Institute of Actuaries of India
www.actuariesindia.org

the Actuary INDIA

THE MAGAZINE OF THE INSTITUTE OF ACTUARIES OF INDIA

November 2020 Issue
Vol. XII - Issue 11
Pages 32• ₹20

INDIAN ACTUARIAL PROFESSION
Serving the Cause of Public Interest

MARSH

Make an Impact:
From Risk to Resilience

Marsh is a global leader in insurance broking and risk management.
We have more than 30,000 colleagues working together to serve our clients in more than 130 countries.

To know more visit: https://www.marsh.com/

	Analyst	Specialist	Senior Specialist
Qualification	A degree in Statistics/Mathematics/Actuarial/Computer Science/Engineering		
Actuarial Exams	**4 to 6** Preferable papers (CS1, CS2, CM1, CM2)	Completed at least Core Principle level exams	Completed at least Core Principle level exams. Preferable papers (CS1, CS2, SP7, SP8, SA3)
Experience	0-2	2-4	4+ years of experience in P&C Actuarial

WHAT IS IN IT FOR YOU?

- You will work within the Analytics Solutions team of Marsh Advisory.
- Perform and develop a wide variety of financial and statistical analysis to help Marsh's clients quantify the risks. Help clients how best to protect themselves against those risks.
- A clear career path with a hybrid of technical track and management track to grow in the company.
- Will develop specialties in Predictive Modelling, Commercial Pricing, Stochastic Modeling, CAT modelling, Reserving, ERM and Non-traditional actuarial work.
- Will have access to Marsh tools and proprietary Risk Quantification models (eg. Cyber, Property, Directors & Officers Liability, Environmental Liability).

HR Contacts:
dharati.khanna@mmc.com
rupal.saxena@mmc.com

Marsh McLennan Global Services India Private Limited (formerly known as Jardine Lloyd Thompson India Private Limited) is a part of the Marsh & McLennan Companies (MMC) group of companies.

MARSH & McLENNAN COMPANIES

the Actuary INDIA
www.actuariesindia.org

CONTENTS

"A noble man's thoughts will never go in vain. -Mahatma Gandhi."
"I hold every person a debtor to his profession, from the which as men of course do seek to receive countenance and profit, so ought they of duty to endeavour themselves by way of amends to help and ornament thereunto - Francis Bacon"

ENQUIRIES ABOUT PUBLICATION OF ARTICLES OR NEWS

Please address all your enquiries with regard to the magazine by e-mail at library@actuariesindia.org.
Kindly do not send it to editor or any other functionaries.

Printed and Published monthly by Vinod Kumar Kuttierath, Head of Education and Training, Institute of Actuaries of India at PRINT VISION, 75/77, 1st floor, Punjani Ind. Estate, Near Abhishek Hotel, Khopat, Thane (W) 400 601, for Institute of Actuaries of India L & T Seawoods Ltd., Plot No. R-1, Tower II, Wing F, Level 2, Unit 206, Sector 40, Seawoods Railway Station, Navi Mumbai 400 706
Email: library@actuariesindia.org, **Web:** www.actuariesindia.org

For circulation to members, connected individuals and organizations only.

From Chief Editor's Desk

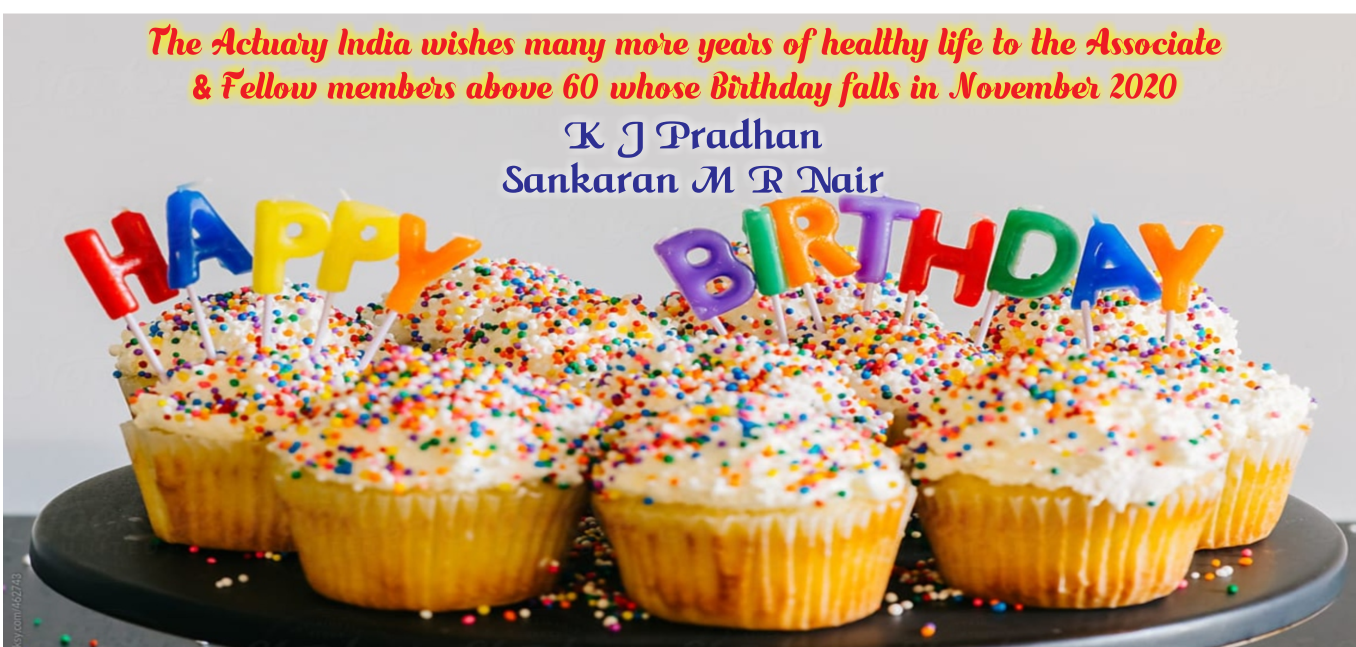
Ms. Bhavna Verma

This is my last write up of 2020; the year that has clearly earned its place in history as "The year the world changed". Despite most of it spent in lockdown, the year has again flown by however not without imparting numerous life lessons for which I will remember this year with bittersweet emotion. Prayers for those who departed due to the pandemic and those who were distressed due to its economic impacts. The pandemic has had contrasting impacts on different industries, the worst hit clearly being travel and tourism, hospitability, real estate among others. I believe actuarial techniques and skills, on the contrary, gain more prominence in this new normal where the universe of risks, both foreseeable and tail events has widened and may expand even more. With some initiative, several new opportunities can open up for actuaries during this transitional phase.

I would refrain from predicting what 2021 might bring along but one thing I do hope is that it brings more features contributions to the Actuary India magazine, which represents the actuarial profession in India. We are also looking to build an energetic editorial team for the magazine that will be actively involved with exploring themes for the magazine, developing content, liaising with authors, and basically putting their heads and hands together to make the magazine more vibrant and comprehensive. So whether you are a young student or an actuary with several years of experience who would enjoy being in the midst of such action, please email us with an expression of interest and brief profile. It is a great volunteering opportunity and I hope to see positive response from members of the actuarial community.

There is an interesting line of webinars scheduled in the month of December. I don't know about the rest of you but I am certainly enjoying these new format short webinars which one can fit into a work day. Let's close the year with some good learning, gratitude for all we have and new hope for the new year!

Please continue to send in your articles and suggestions at library@actuariesindia.org.



From President's Desk

Mr. Subhendu Bal

Dear Members,

By the time this issue of the Actuary India reaches you, the new year 2021 would have spread its wings with HOPE. My good wishes for 2021 with the hope that entire world attains normalcy soon. It is also good to note that the vaccination against corona virus is in the sight.

I have pleasure sharing information that IAI undertook many jobs and saw a number of new initiatives during last two months.

Post a miss of summer examination diet in light of Covid-19, IAI conducted first ever Home Based Online November 2020 actuarial examinations successfully. I am also happy to share with you all that we have received very good feedback from the students.

To strengthen the IAI office, IAI wants to complete the recruitments which were pending for some time. We have redesigned the Application Form as a standard format that allows the candidates to apply online for vacancies. IAI conducted few interviews for vacant positions. This was long awaited and I hope that with this addition IAI would perform better and would achieve the set developmental targets.

Strengthening the relations at Government, Regulator, International Actuarial Bodies and Sister Professional Bodies' level is the top agenda of IAI. Meetings were held in the month of November 2020 with the officials of Ministry of Finance, Chairman of Pension Fund Regulatory and Development Authority (PFRDA), International Actuarial Association (IAA) Council Committee, Casualty Actuarial Society (CAS), and I also attended Carribean Actuarial Association annual conference. IAI also conducted special webinar with Institute of Company Secretaries of India (ICSI) in first week of November.

These activities continued in the month of December 2020. In the capacity of IAI President, I was invited as panellist in the discussions on topic titled "The Power of Diversity of Thought" and attended President Town Hall meeting with several Presidents throughout the World.

In order to maintain continuity, another meeting was held with Ms. Tonya Manning, President, IAA and Mr. Mathieu Langelier, Executive Director, IAA on 2nd December 2020.

I also attended Pension Advisory Committee (PAC) meeting of PFRDA on 29th December 2020. To combat the longevity risk is as important as to cover the mortality risk. Hence the role of PFRDA is growing. Actuarial Personnel have been traditionally involved in designing pension plans, its maintenance, investment, accounting, assessing the risks, valuing the liability and arriving at the contribution, education and training, etc and so their role would be appreciated more by the pension regulator by regular interactions.

I had mentioned in my first President Column that compliance with the Actuaries Act and related regulations would be at core. In this line, Grievance Redressal Committee for employees of the Institute was constituted. Now employees with their grave grievances, if any may approach to the Committee and may get natural justice. We have also reconstituted Internal Complaint Committee, with addition of one External Member from a reputed NGO, to be compliant with Section 4 of Sexual Harassment of Women at Workplace (prevention, Prohibition and Redressal) Act 2013. To improve our Corporate Governance and to get the better benefits, I have inducted few co-opted external members to our Section 21 committees, who are very experienced and have expertise in different fields. With this inclusion, I believe, we will be able to perform much better in the Section 21 committees with diversifying expertise. I must thank and welcome all the expert to our Committees.

