-Sept-2016) Rural Insurance in India untapped

2. Pan (11-Jul-2003) News clip about recent rural insurance scenario

3. Doc player (15-Aug-2018) Risk and risk management of rural insurance

4. Doc player (18-Dec-2016) Agriculture insurance in India problems and prospects

5. Cridia (05-Oct-2013) CRDIA is an institute under the Indian Council of Agricultural Research.

6. Agri education (24-Oct-2015) Knowledge about Agriculture

7. Chhikara K.S and A.S Kodan, "National Agriculture Insurance Scheme (NAIS) in India: An assessment"

8. Agri education (20-Jul-2018) Knowledge about Agriculture

9. Unpan1 (24-Apr-2012) Knowledge about various regulations

10. Actuaries India.org (23-Oct-2011) Rural Insurance presented in conference of actuaries

Findings

Rural insurance generally refers to insurance related to rural people, their business (farming, cattle, poultry, etc) and their family. Microinsurance and agriculture insurance are part of rural insurance. According to the IRDA, the Rural sector can only be defined as such only has a population of less than 5000, its density should be less than 400 per square kilometre and least of 75% of the male population occupied in agriculture-related works. India has diverse customers spread of 638,635 villages in which is nearly 72% of the Indian population lives. In most of the states, the rural population is higher than the urban population as seen below in the graph
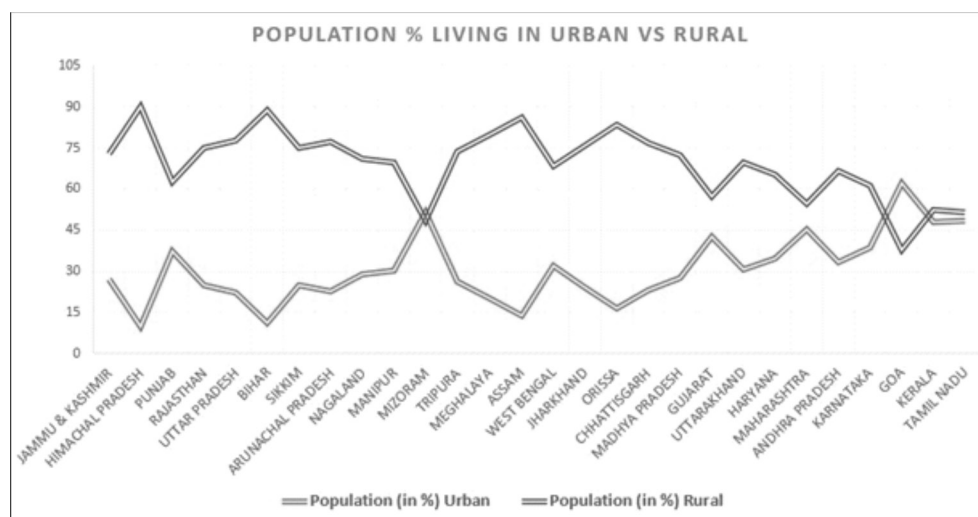
(Source - https://en.wikipedia.org/wiki/Demographics_of_India)

Majority of the rural population in India is involved in farming sector either directly or indirectly (farming, marginal farming, marginal land labourers etc.) and rest of skilled labourers and various artisans like carpenters, masons and small-scale shop owners.

Despite the substantial increase in the last ten years, the coverage in rural and social areas continues to be inadequate, if compared with the overall potential. Thus, clearly indicating a need for rapid expansion. The major role that can be played by insurance programmes to cover risk adversely affected by natural weather and other potential problems. Insurance can help individuals to engage in risky activities that can help to generate greater revenue which they would not undertake otherwise.

Due to the absence of formal risk-sharing mechanisms, Indian farmers rely on traditional methods to deal with risk in agriculture. Many cropping strategies and farming practices have been adopted since independence to stabilize crop revenue. The risk-bearing capacity of an average farmer in the semi-arid tropics is very limited. A large farm household or a wealthy farmer is able to spread risk over time and space in several ways; he can use stored grains or savings during bad years, he can diversify his crop production across different plots

Constraints

- Designing appropriate and sustainable products (from the insurer's perspective), with limited or imprecise data and calculating the risks of frauds, adverse selection, and moral hazards is a very difficult task for actuaries

- Minimizing various distribution costs, this involves tapping into the distribution infrastructure which is either unavailable or unreliable.