IAI constituted task force group for accreditation of Universities and the Institute. They would present framework for possibility of equivalent IAI subjects' accreditation of universities and the institutions.

IAI has been fore runner and its views/opinion is being sought on the matter of national interest. IAI provided its views on Social Security Code 2020 and opined on other topics.

A number of webinars are being conducted by various Advisory Groups. These are attracting good number of actuarial professionals. The webinars are not only being attended for CPD purpose but for knowledge also. The webinars are providing comfort to the members particularly to very senior actuarial professionals. I am thankful to Chairs of Advisory Groups and its members for continued support. They are also instrumental in bringing the professionals of international repute.

I close the column with one saying of Brian Tracy – "All that matters is where you are going!"

Pensions, Other Employee Benefits & Social Security

7th Capacity Building Webinar on Retirement Benefits (7th CBRB)

(Online Edition February 2021)

The IAI is pleased to announce a unique platform and webinar on **Capacity Building on Retirement Benefits (7th CBRB) on 5th February, 2021 to be conducted online, as a combined day.**

	Date	Time	Topic
Topic 1	5th February 2021, Friday	11.00 am - 1.15 pm, India time	Code on Social Security, 2020 - Impacts on actuarial valuations for year ending March 2021 time
Topic 2		3.00 pm - 5.15 pm, India time	Data Analytics - Opportunities in Employee Benefits

IAI will be using additional audience participation tools such as virtual breakout rooms and group exercises to bring some of the traditional flavour of the CBRB. Participation is therefore on a first come first serve basis and limited to 80 registrations. Registration deadline is 2nd February, 2021 to allow pre-allocation of groups.

We look forward to bringing you some practical and hands on learning on topical issues in a highly participative and engaging format.

Registrations will only be possible for combined session, along with the CPD credits.

Target Audience for all sessions -IAI members, Auditor, HR, Finance professionals, Non-members. The sessions are targeted at all the professionals who want to join.

Topic 1: Code on Social Security, 2020 - Impacts on actuarial valuations for year ending March 2021

Time: 11:00 am - 1.15 pm

Opening remarks and Instructions
Mr Kulin Patel, Chairperson, Advisory Group on Pensions, Other Employee Benefits and Social Security, IAI
(Members of the Advisory Group will also support in facilitating breakout discussion)

Speakers:
1. **Mr Arpan Thanawala**, FIA, FIAI, Consulting Actuary, Thanawala Consulting Services
2. **Mr Khushwant Pahwa**, FIA, FIAI Consulting Actuary & Founder at KPAC

The Code on Social Security 2020, along with other three codes revamps the labour regulations in the country. The Code on Social Security 2020 (the “Code”), which received the Parliamentary Assent on 23rd September 2020.

The speakers will provide some context to the areas of the code that will impact actuarial valuations of employee benefits ranging from definition of wages, gratuity benefits, future funding implications and impact on other employee benefits. This will set the context to participants participating hands on with sample calculations, contribute to specific discussion questions and have an opportunity to present views to the audience.

Participants will benefit from hearing about the wider context, as well as different interpretations that may exist in the implementation of the Code, thereby helping practioners to advise clients suitably.

Topic/s 2: Data Analytics - Opportunities in Employee Benefits

Time: 3:00 pm - 5.15 pm

Opening remarks and Instructions
Ms. Chitra Jaisimha, Member, Advisory Group on Pensions, Other Employee Benefits and Social Security, IAI (Members of the Advisory Group will also support in facilitating breakout discussion)

Speakers:
1. **Ms. Chitra Jaisimha**, Consulting Actuary and Founder - Universal Actuaries and Benefit Consultants
2. **Mr. Hemanshu Jain**, Consulting Actuary at Mercer India Consulting

The advent of Big Data Analytics coupled with technological advances has the opportunity for actuaries of the future, in India to redefine the approach to employee benefits advice. Deeper Data analytics can be a big benefit to the employers and employees. “People Data Analytics” has forced organisations to look beyond spreadsheets and conduct deeper analysis to improve corporate employee benefits. It has therefore become even more important for the employee benefits actuary and the actuarial profession to be equipped with Big Data Analysis, as well as advise clients suitably on assumptions ad beyond.

Where can practioners expand the usage of data analysis in their work in Pensions, Employee benefits and Social security? What techniques can they use?

Participants will contribute to specific discussion questions, get a chance to work on some practical exercises and deliver group presentations. Given the online format, complexity of examples /exercises will be chosen suitably.

Registration fees for full day (Excluding GST)

IAI Students & Associates	Fellows	Non-Members
Rs. 1,500	Rs. 2,000	Rs. 2,000

Participation is on a first come first serve basis and limited to 80 registrations.
Registration deadline: 2nd February, 2021 (up to 80 registrations) to allow pre-allocation of groups.
CPD Credit as per APS9: **4 hours Technical for the whole day** (Pension & Other Employee Benefits)
Link to register: http://www.actuariesindia.org/subMenu.aspx?id=497&val=Webinars
Point of contact: Ambreen@actuariesindia.org

17th Current Issues in Retirement Benefits - Module 3

Date: 10th September 2020; Thursday **Time:** 17:00 - 18:30 IST

Topic: What has 2020 meant for Employee Shared Based Rewards

Chair: Kulin Patel, PEBSS Advisory Group

Moderator: Hemanshu Jain, Member, PEBSS Advisory Group

Speakers: Anubhav Gupta, Director, Human Capital Consulting, Deloitte

Vichitra Malhotra, Founder and Consulting Actuary, Veritas Actuaries and Consultants

Introduction

The advisory Group on Pension, Employee benefits and Social Security (PEBSS) organized a 4-module series on 17th Current Issues in Retirement Benefits. On September 10, 2020, Module 3 – What has 2020 meant for Employee Share Based Rewards, was organized. This was moderated by Hemanshu Jain.

Kulin Patel set the context of the session by explaining how the current market environment of volatility and uncertainty against the backdrop of pandemic have made design issues of employee-based reward plans a pertinent topic for our industry practitioners as well as businesses.

The first session was addressed by Anubhav Gupta who discussed the impact of 2020 economic environment on the trends, design, governance, valuations, and relevance of employee share-based rewards. This was followed by Vichitra Malhotra who discussed the impact from valuer's perspective – how recent trends impact the valuers work and how it is reflected in the valuations.

Session 1:

Current Scenario of share based payments in India

In the current scenario, to retain and incentivize employees, Long Term Incentive (LTI) plans are almost essential and their usage is expected to rise going forward. Currently about 63% of companies offer some kind of long-term reward to its employees, hence it plays a huge role in how companies' structure employee benefit, especially at the senior most levels. The returns on LTI largely differ from one industry to another. For example, banking and IT sectors offer high returns as compared to traditional manufacturing sectors.

The most prevalent and widely accepted long term incentives are the share-based rewards. The primary logic behind giving share-based compensation is that the remuneration of executives should be aligned with the shareholders in the long run. Traditionally, the most compelling reason to stick to share based payments was accounting. Under GN 18, the company had choice to account for intrinsic value of options as cost of options. This meant if the stocks were granted to employees at a future fixed date at the current stock price, the intrinsic value was nil. Hence no P&L expense was created in the books. This was a huge advantage for the employers.

Adoption of IND AS 102 has changed the game. Stock option expensing has become a reality as now the companies are required to report fair value of options and show it as a compensation expense. Hence now the companies are moving towards other innovative stock option reward plans such as restricted stock options (RSU's) and performance shares. These stocks generally have some vesting criteria and can be exercised contingent on fulfilment of these criteria. These shares are provided to the employees at a deep discount, so that the downside of the employees is protected to quite an extent.

Impact of COVID19

As this black swan event has stirred up the whole economy, definitely it has affected the value of share-based payments as well. But it's seen that RSU's are comparatively less affected by the current scenario than stock options. The reason is that they are issued at a very deep discount, hence having value above the issue price even in unfavorable market conditions.

Overall, the companies with stock option near to the exercise data shows a high impact. Other than that, these are long term benefits where in the returns depend on the long-term performance of the companies, hence are relatively less impacted.

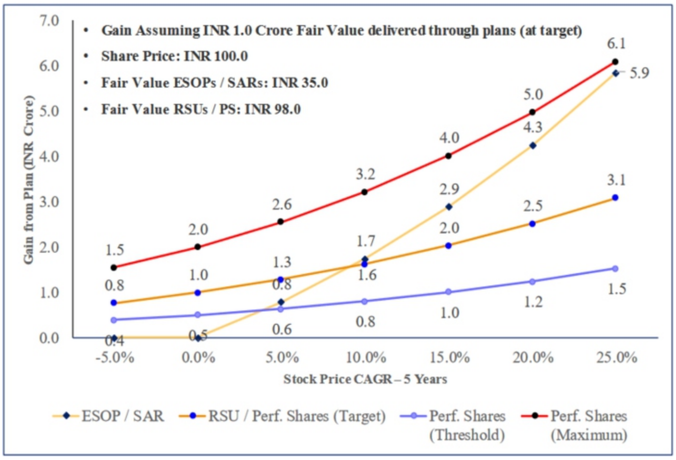
Choice of option to provide?

The choice of the option will depend on what objective they want to drive from the employees. Companies often ask the question “what do we want to reward our employees for?”. This question generally helps in answering which stock options would best fit the company. For a company who wants to see long term commitment, simple share-based options would be preferred. While if the company want to reward smart and hardworking employees, they will go with performance-based share options. Consequently, if the company wants employees to be a part of the success of the organization, restricted stock options wherein the vesting would depend on achieving Pre-COVID levels would be a much better choice.

Deeper Analysis - Payoffs dilution and expense created by ESOP's, performance shares and RSU's

On a general comparative study between stock price and profit value created between stock options, RSU's and performance shares it can be seen that performance shares and RSU's show a gain even when the stock price is the same at issue date and exercise date, while regular ESOP and SAR show no gain, in that scenario.

From the graph, we can observe that performance shares are beneficial for employees even in reduction in stock price scenario. The employees are not penalized for bad market conditions on which they have no control on. Thus, performance shares are observed to offer more stable returns and are not impacted hugely by overall stock performance. While on the other hand if we see ESOP returns, they are highly impacted by the stock performance.



Shift to performance-based share from full value share instruments can be beneficial for the organization and employees both. There is obviously a trade-off between pay protection and shareholders dilution, we cannot simply provide share-based rewards to employees at deep discount, as this will create a dilution of holding of current shareholders without creating comparative returns for them. Wealth creation should be aligned with the performance. Company also have to be cognizant of the fact that it is a competitive environment, if they don't offer rewards in line with their worth, they will see a loss or poaching of their human resource. They also have to be in line with what middle and lower management is being paid. So, the share based rewards cannot be exorbitant, it should align with the value chain created.

Session 2:

Share Based Rewards: Trends and Impact on the work of Valuers

Vichitra Malhotra explained the impact of current pandemic and economic environment under three main themes - impact on design of Share Based Rewards, impact on valuation techniques and impact on valuation assumptions. She set the context by highlighting the recent trend wherein companies like Paytm, Lenskart implemented some or the other form of share-based schemes as part of their employee benefit design. She pointed that the factor driving this trend are the employers need to conserve cash while incentivizing employees and current economic environment of low interest rate and high volatility. Moreover, these schemes align well with both employer and employees' interest in almost all types of economic environment. These subsequent changes in design structure of share-based schemes consequently impacts valuation technique, valuation assumption and increases the role of valuers in the design space.

Impact on design of Share Based Rewards

The employers are moving away from plain vanilla ESOPs and moving towards recovery plans wherein vesting is linked to time period of achieving pre-COVID share price. Another popular benefit option being used is performance share for C-suite which links benefit with employers chosen metric of performance like EDIBTA or revenue target. Also, ESOPs are widely considered by start-ups for wider section of employees rather than restricting to C-suites. Valuers are also helping employers in modification of existing grants, especially those which are out of money for the employees. As highlighted in the previous session, speaker re-emphasized that growing P&L sensitivity for cash settled schemes resulted in these recent trends.

The valuers play a vital role in optimizing the design by providing detailed financial impact analysis of alternative design options with respect to form, size and terms of grant. To decide the form of grant, the analysis can compare expense volatility and long-term risk-return profile of various instruments corresponding to the growth stage of the organization. Organizations in the start-up or early phase of its growth are in high risk and high return environment. Such employers prefer options over stocks. Equity schemes are preferred as companies are cash strapped. As organizations become mature and become cash positive, propensity to give stock increases and such employer can consider cash schemes as well. Another key aspect is to determine if the option will be treated as liability or equity in the books.

Once form of grant is established, the analysis needs to determine the size and terms of the grant. A comprehensive study can include scenario testing of different exercise price/vesting criteria conditions. The objective is to recognize minimize P&L charge for employers and maximize wealth creation for employees.

Valuers are also involved in helping client optimize their modification terms for different grant period and advising them on terms of replacement grant versus new grant.

Impact on valuation techniques

For traditional share-based schemes, Black-Scholes option pricing was most commonly used to determine the fair value. However, for schemes with market related vesting conditions, like archiving targeted Shareholder IRR, valuers need to look for alternative valuation techniques like binomial or simulation models which can incorporate stock price movement in the model. As valuers, it is crucial to have right capacity and skills to put complicated valuation techniques in place. This was explained by looking at a working example which illustrated how simulation models can be useful in evaluating fair value of benefit option which has vesting criteria linked to share value of the company.

Setting up Valuation Assumptions

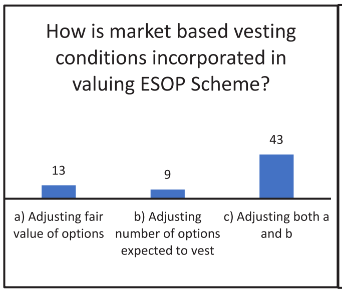
Annualized volatility increased from 20% over 5-year period to 40% over last 8 months in wake of current pandemic in some of companies. While setting volatility assumptions, it is important to consider long-term volatility vs short term impact. Accounting rules also requires to take account of expected exercise period for different schemes and grant. For longer duration schemes, lower volatility could be assumed as it is expected that volatility revert back to its mean in longer period of time.

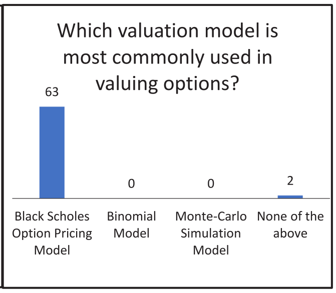
Also, as more employers move towards broad-based schemes, attrition assumption becomes significant. Additionally, non-standard schemes and start-ups where past experience is limited to derive any significant trend creates data quality considerations. This is particularly creating a big challenge to set valuation assumptions.

Conclusion

With stock based rewards being used more so than ever, the non-standard schemes such as Performance shares and RSU's are becoming more prevalent in the market. This requires a greater role of valuers at the design stage. Design and valuation process needs to be in synergy. Advanced valuation techniques are essential to enrapture evolving design structures. This also calls for deeper consideration of the key valuation assumptions such as vesting period and criteria, volatility and attrition rate.

The webinar was followed by a CPD question. The results of the poll were as follows:





Written by

Arohi Jain

arohi37@gmail.com

Arohi Jain is currently working at Numerica Consulting firm.

Mahima Gupta

mahima000@gmail.com

Mahima Gupta is working as Actuarial Consultant with Principal Global Services, Pune.

3rd Webinar in Risk Management - Assessing Credit Risk: Veracity of Models and Significance of Expert Judgement

Date: 4th November 2020; Wednesday **Time:** 16:30 - 18:30 IST

Welcome Address: Kailash Mittal, Chairperson, Advisory Group on Risk Management, IAI

Expert Speak: Lakshmi.V.Iyer, President, Kotak AMC

Research Group Presentation on Credit Risk Computation: Vardhan Chheda, Siddhi Kharkia, Sudheer Raj

Mentor: Amruth Krishnan

Moderator: Megha Garg, Member, Advisory Group on Risk Management, IAI

Introduction

The stress in the banking sector combined with the loss of income and revenue for individuals and companies due to COVID-19 restrictions is expected to increase the credit risk to the financial sector. This has a direct impact on insurers through their investments in debt instruments. IAI has been conducting a series of webinars on Risk Management as part of their efforts to highlight and discuss the various risks faced by insurers. This webinar was the 3rd in the series on Risk Management, conducted by Advisory Group on Risk Management on November 04,2020. The objective of this webinar was to discuss the various aspects of measuring Credit Risk, especially on the importance of expert judgement. The seminar presents results of a research project organised by the Advisory Group on Risk Management. Other projects on Risk Management being conducted by the Advisory Group on Risk Management are -

1. Application of Risk Management in Retirement Benefits
2. Catastrophic Risk Modelling
3. Application of Risk Management techniques in the Management of Annuities

Kailash Mittal started the session by setting the context on the importance of assessing credit risk, particularly in the COVID-19 scenario.

This was followed by a group presentation on Credit Risk Computation by Vardhan Chheda, Siddhi Kharkia and Sudheer Raj. They were ably mentored by Amruth Krishnan. The research group made a presentation on using quantitative modelling to predict the probability of default for a listed firm.

Lakshmi Iyer complemented this quantitative discussion with her insights on the important qualitative aspects of credit risk assessment. She gave a practitioners perspective on the management of credit risk as an investor in capital markets.

Quantitative assessment of Credit Risk - The Merton-KMV model

The research group employed the Merton – KMV model, a structural model, on the financials of Jindal Steels to predict its probability of default (PD). The probability of default in this model is defined as the probability of the asset value of the company falling below the liability threshold before the end of time horizon. Specifically, the group analysed the effectiveness of the Merton-KMV model by comparing the predicted PD of Jindal Steel with its time of actual default. The PD predicted by the KMV model for Jindal steel was 3.74% in FY16. The effectiveness of this model was also compared with the Altman Z score computed for the company. The Z score for Jindal steel for FY16 was 0.876 and this implied a PD of 19.05%. The PD given by the model and the Altman Z score were found to be correlated with each other and were also strongly correlated with the deteriorating financials of the company across the years from 2011-12 to 2015-16. However, it was difficult to predict the time of default using either metric as both metrics started to indicate a heightened and rising propensity to default few years before the actual default.

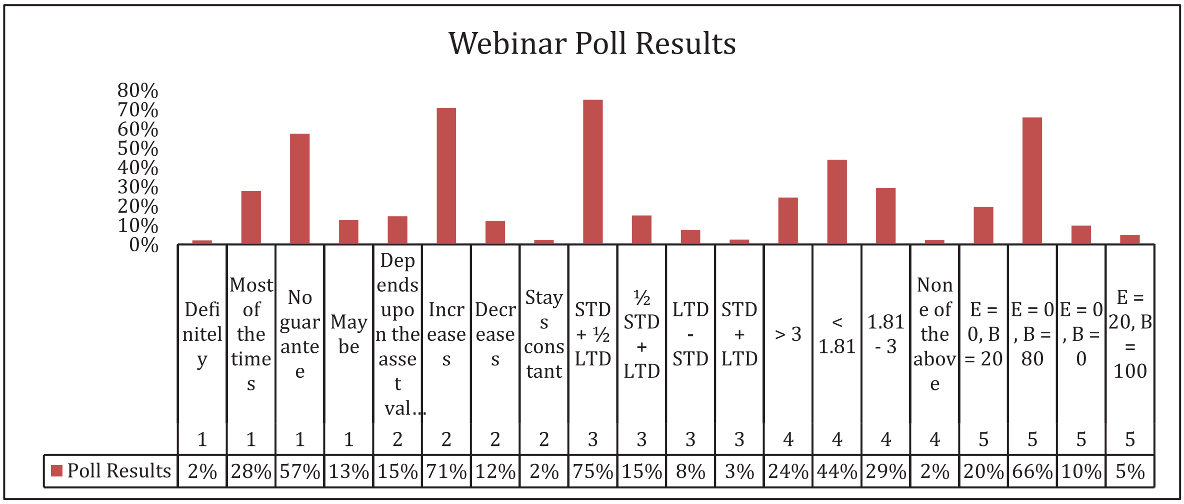
Addressing the qualitative aspects of credit risk

Alongside quantitative metrics, qualitative judgement is also necessary to develop a holistic and accurate view on the credit risk posed by an investee company. Lakshmi elaborated on the constituents of qualitative judgement through the 4 C framework – Cashflow, Covenants, Creditworthiness and Corridor Talks. The framework complements the quantitative metrics by assessing the quality of the numbers and management that go into making these metrics. For example, Corridor Talks consists of acquiring and analysing soft information on the financial conduct of the promoters/MD/CEO.