- Establishing offices in the regional area with a required manpower can be a difficult task especially for private insurers and training of micro-agents can also be a big challenge.

- Explaining the relatively complex products work to overcome understanding while removing trust barriers among the rural clients is a very challenging task especially to uneducated.

- Ensuring those who buy the product have a clear understanding of what is covered and what is not in their local language and not losing the trust while explaining these terms and conditions.

• Many of the Indian farmers earn seasonally and making specialized products for those farmers with solving the liquidity constraints is still a challenge.

• Retention of trust of farmers who may not have received a pay-out for years and still paying a regular premium with the promise of compensating them when required as promised.

Efforts by Government for Upliftment of Rural Insurance

• National Agricultural Insurance Scheme" (NAIS) or "Rashtriya Krishi Bima Yojana" (RKBY) was the first successful scheme in India set up in the year 1999-2000 after failing of many schemes. It included coverage of all food crops (both horticultural and commercial crops) and oilseeds.

• The Agricultural Insurance Company (AIC) was set up in December 2002. AIC has taken over the operation of National Agricultural Insurance Scheme (NAIS) and commenced its business from 1st April 2003

• AIC transacts all the rural insurance schemes in India and many other insurance businesses either directly or indirectly related to rural and agriculture insurance.

• There is a total of 13 Products in AIC with, main ones being Pradhan Mantri Fasal Bima Yojana (February 2018) and National Agricultural Insurance Scheme (2000).

• AIC is also planning of introducing 5 more such schemes related to rural and agriculture insurance namely-

• Sugarcane Insurance

• Tea Insurance

• Basmati Rice Insurance

• Aromatic & Medicinal plants Insurance

• Contract Farming Insurance

• In the year fiscal year 2016-17 total amount of Rs. 16,66,316 lakhs have been paid covering 1,48,01,872 farmers (Source: Annual report AIC 2016-17)

Initiatives by Irdai

All the insurance companies are mandated to follow social and rural regulation by IRDAI under section 32B and section 32C under insurance act 1938. These regulations were a major step in rural insurance. IRDAI has also amended Micro Insurance regulation in the year 2015, giving the approval to launch various products helping low-income people. The first regulation was in the year 2005 which was modified later.

Rural and social sector obligations

First regulation was in the year 2000 and since then it has been modified according to the changing environment. The current regulations are as follows -

Life Insurer has to do the following percentages of the total number of policies written in respective years

Sl. No.	Financial Year from Inception	Percentage of number of policies
1	First year	7
2	Second year	9
3	Third year	12
4	Fourth year	14
5	Fifth year	16
6	Sixth and seventh year	18
7	Eighth and ninth year	19
8	Tenth year and every year thereafter	20

General Insurer has to do following percentage of gross premium income while standalone health insurers has to follow 50% of the obligation

Sl. No.	Financial Year from Inception	Percentage of gross premium written direct
1	First year	2
2	Second year	3
3	Third year to seventh year	5
4	Eighth year	6
5	Ninth year and every year thereafter	7

Apart from the above regulations, every insurance company needs to fulfill these social sector regulations

Age of the Insurer in years	Percentage of Social Sector lives computed on the total business procured in the preceding financial year**
1	0.5
2	1.0
3	1.5
4	2.0
5	2.5
6	3.0
7	3.5
8	4.0
9	4.5
10 and above	5.0

Source – www.irdai.gov.in

Insurance companies also charge penalties to insurers under section 32B for failing to comply with the provisions of rural obligations, a penalty of not exceeding 5 lakhs shall be charged. Similarly, under section 32C penalty not exceeding 25 lakhs shall be charged if social regulations are not met.

IRDAI have charged 11 insurance companies (8 General and 3 Life) till date for not fulfilling their social rural sector obligation under the section 32B and 32C of Insurance Act, 1938

Tata AIG General Insurance Company and New India Assurance even filled a plea disbanding their penalty for their respective year but IRDAI clearly refused their petition and levy a penalty of Rs.5 lacks and 10 lacks respectively.

List of all the penalties charged so far

General Insurance Companies		
Date	**Insurer**	**Penalty**
10-09-2007	New India Assurance	Penalty of 5 Lakhs
20-03-2009	National Insurance	Penalty of 5 Lakhs
20-03-2009	New India Assurance	Penalty of 5 Lakhs
20-03-2009	Iffco Tokyo General	Penalty of 5 Lakhs
24-06-2009	HDFC ERGO General	Penalty of 5 Lakhs
07-01-2010	Apollo Munich Health	Penalty of 10 Lakhs
19-07-2010	Tata AIG General Insurance	Penalty of 5 Lakhs
07-06-2011	New India Assurance	Penalty of 10 Lakhs

Life Insurance Companies		
Date	**Insurer**	**Penalty**
10-09-2007	Shriram Life	Penalty of 5 Lakhs
07-01-2010	LIC of India	Penalty of 5 Lakhs
07-01-2010	HDFC Standard Life	Penalty of 5 Lakhs

Source - https://www.irdai.gov.in/

Source - https://www.irdai.gov.in/

Micro insurance Regulations

Microinsurance refers to the protection of low-income group of people against specific perils in exchange of regular premium to cover health insurance, life insurance, cover for belongings such as, hut, livestock, personal accident (either individual or group basis), etc. with a maximum of Rupees one lakh sum assured for a period of one year.

Micro-life insurance segment for the year 2016-17 stood at 38.22 crores under 9.56 lakh new policies, the group premium amounted to 460.43 crores covering 3.22 crore lives by 35200 micro insurance agents. (Source: IRDAI annual report 2016-17)

There are a total of 35,200 life microinsurance agents 21.7% from NGOs form 21.7%, 1.1% from Self Help Groups (SHGs), 1.0% from Micro Finance Institutions (MFIs), 0.2% from Business Correspondents and remaining 75.9% from insurance agents. (Source: IRDAI annual report 2016-17)

There were 28 life microinsurance products (18 individual and 10 groups) sold from 17 life insurers. (Source: IRDAI annual report 2016-17)

There are in total of sixty general insurance products available in the market offered by different insurers. There is a total of 35,065 micro insurance agents (private – 2,771 and public – 32,294). (Source: IRDAI annual report 2016-17)

Other Hidden Potentials Indicating Scope of Rural Insurance

India has the second largest population in the world with the second-fastest population growth in the world which has the highest GDP growth rate, an average of 7% pa. This Cleary evidences that India will require insurance as a bodyguard or backbone of the economy. As we all know that the rural population in India is more than the urban population. Hence in order to safeguard the economy, it is necessary that rural insurance should be more focused than the urban insurance.

(Source - https://www.livemint.com/)
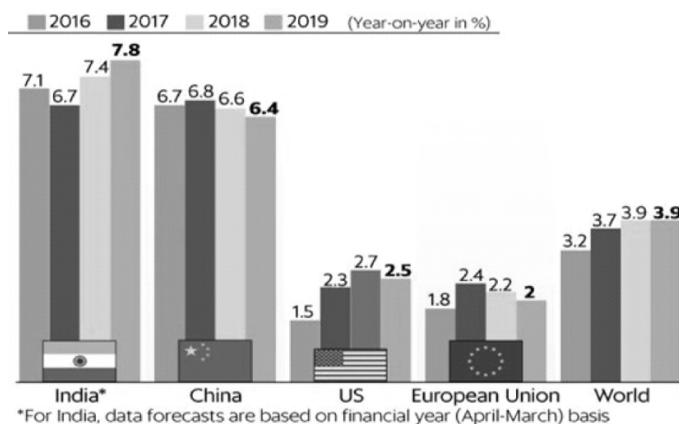
India has a literacy rate of 74% (2011 figures) with a rural literacy rate of 71%.It can be observed that both urban and rural literacy rate have an almost the same growth rate in literacy in the past two decades. Clearly indicating that in future India's both rural will be highly educated in the near future and it would increase the selling of insurance since they already knew already insurance, its products and its benefits.