The Webinar was concluded with Vote of Thanks from the Megha Garg on behalf of the Advisory Group on Risk Management, IAI.

In order to make the webinar more interactive, the organizers also arranged for few online poll questions.

1. Does High credit rating of AAA+ ensures that there is no credit default on the bond?
2. Under the Merton KMV model what would happen to the probability of default if the volatility of stocks increases assuming constant risk - free rate of interest & no- dividend?
3. Under KMV Model Default Point is computed as -
4. What would be the Z score of a company in the 'Danger Zone' according to the Altman Z score model?
5. If the Company's Value, A = 80 & Debt, D = 100, how much will the equity holder & creditor each get at the time of liquidation?



		Poll Results
1	Definitely	2%
1	Most of the times	28%
1	No guarantee	57%
1	May be	13%
2	Depends upon the asset val...	15%
2	Increases	71%
2	Decreases	12%
2	Stays constant	2%
3	STD + ½ LTD	75%
3	½ STD + LTD	15%
3	LTD - STD	8%
3	STD + LTD	3%
4	> 3	24%
4	< 1.81	44%
4	1.81 - 3	29%
4	None of the above	2%
5	E = 0, B = 20	20%
5	E = 0, B = 80	66%
5	E = 0, B = 0	10%
5	E = 20, B = 100	5%

Written by

Madhu Srinivas

vmadhusrinivas@gmail.com

Madhu Srinivas is a Senior Research Associate at Dvara Research with a focus on research related to Financial Systems Design.

Obituary

Shri Navalkishor Naginlal Jambusaria

Shri N.M. Jambusaria, Ex Chairman of LIC and a veteran well regarded Actuary died on 5 December. He was an excellent person and was universally loved and respected.

Webinar on Disaster Risk Financing – A Country Diagnostic Toolkit

Date: 6th November 2020; Friday **Time:** 17:00 - 18:30 IST

Chair: Bharat Venkataramani, Chairperson - Sustainable Development & Microinsurance Advisory Group, IAI

Moderator: Malvika Nath, Member - Sustainable Development & Microinsurance Advisory Group, IAI

Speakers: Rodolfo F. Wehrhahn, Consultant, Ex-IMF and Ex-World Bank

Arman Oza, Consultant

Mayur Ankolekar, Consulting Actuary

Introduction

Disaster risks faced by developing countries can be a significant threat to their continued development. It is essential to have an environment which allows adequate financing arrangements in place to mitigate and manage these risks. A webinar titled “Disaster Risk Financing – A Country Diagnostic Toolkit” was conducted by the Sustainable Development and Microinsurance Advisory Group on November 6, 2020. The webinar aimed to discuss the Asian Development Bank's framework that can be applied by countries to assess and strengthen their financial preparedness against disaster risk. It also aimed to explore the role of government policy, economic conditions, insurance and reinsurance industry in creating an enabling environment.

Bharat Venkataramani started the session by highlighting the importance of 'Disaster Risk Financing', as financial losses caused by natural disasters continue to rise and developing countries experience the greatest impacts.

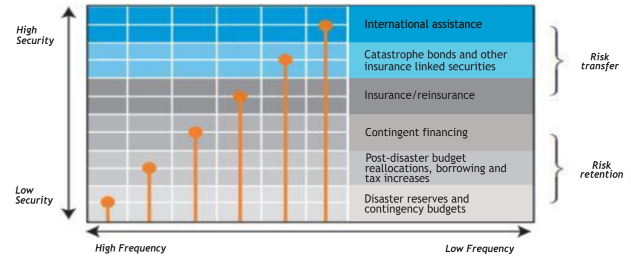
Malvika Nath gave a brief introduction to 'Disaster Risk Financing' and ways to manage the disaster risk. The session was conducted in the form of a panel discussion with Malvika Nath moderating the session and the panelists were Rodolfo F. Wehrhahn, Arman Oza and Mayur Ankolekar.

Disaster Risk Financing - A Brief Overview

Disaster risk refers to the risk of any disaster occurring in a country which is likely to lead to economic, physical and demographic impact like earthquakes, landslides, cyclones etc. It is critical to manage these risks as natural disasters generate significant fiscal risk and create major budget volatility. Even countries with robust disaster risk management programs can still be highly exposed to the economic and fiscal shocks caused by major disasters. As per the study conducted by World Bank, 2 million lives and 3 trillion dollars have been lost in the last 40 years due to natural disasters.

Disaster Risk Financing helps countries ensure that their populations are financially protected in the event of a disaster. The most cost-effective way of financing disaster is through a range of tools in a common framework to address different layers of risk, as no single instrument is optimal for responding to all disaster events, which range from frequent small-scale events to rare catastrophic events. This 'Layered Approach to Disaster Risk Financing', postulated by Asian Development Bank (ADB) suggests that risk financing tool should be selected based on the severity and frequency of risk.

Figure 1: Layered Approach to Disaster Risk Financing



Source: Asian Development Bank (2013).

Disaster risk or risk in general can be managed in either of the following ways: avoid, transfer, reduce or retention of the risk. In order to transfer the risk, the decision to insure or not insure the public assets might be tricky for the government as there might be capacity to retain the risk. Therefore, the government needs to ponder upon the exposure, risk and the vulnerabilities so that the risk managing instruments available in other countries can be evaluated and selected for applicability in order to manage and mitigate disaster risk. For the execution of the ADB framework, the government needs to develop data, hazard maps, and make them publicly applicable. Apart from developing the resources, the government also needs to coordinate the efforts of various entities to avoid overlap and wastage of resources.

Disaster Risk Financing Toolkit - Vision and Appropriateness

The Disaster Risk Financing Toolkit provides diagnostics framework that can be applied to support countries in assessing and strengthening their financial management of disaster risk. It focuses on the state of the enabling environment and opportunities for its enhancement to support the increased availability and uptake of insurance and other risk transfer instruments.

The design of the toolkit takes into consideration that it will be used by developing countries and there might be different barriers to the more effective use of disaster risk financing instruments. Considering that not many governments have separate departments for disaster, the toolkit is easy to understand and useful for people, ministries, bureaucrats who are not specialists in disaster risk management. The toolkit looks at assessing the performance of a country and developing disaster risk financing instruments with respect to six coordinates:

- Government Policy
- Economic Conditions and Support Functions
- Product Availability and Affordability
- Credibility of Insurance & Capital market stakeholders
- Social Protection Policy
- Unlicensed and Informal Players

A strong enabling environment for disaster risk financing is a prerequisite for achieving the objective of strengthening the financial management of disaster risk. This includes creating a suitable environment for the stimulation of risk transfer markets and making available reliable reinsurance protection. The effectiveness of disaster risk transfer instruments depends crucially on the availability of well-developed and sound domestic insurance and capital markets.

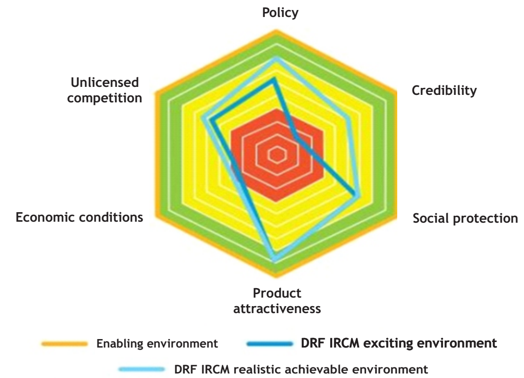
Economic environment that has low inflation and some strong elements of growth is crucial. For financial environment we need to have forward markets, environment around reinsurance should be conducive, environment around asset information has become very relevant for measuring exposure and for mapping of hazards.

The six coordinates of the framework help to arrive at 'achievable environment' by looking at the enabling environment and the existing environment.

Trends from Pilot run of the Toolkit

The tool was piloted in Nepal, Sri Lanka, Pakistan and Fiji and the main trends which emerged as part of pilot run

Figure: The W&W Insurance, Reinsurance, and Capital Market Solutions Development Framework (Hypothetical Example)



DRF disaster risk financing; IRCM = insurance, reinsurance, and capital market.
Source: Asian Development Bank.

were:

- **Credibility of Insurance Sector:** Public perception about insurance was not very high in all 4 countries. Underinsurance created a deformed image of Insurance industry in the minds of banks and ultimate beneficiaries. Therefore, the insurance industry needs to work on building confidence amongst the government, common people and banks.

- **Economic Conditions:** The ability to cope with the disaster was very limited in all 4 countries and government finances were already under pressure. The only solution to this problem is ex-ante instruments because the public finance situation does not warrant too much reliance on ex-post instruments.

- **Informal Insurance:** In many countries, community-based insurance schemes operate below the regulatory radar. Though these schemes are doing a good job to build resilience at the bottom but there is a need to regulate them properly. The purpose should be to allow them to function in orderly and disciplined way rather than to mainstream them into commercial insurance.

The assessment technology of the current toolkit is Qualitative, and changes can be made to the toolkit to make it more Quantitative which will be difficult given countries with different geopolitical backgrounds will be involved. The resilience of health system of a country is the main thing needs to be incorporated in the current framework.

Role of various parties in Disaster Risk Management

Government and Insurance Industry

Government has predominant role in mitigating disaster risk, but it cannot individually mitigate the risk. Government has different responsibilities like social and economic responsibility, responsibility for public assets. So, the government must address the needs of relief, recovery and reconstruct by evaluating how to finance these phases. Reconstruction is an area that requires insurance and some ex-ante products. So, it is the role of insurance to support the government in mitigating disaster risk. The government can create an enabling environment by making available the data and making sure they have good understanding of the economics behind the disaster risk managing instruments. One might believe that Risk retention is a valid strategy to mitigate risk or finance disaster risk. However, in order to retain the risk, government needs to know the exposure in terms of money required and the frequency at which it will be required.

Regulator

Regulation is created by the credibility of the supervisors. There are particularly two forms of regulation:

1. The supervisor needs to make sure that the companies are resilient to shocks i.e. they are sufficiently capitalized. The supervisor needs to make sure that there is no loss to the policy holder if failure happens and the scheme remain intact.

2. The Supervisor is an advocate of consumer protection therefore need to make sure that there are no abusive products. Secondly, he needs to make sure that the regulation is risk based (proportional to the risk) and not rule based. The regulator needs to create opportunities for the insurance sector to develop.

To make sure the system works, regulator should be flexible, open to new technology, new methods, use block chains and different distribution channels. Index insurance is an innovative approach to insurance provision that pays out benefits on basis of predetermined index for loss of assets and investments resulting from natural disasters.

Products used for Managing Risks

There are two categories of products in general available for managing risks – Ex-ante and Ex-post. Ex-ante products include insurance and contingent financing arrangements and the sovereign reserves that country has created from their own annual budgets. Ex-post financing heavily relies on external aid. The development of Ex-ante products is hampered because there is immediate emotional support for the country that has been affected and as result of that private and external aid is available. Therefore, there is very little presence of ex-ante products specially insurance at the sovereign level. Private insurance on the other hand is happening at its own pace as it is driven by private insurance country. The extent of private insurance depends on size and level of insurance industry in that country. But private insurance can never be enough to provide for a nation-wide cost of the disaster.

Closing Remarks

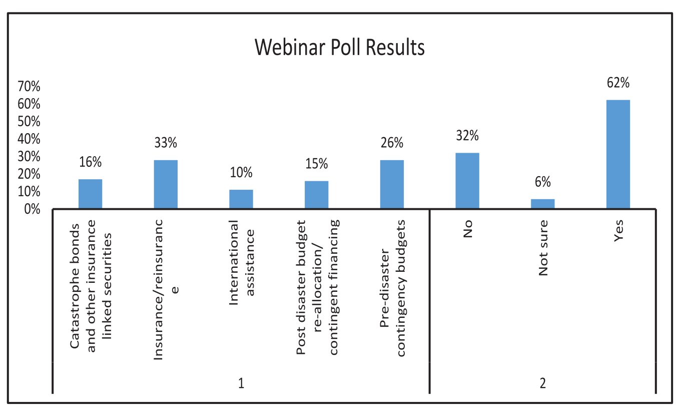
The webinar was concluded with the CPD questions and a vote of thanks by Malvika Nath on behalf of the Advisory Group - Sustainable Development & Microinsurance, IAI

Poll Questions

In order to make the webinar more interactive, the organizers also arranged for few online poll questions:

1. In your opinion, which of the following is the best measure to mitigate the risk of pandemics such as the current one (you can choose more than one option)?

2. Is disaster risk management for public assets the primary role of the government?



Written by

Timsi Sethi

sethi.timsi@gmail.com

Timsi Sethi is a member of the Institute of Actuaries of India and working as Retirement Consultant with Willis Towers Watson.

Organizing the Unorganized marketing - employment

This article is to highlight various issues of unorganized marketing activities and how to focus its development and sustaining in critical situations (i.e. unemployment benefits, training needs in unorganized marketing and social security benefits to the participating people in this sector).

Introduction to unorganized sector:

Unorganized or informal sector constitutes a pivotal part of the Indian economy. More than 90 per cent of workforce and about 50 per cent of the national product are accounted for by the informal economy. (Ref-1)

A high proportion of socially and economically underprivileged sections of society are concentrated in the informal economic activities. The high level of growth of the Indian economy during the past two decades is accompanied by increasing the role of informal sector.

There are indications of growing inter-linkages between informal and formal economic activities. There has been new dynamism of the informal economy in terms of output, employment and earnings. Faster and inclusive growth needs special attention to informal economy.

Sustaining high levels of growth are also intertwined with improving domestic demand of those engaged in informal economy, and addressing the needs of the sector in terms of credit, skills, technology, marketing and infrastructure.

Definitions used:

Self employment

Individual solely operating his/her own economic activities for livelihood, play a key role in the business and participate in improving economy.

Unemployment (as per Bureau of Labour Statistics)

Persons are skilled or semiskilled or unskilled
Possessing good health
Seeking opportunity to work
Willing to work in which they are competent
For livelihood
But they are unable to find a job.
They are still in search of a job
Lost jobs due to natural calamities, lockdowns, economic downturns, pandemic diseases, etc.,

The following are not considered as unemployed:

Prefer to be unemployed
Incapable and unhealthy
Zero to fifteen and above sixty years of aged
Sit idle and pass time without undertaking any work
Pretend and try to get unemployment benefits
Trying for better opportunity by leaving the present employment

Unemployment rate is measured:

a. Total eligible workforce
b. Unemployed people

Unemployed rate = b/a. This is a key macroeconomic factor

"Unorganized Sector":

An enterprise owned by individuals or self-employed workers and engaged in the production or sale of goods or providing service of any kind whatsoever, and where the said enterprise is not covered under the definition of factory in the Factories Act, 1948;"

Section 2(m) in The Factories Act, 1948 (Ref 2)

(m) "Factory" means any premises including the precincts thereof—

(i) whereon ten or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on with the aid of power, or is ordinarily so carried on, or

(ii) whereon twenty or more workers are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on without the aid of power, or is ordinarily so carried on (subject to exceptions)

Labour force

The Ministry of Labour, Government of India, has categorized the unorganized labour force under four groups depending on:

(1) Occupation
(2) Nature of employment
(3) Especially distressed categories and
(4) Service categories

Key features of self employment

1. Take the assistance from family members as it is backbone of India's economy and the mainstay of its livelihoods.
2. Start with limited financial capabilities and needed infrastructure.
3. Employ limited paid assistants (less than 9) based on the capability and only if needed.
4. More particular to employment and some are migrated from native place.
5. With low skills, linkages and inputs needed to face the market and others.
6. It is a continuous process.
7. Sometimes it is hereditary.
8. In future too, the unemployed will turn towards self-employment.
9. Prospective self-employers will increase because of unemployment.

Social security and welfare of unorganized workers:

The Unorganized Workers Social Security Act, 2008 was enacted for the social security and welfare of unorganized workers. (Ref.3)

(a) The Unorganized Workers Social Security Act, 2008 (Section 3)

The Central Government shall formulate and notify, from time to time, suitable welfare schemes for unorganized workers on matters relating to: (including unemployment allowance)

(a) Life and disability cover;
(b) Health and maternity benefits;
(c) Old age protection; and
(d) Any other benefit(s) as may be determined by the Central Government

Other benefits means: old age pension, unemployment allowances, maternity benefits, life insurance cover, accident and medical Facility, provident fund, etc.

(b) Social security is defined in its broadest meaning by the International Labour Organization (ILO) as:- (Ref 4)

Social security is the protection that a society provides to individuals and households to ensure access to health care and to guarantee income security, particularly in cases of old age, unemployment, sickness, invalidity, work injury, maternity or loss of a bread winner.

Population: Total population of the world is approx 771 crores. The top five countries having large population are: (As of October 2020 - Ref 5)

S.No.	Country	Population in crores	% of World population Col.3/771
(1)	(2)	(3)	(4)
1.	China	144	18.67
2.	India	138	17.90
3.	USA	33	4.20
4.	Indonesia	27	3.50
5.	Pakistan	22	2.85

Most of the large populated countries will have participation of unorganized sector in National activities. Their contribution and difficulties are unnoticed to a large extent. Therefore, their recognition and protection are the need of the hour

Frailties of unorganized marketing:

- Lack of proper education to suit their working/activities
- Poor financial resources
- Backwardness
- Some are illiterates
- More of self employment
- Lack of agriculture opportunities
- Unable to migrate
- Some migrate due to compulsions.
- Family constraints etc.,

Current issues faced:

Because of difficult situations like Pandemic diseases, Lock down, Natural calamities, Disasters etc., adverse situations are resulted.

As an onlooker and researcher, the following were witnessed in the very recent past. (Qualitative expressions are given and Quantitative figures are not collected and presented as they were alarming). As an individual researcher it is a limitation to trace and collect such sporadic data. Felt it is sufficed and appropriate to identify the issues.

A few are cited here for consideration:

(I) Self employed and unorganized sector employees lost income or lost their low level income jobs
(ii) They are forced to walk with family a few hundred

kilometers to reach their native villages with important belongings on their head and shoulders for maintaining security.

(iii) In this process people faced at worst starvation and at best with malnutrition food.
(iv) Risk of contracting COVID-19 is increased
(v) In some places, returning workers are not allowed to their local areas.
(vi) People died in the course of reaching destinations
(vii) The death of tired workers who walked a long distance and slept on rail tracks lost their lives by a train over run is very pathetic.
(viii) Deceased were deprived of last looks of dears and nears and missed performing traditional last rites.
(ix) When people went back to their native places, employment opportunities do not exist for them.
(x) Where employment opportunities are available, people left due to panic pandemic situation.
(xi) Reverse migration is also a serious problem in future for the unorganized sector.
(xii) Their children were deprived of schooling activities
(xiii) Family members do find uneasy situations
(xiv) Both self employed and employee(s) depended on Government's help
(xv) Social relations are strained or missing
(xvi) Cessation of transport and closing the boundaries were seriously hit
(xvii) Disequilibrium between demand and supply is persisting
(xviii) Inaccessible credit (both Indigenous and Banking)
(xix) Savings are eaten

There are several other untold miseries faced.

Adverse effects of unemployment:

- Loss of purchasing power
- Family life is paralyzed
- Economically imbalanced
- Supply and demand disequilibrium for goods and services
- People curse the rulers
- Unemployed felt it is the duty of government to provide social security to all such needy
- Both domestic and foreign trades affected
- Crime rate going up due to social inequalities
- Pandemic diseases show impact
- Death rate increases
- Children schooling and quality of education is at stake
- Age old people felt unsecured ...etc.

Charity to people:

Charity will help for sometime only. The employer or other organizations will feed and provide to some extent the needs of the unorganized work force. But charity will lost soon.

What is expected?

Here, I wish to stress and highlight the three important aspects faced by this mighty sector. These are:

(I) Unemployment Benefits
(ii) Social security benefits and
(iii) Sustainable and viable measures for unorganized marketing force

Unemployment Benefits:

"The Unorganized Workers Social Security Act, 2008" specifies the eligibility for registration and social security benefits. As per Section 10:

Procedure for receiving

(1) Every unorganized worker shall be eligible for registration subject to the fulfillment of the following conditions,
  (a) He or she shall have completed fourteen years of age; and
  (b) A self-declaration by him or her confirming that he or she is an unorganized worker.
(2) Every eligible unorganized worker shall make an application in the prescribed form to the District Administration for registration.
(3) Every unorganized worker shall be registered and issued an identity card by the District Administration which shall be a smart card carrying a unique identification number and shall be portable.
(4) If a scheme requires a registered unorganized worker to make a contribution, he or she shall be eligible for social security benefits under the scheme only upon payment of such contribution.
(5) Where a scheme requires the Central or State Government to make a contribution, the Central or State Government, as the case may be, shall make the contribution regularly in terms of the scheme.