(Source -https://thelogicalindian.com)
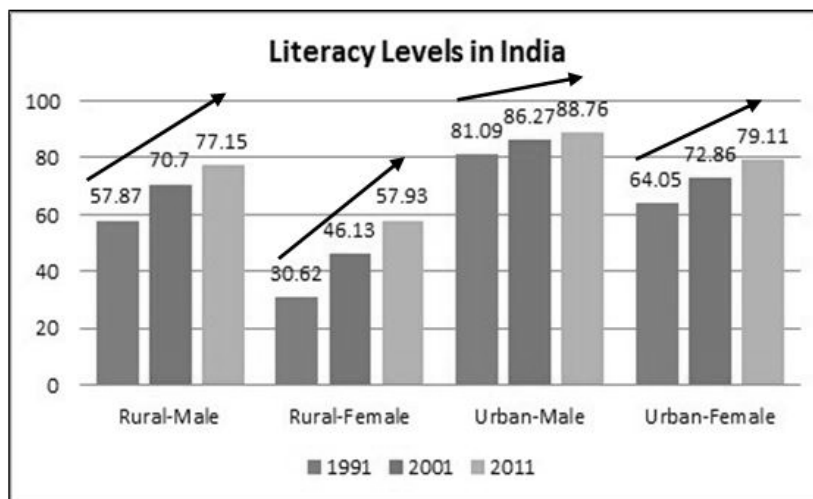
India is one of the most favorable foreign direct investments in the world because of its rising economic growth rate and huge population. IRDAI has also changed FDI regulation from 26% in the year 2000 to 49% in the year 2016 and this has resulted in resulting in huge capital investment, more competition with better products with a low premium rate in all. This will enable insurers to capture the rural market using their huge capital.

The main reason for farmer's suicide in India is due to failure of crops. India has different terrains and weather, the weather is highly unpredictable and due to improper or unavailability of irrigation facilities, it is even harder for small farmers to survive. Rural Insurance can provide the support and the financial aid to farmers if their crops fail and can

Recommendations

Various exhibitions, slide shows, short films and other such activities should be organized to aware people about the concept of insurance.

Knowledge of IRDAI and its role should also be given to building the confidence of people in insurance and insurance companies.

In order to maximize customer service, companies need to aware people about the nearest service centre with a valid phone number where they can resolve any of their problems.

Printing policy bond in regional language and communicating in regional language avoiding insurance jargons and helping build trust and confidence in insurance.

Insurance companies are advised to survey the rural market to understand the need and design of need-based products. A family policy, covering all members can also be launched in order to cover maximum people in a single policy.

New agents are to be appointed and trained in villages since local members have inbuilt trust in that agent.

Companies can also launch individual or group plans to cover loans taken by the poor people and protect their solvency.

The life insurance companies can collaborate with various cooperative societies for selling insurance to all of their members and some commission can be paid to those co-operative societies.

Insurance companies need to design policies with daily or weekly premium collection mechanism that would enable daily wage workers to purchase insurance.

Insurance companies should start giving cash rewards points for each repeat purchase which can be redeemed during claim by way of maturity or death.

Due to lack of proper financial services Insurance companies can look at to collect premium through mobile vans at the village markets

The life insurance companies can tie up with all regional and cooperative banks to sell bancassurance and can reward bank managers for selling the insurance. Insurance companies should launch easy to understand bank assurance products.

Various insurance companies can have a special rural vertical department at the corporate office for successful implementation of all rural social objectives and capturing the untapped market.

Establishment of a National Insurance Academy for the specified training of rural agents of rural areas should be established by IRDAI with a collaboration of all insurance companies.

Companies can issue credit cards to rural policyholders and provision can be made for paying premiums through credit cards.

Insurance companies could develop the data of each village with various parameters such as income, occupation, family, etc. which would help in the recruitment of agents, designing better products, and many such benefits.

Commissions that are traditionally paid to an agent can be paid to the villagers if they recommend a policy to their friend or family in order to create a win-win situation and reap the benefits of affiliate marketing.

IRDAI can increase the rural and social regulations since most of the companies are able to fulfill it quite easily. Several awards by IRDAI can be introduced such as most unique product, most lives insured, etc.

Conclusion

Rural India is the next big opportunity in India. The diverse customers spread through thousands of villages spread across the 29 states and 7 union territories of India presents a great untapped opportunity as more than half of the second largest population country resides in these areas.

Despite several initiatives by the government to promote rural insurance, it has remained a small part of the total market. Most insurance companies still see rural business as an obligation rather than an opportunity, especially private ones.

It's time for companies to see this untapped market as an opportunity rather than obligations. There are many challenges that needed to be solved in order to cover this huge untapped market.