From the specific fund created/to be created, the authorities should provide unemployment benefit to them in case of need.

For this a foolproof system to be designed based on Adhaar

Social security benefits:

The underlying idea behind **social security benefits** is that a citizen who has contributed or is likely to contribute to his/her country's welfare should be given **protection** against certain hazards. The concept of **social security**, thus, is based on the ideals of human dignity and socio-economic justice.

Social security benefits are:

- Retirement = Provident Fund & Pension
- Disability = Insurance and workmen compensation
- Survivors =compassionate ground employment etc., and
- Supplemental retirement benefits , if any

Sustainable and viable measures for unorganized marketing force:

1. There is a greater need to improve this mighty force "skill, education and training"
2. Unorganized marketing is not a subject in University education for imparting marketing knowledge. Now there is a dire need.
3. Creating awareness in:

a) Safety
b) Health and Insurance
c) Occupational hazards
d) Innovation needs
e) Environment impact
f) Legal compliances
g) Accounting
h) Occupational hazards
i) Knowledge on unorganized Sector etc.,

Skills needed on top priority for Unorganized marketing persons:

In India, the informal sector of the economy represents 80.8% of the total workforce (according to National Commission for Enterprises in the Unorganized Sector, Periodic Labour Force Survey 2017-18 Report-(Ref-6)

- Improving productivity,
- Motivating them to market orientation
- Improving length and breadth in products range
- Opportunities for Income generation
- Imparting knowledge on occupational risks to health and safety & insurance.
- Creating better working conditions,
- Avenues to economically and socially rewarding trades/employments
- Commercial skills:
  Problem-solving and management,
  Communication techniques (soft skills)
  Negotiation and bargaining
  Policy measures
  Stimulating interest in self employment
  Improving Numeracy and Computer literacy
  Business forecasting
  Application of safer technologies (Billing, E payments, Accounting etc)

Who should shoulder this responsibility?

1. Human Development Resource Centre, United Nations Development Programs, India (Ref-7)

Brief: On the ground in about 170 countries and territories, UNDP works to eradicate poverty while protecting the planet. UNDP help countries develop strong policies, skills, partnerships and institutions so they can sustain their progress.

UNDP has worked in India since 1951 in almost all areas of human development, from systems and institutional strengthening to inclusive growth and sustainable livelihoods, as well as sustainable energy, environment and resilience. UNDP's programs continue to fully integrate a global vision for catalytic change with India's national priorities.

With over 30 projects on the ground in almost every state, today UNDP India works to achieve the Sustainable Development Goals by transforming traditional models to do development differently.

This has to reach the needed people who are registered in unorganized employment.

2. National Commission for Enterprises in the Unorganized Sector:

The Commission was established in 2004 to act as an advisory board for matters regarding the informal employment sector.

(This was dissolved in 2013).

Now MSME (Micro, Small, and Medium enterprises) is established. This is beyond the reach of unorganized sector.

MSME units

MSME = MICRO, SMALL AND MEDIUM ENTERPRISES. They are monetarily supported and extended moratorium facilities by revising the guidelines based on capital invested and turnover. The same is not practical at all in the unorganized sector. Unorganized is not in the MSME range.

How to impart skills?

The above skills are to be identified objectively and planned for imparting on tailor basis:

- Literate and illiterate
- Rural and Urban
- Male and Female
- Self Employed and Hired employee
- Locality and Language
- Perishable and Durable products
- Static and footloose

Who can impart ?

(At present unorganized marketing is not a subject in the university education. Only formal marketing is taught.)

- Professionals having exposure in unorganized marketing can impart. Like (a) Company Secretaries (b) Cost Accountants (c) Chartered Accountants d) and Actuaries
- Researchers in the field
- Experts interested in imparting training.

What is needed to create conducive environment?

1. Data collection is through registration of unorganized worker. A specified system of recording the unemployment must be created.
2. Unorganized sector data collection is difficult. Therefore, it is to be linked to Adhaar card.
3. Integration to formal sector to be considered on the Adhaar unorganized employment exchange basis.
4. Present employment exchange role should be redefined on this basis.
5. This sector will find it difficult to shift from one trade of work to another. Hence, the family needs are to be borne in mind.
6. In our country, it is always not good to provide only monetary help.
7. They must be channelized to regular activities. They should report through some registration process to secure any benefits automatically without trying/waiting for.
8. To examine their interdependent, independent and competitive opportunities. This will be helpful for skill development.
9. Their trade union relations have to be looked in to by proper education.
10. India is a labour rich country. This factor is surviving in unorganized sector for time immemorial. Hence, a clear system to be tuned to the needs.
11. By registration process we can avoid child labour up to 14 years of age completion.
12. Training provided to this sector by proper identification will help them to change employments towards upward or downward or circular as the situation may demand.
13. Lot of footloose workers will benefit when the loss of employment or income is reported (by both employer and employee). That is why a clear record and reporting system is needed.

Resumption of post natural calamities, lockdown, economic downturns, pandemic diseases, etc.,

Like for formal sector, unorganized sector too do need meticulous attention for survival and abilities to face critical issues.

1. Financing formally. Otherwise indigenous money lenders will play their crucial role.
2. Needed training and linking up with required infrastructure.
3. Making them to register as unorganized worker and specify the transactions through organized banking and get eligible for socio-economic benefits.
4. Incentives to motivate to report various macro economic factors to slowly become at par with organized sector.
5. Announcing awards and rewards. Like in Film industry & Formal Industries, etc.,
6. Rehabilitation measures for reverse migration. Establishing confidence in the minds of this mighty and uncared struggling force.
7. Necessary Social security measures are made available.
8. Avoiding Child labour
9. Providing family welfare.
10. Assuring guaranteed minimum wages.
11. Familiarize the protection available. Etc.,

Conclusion:

a) Motivate to use digital payment systems and make known available benefits of banking. This will help Government linking benefits to them at times of distress.

b) The Unorganized marketing cannot be forgotten. This sector is rapidly increasing. The capacity to absorb in formal employment is too limited compared to the growing population.

c) This system must be automatic and is to be toned up to suit to current day context.
   - Stimulation of purchasing power till they re-start getting income.
   - Create conducive environment to become successful entrepreneurs.
   - Provide health, safety and daily needs during tough times.
   - Other supports as needed in the society etc.,

d) Finally the objective is “Creation of employment opportunities”

e) Measures are necessary to bring unorganized sector in to organized manner, though unorganized sector cannot be eradicated.

f) This has to be shouldered by both the central and state governments.

g) If suitable steps are not deliberately taken, the life of unorganized people will roll from frying pan to fire.

I, therefore, stress the need to translate the above in to action at a pace required. Hence, there must be a mechanism established suitably.

References:

1. Report of the Committee on Unorganized Sector Statistics National Statistical Commission Government of India - February 2012
2. The Factories Act, 1948
3. The Unorganized Workers Social Security Act, 2008
4. International Labour Organization (ILO)
5. Worldometer
6. National Commission for Enterprises in the Unorganized Sector, Periodic Labour Force Survey 2017-18 Report).
7. Human Development Resource Centre, United Nations Development Programs, India

Written by

Dr. KS Ram

ksram100@yahoo.co.in

Dr. KS Ram is a Researcher on unorganized marketing.

Auction Theory by Former Actuary

ABSTRACT

Auctions – with their clear rules that govern this strategic behaviour – comprised a natural arena for their research. However, auctions have gained in practical significance and, since the mid-1990s, they have been increasingly used in the distribution of complex public assets, such as frequency bands, electricity and natural resources. Fundamental insights from auction theory provided the foundation for constructing new auction formats that overcame these new challenges.

The outcome of an auction (or procurement) depends on three factors. The first is the auction's rules, or format. Are the bids open or closed? How many times can participants bid in the auction? What price does the winner pay – their own bid or the second-highest bid? The second factor relates to the auctioned object. Does it have a different value for each bidder, or do they value the object in the same way? The third factor concerns uncertainty. What information do different bidders have about the object's value?

Using auction theory, it is possible to explain how these three factors govern the bidders' strategic behaviour and thus the auction's outcome. The theory can also show how to design an auction to create as much value as possible. Both tasks are particularly difficult when multiple related objects are auctioned off at the same time.

PREFACE

When one thinks of auctions, one typically imagines the auction of a bankrupt person's property to pay off his creditors. Indeed, this is the oldest form of auction. People have always sold things to the highest bidder, or bought them from whoever makes the cheapest offer. Nowadays, objects worth astronomical sums of money change hands every day in auctions, not only household objects, art and antiquities, but also securities, minerals and energy.

In the 1990s, the U.S. Federal Communications Commission (FCC) put this theory to work to better allocate radio frequency bands to telecom and media companies. The agency previously allocated spectrum using license applications and random lotteries. By using **Milgrom's and Wilson's** auction format, designed to counter the problems of uncertain values and the winner's curse, the new FCC spectrum auctions drove billions of dollars in sales over the next 20 years.

Milgrom and Wilson's ground-breaking initial work should be regarded as basic research. They wanted to use and develop **game theory** to analyse how different actors behave strategically when they each have access to different information.

The new auction formats are a beautiful example of how basic research can subsequently generate inventions that benefit society. The unusual feature of this example is that the same people developed the theory and the practical applications. **The Laureates'** ground-breaking research about auctions has thus been of great benefit, for buyers, sellers and society as a whole.

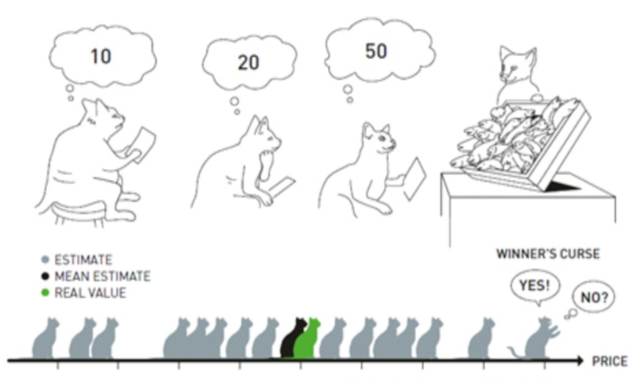
WINNER'S CURSE

Robert Wilson developed the theory for auctions of objects with a ***common value*** – a value which is uncertain beforehand but, in the end, is the same for everyone.

As the Academy notes, "Wilson developed the theory for auctions of objects with a common value — a value which is uncertain beforehand but, in the end, is the same for everyone".

Wilson showed why rational bidders tend to place bids below their own best estimate of the common value: they are worried about the ***winner's curse*** – that is, about paying too much and losing out.

Milgrom and Wilson have not only devoted themselves to fundamental auction theory. They have also invented new and better auction formats for complex situations in which existing auction formats cannot be used. Their best-known contribution is the auction they designed the first time the US authorities sold radio frequencies to telecom operators.



Source : Google

COMMON VALUE V/S PRIVATE VALUE

Paul Milgrom formulated a more general theory of auctions that not only allows common values, but also ***private values*** that vary from bidder to bidder. He analysed the bidding strategies in a number of well-known auction formats, demonstrating that a format will give the seller higher expected revenue when bidders learn more about each other's estimated values during bidding.

In most auctions, the bidders have both private and common values. Suppose you are thinking about bidding in an auction for an apartment or a house; your willingness to pay then depends on your private value (how much you appreciate its condition, floor plan and location) and your estimate of the common value (how much you might be able to sell it for in the future). An energy company that bids on the right to extract natural gas is concerned with both the size of the gas reservoir (a common value) and the cost of extracting the gas (a private value, as the cost depends on the technology available to the company). A bank that bids for government bonds considers the future market interest rate (a common value) and the number of their customers who want to buy bonds (a private value). Analysing bids in auctions with private and common values turned out to be an even trickier problem than the special cases analysed by Vickrey and Wilson. The person who finally cracked this nut was Paul Milgrom, in a handful of papers published around 1980.

Milgrom's analysis included new and important insights about auctions. One of these concerns how well different auction formats deal with the problem of the winner's curse. In an English auction, the auctioneer starts with a low price and raises it. Bidders who observe the price at which other bidders drop out of the auction therefore obtain information about their valuations; as the remaining bidders then have more information than at the start of the auction, they are less prone to bid below their estimated value.

This particular result reflects a general principle: an auction format provides higher revenue the stronger the link between the bids and the bidders' private information. Therefore, the seller has an interest in providing participants with as much information as possible about the object's value before the bidding starts. For example, the seller of a house can expect a higher final price if the bidders have access to an (independent) expert valuation before bidding starts.

CONTRIBUTION TOWARDS SOCIETY

The work of Dr. Milgrom and Dr. Wilson have helped governments and private companies design their auctions better. This has, in turn, helped in the better allocation of scarce resources and offered more incentives for sellers to produce complex goods. This theory would also help to allocate everything from the right to extract water to carbon emissions permits at the heart of global climate change policy.

References:

1. https://www.nobelprize.org/prizes/economic-sciences/2020/popularinformation/#:~:text=The%201996%20Laureate%20in%20Economic,entirely%20independent%20of%20each%20other.
2. https://www.investopedia.com/terms/w/winnerscurse.asp#:~:text=The%20winner's%20curse%20is%20a,true%20worth%20of%20an%20item.&text=As%20a%20result%2C%20the%20largest,ends%20up%20winning%20the%20auction.
3. https://indianexpress.com/article/explained/economics-of-auction-nobel-prize-paul-r-milgrom-robert-b-wilson-6722558/
4. https://www.nobelprize.org/prizes/economic-sciences/2020/press-release/
5. https://www.sciencemag.org/news/2020/10/economics-nobel-honors-pioneers-auction-theory
6. https://www.civilsdaily.com/news/explained-the-economics-of-auctions/

Thank You

Written by

Ashwin Agarwal

agarwalashwin7@gmail.com

Ashwin Agarwal is working as an Actuarial Analyst at Principal Global Services (Pune).

The effect of COVID-19 on Defined Contribution Pension Schemes: NPS

Preamble

COVID-19 impact on citizens who were the member of any pension schemes in India, various pension providers and economy.

- **Salaried employees** who were affected due to **unpaid leave of absence** due to non-operation by various organizations.
  - Hence causing a reduction in personal disposable income and opting out to miss contributions into pension's pot.
- **Salaried employees** who were affected due to **job cuts** (redundancy).
  - The number of missed contribution years will depend on the duration of economic recovery and personal liquidity as well.
- **Self-employed** citizens who missed contributions due to non-operation of businesses and economic shutdown, thereby, facing **liquidity issues**.
- A **temporary redundancy** would not cause liquidity issue, however, people falling under this category could miss contributions into pension pot.
- The missing of contributions would have caused problem for various **independent pension providers**.
  - Moreover, it could have also led to a run on various pension providers in sense of higher withdrawals, thereby, increasing the liquidity problem for them.
  - Which could have further led to a change in the investment strategy, followed by the concerned providers.
- COVID-19 bought a catastrophe that **increased the mortality decrement** in the economy, thereby, compelling the pension providers to change their valuation assumptions.
  - That would have further caused an increase in their contribution rates to cover any shortfall (caused due to a reduction in the investment income, missed contributions and higher withdrawals by members).
- The effect on the **employers** due to **non-operation of businesses**
  - Thereby, causing liquidity issues with them as well.
- In addition, COVID-19 bought an increase in **state expenses.**
  - To cover the liquidity problem the state offered lump sum payment at flat rate to various pensioners, thereby, increasing state expenses, hence compelling it to issue bonds.
  - Where bonds issued are floating rate saving bond with an interest rate of 7.15% that would reset after 6 months with no option to pay interest on cumulative basis.
  - This might have increased the debt, thereby, disturbing (increasing) the Debt Equity Ratio and lowering the value for various equity shareholders.

Analysis using a model

- The COVID-19 effect is on members is assessed by constructing a model which explains how missing of contributions from current age could affect different age group of members.
- This could be assessed by evaluating a reduction in the accumulated value of the fund at different durations: **COVID-19 affected years**, **Post-COVID-19** and **Pre-Retirement Period**.
- To indicate the current effect the contributions are accumulated half yearly and annually using the return on fund assumption from the entry age. This would help in estimating the effect of non-payment of contributions.
- Moreover, the model calculates the projected pension fund value and replacement ratio at entry age, further uses the later projected value (replacement ratio) to determine the required contribution rates each year until retirement age.
- Later the model determines the fund value at end and replacement ratio via increased contributions using the same method.

- In addition to it, the model also determines the required contributions via the ratio of fund and final salary without using the annuity & inflation rate and end of retirement age assumptions.

- Apart from this the model also examines the effect of missing contributions and returning to work post COVID period.

- For analysis purpose the member's working duration is divided into 4 different phases which are:

  - **PRE COVID-19 Period:** From Entry Age till Current age.

  - **COVID-19 Period:** Current Age Plus Non-Contributory ages.

  - **POST COVID-19 Period:** Retirement Age (Less) Current age (Less) Duration of missed contributions (Less) Duration Pre-Retirement Age.

  - **PRE-Retirement Period:** End of Post COVID-19 Period till the assumed retirement age.

Factors

The effect on Defined Contribution pension schemes is based on various factors, which could be categorized among Financial, Demographic, Economic and other:

Financial

- Current Salary
- Salary at entry age
- Salary Increase rate (Past and Future)
- The member and employer (perhaps) contributions at different durations such as pre & post COVID and pre-retirement period (Past and Future)
- Size of pre-existing pension fund.
- Salary Increase rate on rejoining (post COVID Period, which is assumed to remain equal throughout)
- Expenses
- A reduction in salary and personal disposable income on recommencing work (this could be one of the factors, however, its ignored under such analysis, which is explained in Appendix)
- Investment Strategy adopted by the member (life-styling, thereby, reducing the return during pre-retirement period.)

Demographic: These are taken into consideration to assume the chances of missed contributions.

- Current\entry age of member
- Number of dependents in family
- Other sources of income: whether Spouse is salaried, self-employed or not working.
- Spouse Pension savings
- Retirement Age

Economic

- Annuity Interest rate
- Inflation rate
- State of economic Recession
- Investment return

Other

- Number of years missed contributions
- Number of years falling under Pre/Post-COVID Period

Assumptions

- Current Salary for all age groups: 25000/-
- Entry salary would be adjusted by the salary increase rate (historic)
- Employer and Employee Contribution rate: 3% and 5%, respectively as a fraction of employee's salary
- Salary Increase rate: 2.5% (Past and Future)
- The COVID Period would start from current age
- Entry age: 22
- Return on Fund: 5%
- Annuity Rate of Interest: 7%
- Price Inflation: 5%
- End of Retirement Age: 85 Years
- The effect has been modelled for ages 25,30,35, 40,45, 50 and 55
- Number of years missed contributions: Max 5 (Starting from Current Age)

Re-joining assumptions:

- The employee is assumed to rejoin, thereby, subject to a temporary leave of absence
- The salary is assumed to increase by wage inflation rate (Rate assumed prior the COVID Period).
- No change in Employee and Employer contribution rates, post COVID.
- No change in return on fund assumption post COVID.
- Pre-retirement period would start 10 years before the retirement age.
- Retirement age of 60 (Indian Standard).
- The post COVID period would hence depend on the number of years missed contributing towards the pension scheme:

  - **Retirement Age (Less) Current age (Less) Duration of missed contributions (Less) Duration Pre-Retirement Age**

- The pre-retirement period return on fund is assumed to decrease by 1.5% (Due to adjustment in investment strategy to bonds, thereby, providing a greater match/security and lower return).

- The current salary is assumed equal for all age groups; however, salary doesn't affect the output. Moreover, it is equal for all age groups to consider the inflation factor.
- Fixed Increases in Contribution rates Post COVID-19: 4%

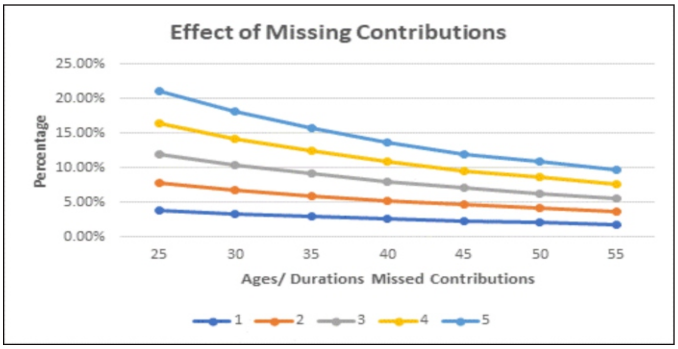
Output

- ### Effect of Missing Contributions

The current **effect of missing contributions** has been analyzed using this model where it could be seen that higher the number of missed contribution years, greater would be the effect on the fund value. Hence lower age group members face a greater shortfall as compared to older age cohort of members due to longer affected duration and the contributions were missed when the accumulated value was high.