Rural Insurance will also help India to remove the cascading effects of poverty, unemployment, and inadequate infrastructures in rural areas. Hence the development of 60 % of India's population. This will make India, a country with the lowest or no suicides of farmers due to any reason.

India still has miles to go before achieving this target, but with adequate planning and organizing and with adequate government support this is a target should be achievable probably in the next decade.

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Emergenceof India as a Global Reinsurance Hub

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The Indian reinsurance market, after having been thrown open to the foreign players in the recent past, is all set to witness tough competition with almost a dozen of global players, entering the field which has been till now dominated by a sole player -GIC Re. Until 2016, GIC Re was retaining a portion of the risks and the rest was being passed on to the rest. But now global reinsurers are having a closer scrutiny of the risks and price it appropriately.

Key words: Reinsurance, Reinsurance hub, insurance, insurance amendments,

Introduction

Reinsurance refers to risk cover taken by insurance companies against large risks that they underwrite. General insurance companies take majority of the reinsurance in the country and life insurance constitutes a small chunk of the overall business in the country. The GIC was established in 1972 under a statute as a solely owned company of the government of India, along with four subsidiaries, which together operated the general insurance market in India. Pursuant to the liberalization of the Indian insurance sector in 2000, the GIC was made India's sole reinsurer (known as GIC Re) in order to address more efficiently the reinsurance requirements of the growing insurance market in India.

As per the provisions of the Insurance Act, 1938, the "Indian re-insurer/s" are entitled to receive obligatory cessions as decided every year, from all the General insurers and Health Insurers. The limits are notified every year, based on the recommendations of the Reinsurance Advisory Committee with the approval of Government of India. Since January 2017, it is mandatory on the part of Indian insurers to follow the "order of preference" duly suggested by the Insurance Regulatory and Development Authority of India (IRDAI) while approaching the reinsurance market. According to the earlier practice, Indian insurers were free to approach any of the cross-border reinsurer registered with IRDAI to meet their requirement of reinsurance, subject to mandatory cessions to GIC Re.

Literature Study/Review

As the developments in the Insurance industry vis a vis reinsurance have taken place very rapidly in the recent past no research has been conducted on this topic during this period. The author has gone through the recent amendments bills, draft of upcoming bills, revised Reinsurance regulatory framework, reports and reactions published in the leading newspapers and journals, deliberations on various forums.

Objectives of the study

• To highlight the important changes taking place in the Indian Reinsurance market;

• To analyze the current amendments in reinsurance;

• To make critical assessment of Government policies for the global reinsurance players;

• To evaluate the response of the global players to these initiatives;

• To study the impact of latest initiatives and developments;

Reinsurance Market in India

As per the rules, every Indian insurer must cede a certain percentage of the sum insured/ risk assumed on each policy for different classes of insurance written in India to the GIC, as per the Insurance Act 1938. Although Indian insurance companies are bound to cede at least the mandatory percentage as prescribed, however in practice, an offer must be made to the GIC Re and the Indian sole reinsurer may accept the offer in whole or in part. The size of the Indian non-life insurance market, which is more reinsurance intensive as compared life insurance, was to the tune of ₹1.26 lakh crore (also known as Gross Direct Premium Income) in last financial year (2017-18). Out of this total premium, nearly ₹28, 900 crore was cede (given out) as reinsurance premium and out which ₹11,000 crore was transmitted to overseas reinsurers - CBRs.GIC Re, which has a dominant 60 per cent market share, has been supporting the Indian market, even though primary market prices are low, whereas the foreign branches have been choosy and accepting the best risks in terms of quality and loss experience referred to them by Indian insurers.

Reinsurance Regulatory Outline

The regulatory framework governing the reinsurance of non life insurance risks in India was initially governed by the IRDA (General Insurance-Reinsurance) Regulations 2000, which were superseded by the IRDA (General Insurance-Reinsurance) Regulations 2013. Thereafter the government has taken some more initiatives to bring drastic changes in insurance and reinsurance market which are elaborated hereunder:

1. The Insurance Laws (Amendment) Bill, 2015

According to the Insurance Bill 2015, passed by both the Houses of Parliament, foreign reinsurers are permitted to engage in re-insurance business in India directly or through branch offices after having been registered with the IRDAI. Earlier, reinsurance companies were permitted to operate as a joint venture with 26 percent cap on foreign direct investment. The amended law also defines're-insurance' to mean "the insurance of part of one insurer's risk by another insurer who accepts the risk for a mutually acceptable premium", and hence excludes the possibility of 100% cession of risk to a re-insurer.

The Insurance Law (Amendment) Act, 2015has allowed foreign reinsurers and Lloyd's to open their branches in India to transact reinsurance business in India. In addition, IRDAI has also allowed insurers to open their offices in International Financial Services Centre, Gujarat-SEZ, thereby enabling them to transact reinsurance business in India. It also enables Lloyds and its members to function in the Indian Territory through setting up of branches for conducting reinsurance business or as investors in an Indian Insurance Company with 49% cap. The Bill helps reinsurance business evolve in India as highly experienced reinsurers are coming to India as foreign branches.

2. IRDAI (General Insurance-Reinsurance) Regulations 2016

The passage of the Act (Amendment) Bill, 2015 set the stage for the amendment of these regulations, and in 2016 the IRDAI published the IRDAI (General Insurance-Reinsurance) Regulations 2016, which superseded the earlier reinsurance regulations. The Insurance regulator has notified the Reinsurance Regulations applicable to General Insurers in 2016. It requires that every insurer shall have a comprehensive and efficient re-insurance program with major objectives of maximizing retention within the country, developing adequate capacity, securing best possible reinsurance protection. This is important in order to maintain the solvency of all the insurance companies.

Indian insurance companies are strictly prohibited from fronting for a foreign reinsurer. While certain clear instructions regarding retention limits by life insurers have been provided under the Life Reinsurance Regulations 2013, the IRDAI has not issued explicit guidance on the minimum amount of retention by general insurers. It is also worth noting that Indian direct insurers, Indian reinsurers and foreign reinsurer branches can carry out reinsurance business outside India only with foreign insurers and reinsurers (cross-border reinsurers) that satisfy the eligibility criteria (i.e., have a minimum credit rating of 'BBB' from Standard & Poor's or equivalent credit-rating agency and are registered in India). Generally, the maximum limit on cessions to cross-border reinsurers applicable to insurance branch (segment) is prescribed and is based on the cross-border reinsurer's rating.

3. IRDAI (Reinsurance) Regulations, 2018 (Draft)

The IRDAI has issued the draft IRDAI (Reinsurance) Regulations, 2018 (the Draft Regulations) on 05 January, 2018. The draft regulations have sought to bring out significant changes to the existing regulatory framework/ regulations relating to reinsurance particularly with reference to the categories of reinsurers, order of preference, retention limits, etc.The Draft Regulations have been issued considering the recommendations made by the Expert Committee on Reinsurance headed by M Ramprasad, former member,IRDAI which was constituted by IRDAI. The Draft Regulations were proposed to come into effect from 1stApril, 2018.

"Insurance Regulatory and Development Authority of India (Reinsurance) Regulations, 2018" inter-alia, includes following:

1) Cross Border Reinsurer (CBR):

No Indian Insurance company will be allowed to place its reinsurance business with any CBR, which does not satisfy the following eligibility criteria: –

a) The CBR must be a legal insurance or reinsurance entity in its home country, regulated and supervised by its home country regulators for past three continuous years.

b) The CBR must have a minimum credit rating of BBB (from Standard & Poor) or comparable rating from an international rating agency for immediately preceding three years.

c) The home country of the CBR must have signed so called 'Double Taxation Avoidance Agreement' with India.

d) The CBR has solvency margin not less than as stipulated by the home country regulators for the past three yearsincessantly.

However, after getting the feed-back from the insurance industry, IRDAI is yet to unveil the final norm which is now overdue.

2) Procedures for reinsurance placements:

a) **Obtaining best terms for Cessions:** (A) Every cedant shall obtain best terms for its reinsurance coverage requirements at least from (i) Indian Reinsurers who have been transacting business for not less than 3 years continuously, (ii) at least three from FRBs. (B) In case of non-receipt of response from the above entities and for commercial reasons, the cedant may obtain best terms for its reinsurance protection requirements from either IFSC Insurance Office (IIOs) of foreign insurers or reinsurers transacting reinsurance business and having credit rating of A- from S&P or equivalent; or CBRs with credit rating of A- from S&P or equivalent rating from any other international rating agencies.

b) **Offer for Participation:** Every Cedant shall offer best terms, for participation in the following order of preference:

   i. to Indian Reinsurers who have been transacting business for not less than past 3incessant years and then to other Indian Reinsurers;

   ii. Branch office of a foreign reinsurer (FRBs) and thereafter to the IIO or CBR which provided lead terms with significant capacity of not less than 5% for treaty reinsurance business and 10% for facultative reinsurance business;

   iii. to IIOs, other than those as at (ii) above, which are transacting reinsurance business and other Indian Insurers;

   iv. to CBRs, other than those as at (ii) above.

   1) Cession limits:

Reinsurance placements shall besubject to the following overallcession limits, which can be madeby a cedant to any particular CBR.

Rating of the CBR from Standard & Poor or equivalent Rating agency	Overall limit of all cessions of the ceding company with a particular CBR
Greater than A+	20%
Greater than BBB+ and up to and including A+	15%
BBB & BBB+	10%

4. Domestic Insurance Pools:

The proposals for an Insurance Pool could be initiated by any of Indian insurer and IRDAI may permit formation of domestic insurance or reinsurance pool(s) based on the proposal submitted with it. These pool arrangements and their reporting will be as per the IRDAI's directions.

Initiatives for Expanding Reinsurance in India

The IRDAI on 30th June, 2016 approved the initial license -known as R1 in regulatory parlance - to ITI Re. GIC Re has been the country's sole reinsurer so farin the $3-billion Indian reinsurance market and foreign reinsurers have liaison office in India. In the process of expanding reinsurance in the country, IRDAIin Dececmber,1916,permitted the R3 application and granted certificate of registration to five global reinsurers. Thusthe leading reinsurers - Munich Re, Swiss Re, Scor, Hannover Re and RGAgot the final licence.

As per the IRDAI's norms, a foreign reinsurer must get three levels of licences from the regulator to commence operations and a few of them have already got R1 licence and are waiting for R2 and R3. The R3 is the final stage of approval from the regulator to commence operations in the country as foreign branch offices. IRDA is of the opinion that with the clearance to opening of branches of foreign reinsurance players, domestic insurers will be able to underwrite much more risks and will be able to manage their capital more efficiently.

Response from Global Players:

Several Global re-insurers, who have received final approvals from IRDAI, have started doing business in India through their offices (off shore) and have an exposure of over $1.6 billion in the Indian markets. Some of the prominent global reinsurers - Munich Re, Swiss RE, Hannover Re, Lloyd's, RGA, XL Catlin, and Gen Re - have already received the requisite IRDAI's approvals. According to an official, the nine playersare poised for pumping in to the tune ofRs 5000 crore to start their operations.All these companies have almost accomplished the process of firming up teams of professionals to commence operations in India. Swiss Re, Munich Re, and Lloyd's have already commenced operations in India.

SCOR, one of the five largest global reinsurance companies has already started its operations in India. "Receiving the license from the Indian Regulator to establish a SCOR branch in India marks a milestone for the group in terms of solidifying its presence in the country, where it has enjoyed strong business relationships for many years." Victor Peignet, SCOR's CEO Global P&C, said. According to him, SCORanticipated the P&C Indian insurance and reinsurance markets will, by all probability, continueto grow at 15 per cent in medium-to-long term.

As the Indian insurance sector is expected to register a good growth with an average annual growth rate of 8 to 10 percent from 2017 to 2025, Swiss Re is among the first five foreign reinsurance companies to obtain a license to conduct reinsurance business in India. Swiss Re's newly licensed entity, Swiss Reinsurance Company Ltd, India Branch, has already begun its operation effective from 1 February 2017.

Lloyd's of London, inaugurated its Mumbai officeon 5th April, 2017with insurer MS Amlin being the first syndicate member in India.The 328-year old Lloyd's, operates as a marketplace where several syndicate members or insurers provide reinsurance service. As mentioned earlier, laws were amended in India (through Insurance Bill 2015) to enable Lloyds to operate as a marketplace which means, unlike other reinsurers, Lloyd's has started operations in India through its market model in which a number of members collectively come together to underwrite and provide reinsurance service.

While inaugurating the Mumbai office, the UK Chancellor, Rt Hon Philip Hammond MP, said that Lloyd's would help Indian insurance companiesupsurge the resilience of the economy to catastrophic events and boost Britain's ties with one of the world's fastest growing and most exciting economies.

John Nelson, chairman of Lloyd's says "We are grateful to the Indian government and authorities for their support in reaching this point and look forward to working together as the legislation is implemented,".

Following is the list of Foreign Reinsurers Branch / Lloyd's India / Lloyd's India Service Company in India.

S . No.	Name of the Foreign Reinsurers Branch / Lloyd's India / Lloyd's India Service Company in India.	City
1	Münchener Rückversicherungs-GesellschaftAktiengesellschaft - India Branch	Mumbai
2	Swiss Reinsurance Company Ltd, India Branch	Mumbai
3	SCOR SE - India Branch	Mumbai
4	Hannover Rück SE – India Branch	Mumbai
5	RGA Life Reinsurance Company of Canada, India Branch	Mumbai
6	XL Insurance Company SE, India Reinsurance Branch	Mumbai
7	General Reinsurance AG - India Branch	Mumbai
8	Allianz Global Corporate & Specialty SE, India Branch	Mumbai
9	AXA France Vie - India Reinsurance Branch	Delhi
10	Lloyd's India Reinsurance Branch	Mumbai
11	MS Amlin (India) Private Limited (Service Companies of Lloyd's India)	Mumbai
12	Markel Services India Private Limited (Service Companies of Lloyd's India)	Mumbai

Does India have the requisite potential to become reinsurance hub?

If we want to create a hub you not only need capital but intellectual capital, actuarial capabilities, brokers to analytics etc. Consolidation is going on Indian Government and the Insurance regulator have taken the necessary initiates to liberate and open there insurance market. Over last few years Dubai has become a reinsurance hub after Dubai government created an economic zone, gave liberalization around licenses, and other facilities. On the same lines Indian Government has created International Financial Services Centre (IFSC) in Gujrat near Gandhi Nagar known as GIFT city (Gujarat International Finance Tec-City). The move by all probability will contribute to better regulation and supervision of the financial entities in the City. At present, the financial services provided at GIFT-IFSC involves several regulatory bodies including insurance regulator, IRDA, banking regulator RBI and stock market regulator SEBI.

Challenges and Opportunities for Operating in India:

How smooth will it be for the global players to operate in India - is billion dollar question. The requisite talent is the biggest challenge. The insurers and reinsurers in the Indian insurance market are required to enhance expertise in certain areas like aviation. According to some insurance experts there are ample opportunities but dearth of knowledge. While pricing is another a challenge in India, reinsurers are anticipating a market correction driven by a reduction in investment income. The task assumed by the insurance regulator to formulate the best possible order of preference for the next few years is quite a complex job, as a fine balance has to be struck and maintained between the practical difficulties faced by insurers and freedom of choice they may have.

Scope of the Study

• As this paper deals with the latest amendments of the government that provides a base for other researcher to conduct research.

• This paper provides valuable input for various players who are willing to land in reinsurance space.

• Through this paper insurance companies and other professional can conduct micro research paper

Limitation of the Study

• In absence of sufficient primary data on the topic the author has restrained from analyzing the comparative study of the past and future scenario.

• As the global players have just commenced there reinsurance business under the new regulatory framework no analysis has been done about their initial performance.

• The duration of the new emerging scenario is not enough and hence this has restricted conducting research in wider area.

Conclusion

The present government is making all concerted efforts to see that India grows as global reinsurance hub and IRDAI is the main catalyst in this government endeavour as indicated by an official of the authority. In the last two years a number of drastic and important changes have taken place in the insurance and reinsurance industry through a number of insurance bills. With almost a dozen of global players in India, foreign reinsurers are looking forward to India becoming a reinsurance hub. IRDA's 2018 (the Draft Regulations) which have sought to bring out significant changes to the existing regulatory frameworkseeks to ensure a level-playing field for foreign and Indian reinsurers while safeguarding interests of Indian firms

.The proposed regulations also provide for placing business with CBRs who have a minimum A-rating. It is expected that a CBR can successfully do a business as much as an India based reinsurer can, if their quote is deemed as the best by the concerned insurer. The insurer has the right to allocate shares rewarding all on their merits, including CBR.

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