Which could be follows:

Effect of missing Contributions							
Duration/Age	25	30	35	40	45	50	55
1	3.78%	3.34%	2.95%	2.61%	2.30%	2.05%	1.83%
2	7.76%	6.82%	6.00%	5.28%	4.66%	4.17%	3.72%
3	11.95%	10.45%	9.16%	8.04%	7.06%	6.35%	5.65%
4	16.37%	14.25%	12.43%	10.86%	9.51%	8.61%	7.64%
5	21.03%	18.21%	15.82%	13.77%	12.02%	10.94%	9.68%



The above analysis shows that if for instance a 25-year-old member miss contribution for 1 year, then the actual pension fund value would be 3.78% lower than should the member had not missed contributions.

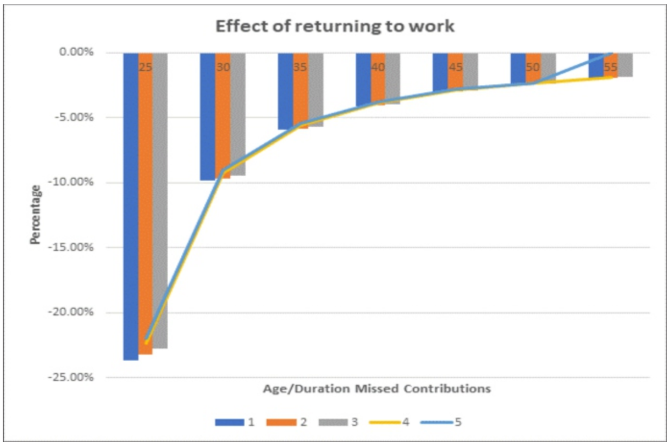
Whereas, comparing it with a 55-year-old member, missing contribution for 1 year lowers the pension pot by 1.83% which is lesser than a 25-year-old member.

The reason for same is same as discussed above: the loss of investment returns over longer period for younger members.

- ### Effect of Returning to Work

The **effect of returning to work** and starting to contribute again could be analyzed by estimating percentage reduction in the reduced fund value after missing contributions for at most 5 years. Which is as follows:

Effect of Returning to Work							
Duration/Age	25	30	35	40	45	50	55
1	-23.67%	-9.85%	-5.94%	-4.10%	-3.04%	-2.41%	-1.92%
2	-23.23%	-9.64%	-5.81%	-4.01%	-2.97%	-2.38%	-1.90%
3	-22.81%	-9.43%	-5.68%	-3.92%	-2.90%	-2.36%	-1.88%
4	-22.38%	-9.23%	-5.55%	-3.83%	-2.84%	-2.34%	-1.86%
5	-21.97%	-9.03%	-5.43%	-3.74%	-2.79%	-2.32%	0%

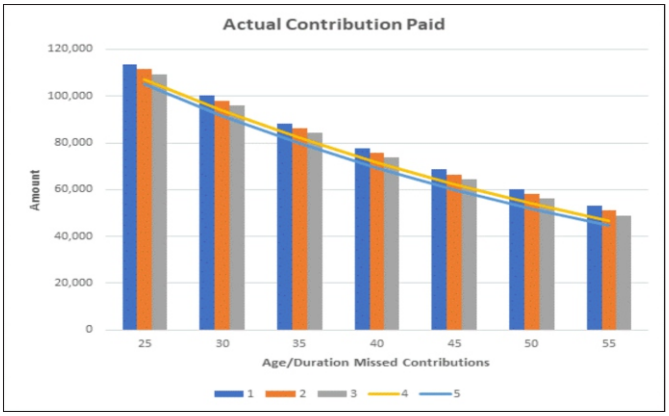


The negative values show a reduction in the reduced accumulated fund values due to missing contributions.

The above analysis show that younger members were benefited by a greater change in fund value on returning to work as the accumulation value is higher for younger relative to older members.

- ### Sum of contributions actually paid.

Actual Contribution Paid (£'s)							
Duration/Age	25	30	35	40	45	50	55
1	113,568	100,146	88,282	77,796	68,528	60,337	53,096
2	111,518	98,096	86,232	75,746	66,478	58,287	51,046
3	109,417	95,994	84,131	73,645	64,377	56,185	48,945
4	107,263	93,841	81,977	71,491	62,223	54,032	46,791
5	105,056	91,633	79,769	69,283	60,015	51,824	44,584



With an Increase in number of missed years there was a reduction in the actual contribution amount into the pension pot for all the age groups.

1. Determining the Required contribution amounts based on the Projected Fund Value and Replacement Ratio

• Projected Pension Fund value and Replacement Ratio

The **Projected Pension Fund** value and **Replacement Ratio** at entry age of 22 years is

Ages/Terms	Projected Fund Value at Entry Age	Projected Replacement Ratio at Entry Age
25	£ 292,347	24.99%
30	£ 258,392	24.99%
35	£ 228,381	24.99%
40	£ 201,856	24.99%
45	£ 178,411	24.99%
50	£ 157,689	24.99%
55	£ 139,374	24.99%

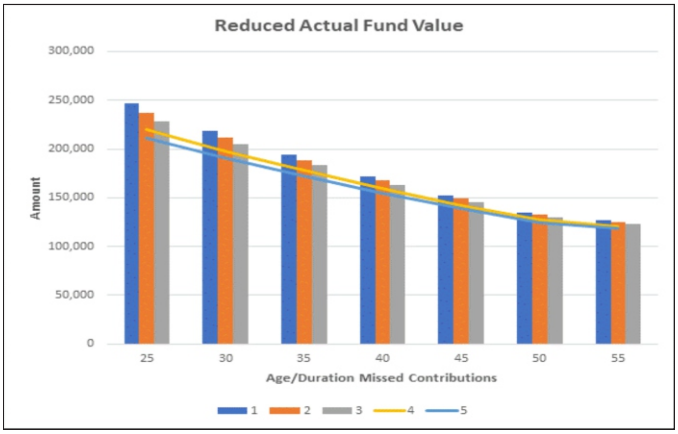
The Projected Pension fund value is different for different ages due to difference in entry age salary; however, the current salary is assumed equal for all the age groups.

Whereas, the projected replacement ratio at entry age is similar for all age groups because salary doesn't make any difference while calculating the replacement ratio.

• Reduced Actual Pension fund value and Replacement rate

A. Reduced Actual Fund at NRA

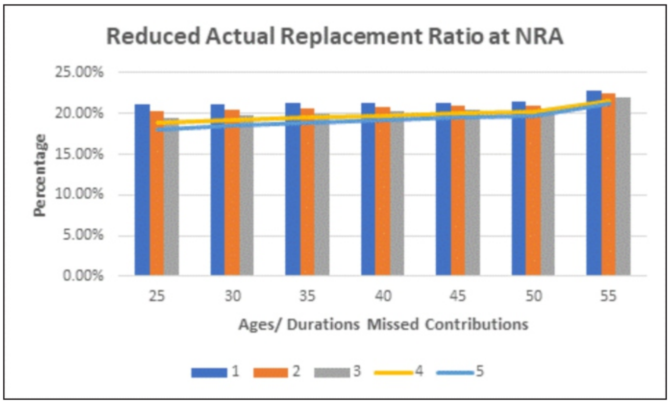
Reduced Actual Fund at NRA due to missing of contributions							
Duration/Age	25	30	35	40	45	50	55
1	£ 246,466	£ 218,775	£194,099	£172,129	£152,587	£135,197	£127,403
2	£ 237,365	£ 211,644	£188,511	£167,751	£149,157	£132,451	£125,091
3	£ 228,480	£ 204,683	£183,057	£163,477	£145,808	£129,731	£122,801
4	£ 219,807	£ 197,887	£177,732	£159,306	£142,539	£127,038	£120,533
5	£ 211,340	£ 191,254	£172,534	£155,233	£139,348	£124,370	£118,287



With an increase in the number of missed contributions, the higher the reduction in the actual fund value.

B. Reduced Replacement Ratio

Actual Replacement Ratio							
Duration/Age	25	30	35	40	45	50	55
1	21.07%	21.16%	21.24%	21.31%	21.37%	21.43%	22.84%
2	20.29%	20.47%	20.63%	20.77%	20.89%	20.99%	22.43%
3	19.53%	19.80%	20.03%	20.24%	20.42%	20.56%	22.02%
4	18.79%	19.14%	19.45%	19.72%	19.97%	20.13%	21.61%
5	18.07%	18.50%	18.88%	19.22%	19.52%	19.71%	21.21%

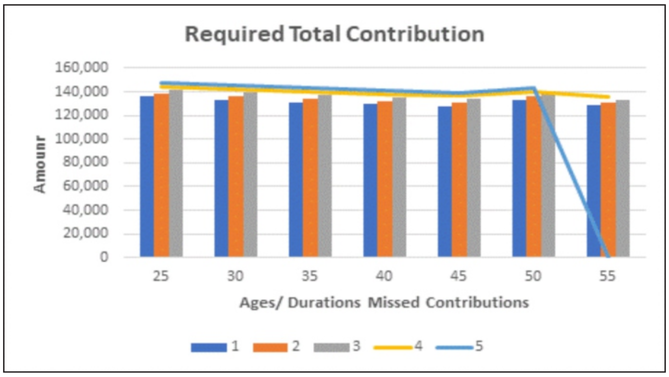


Citizens at 55 years of age experienced least change in the replacement ratio as compared to the projected ratio of 24.99% under different non-contributory durations as compared to other age groups. Which could be due to higher effect of missing contributions on younger members.

• Required Total Contribution Amount

The required total contribution amount (at increased rates) from both Employer and Employee to meet the replacement ratio so projected at entry age of 24.99%.

Increased Contribution amount required							
Duration/Age	25	30	35	40	45	50	55
1	£134,839	£132,427	£130,295	£128,410	£126,745	£133,498	£128,489
2	£137,691	£135,279	£133,147	£131,262	£129,596	£135,781	£130,715
3	£140,614	£138,202	£136,070	£134,185	£132,519	£138,110	£132,985
4	£143,610	£141,198	£139,066	£137,181	£135,515	£140,484	£135,300
5	£146,681	£144,269	£142,137	£140,252	£137,455	£142,905	£ 00 Not Required



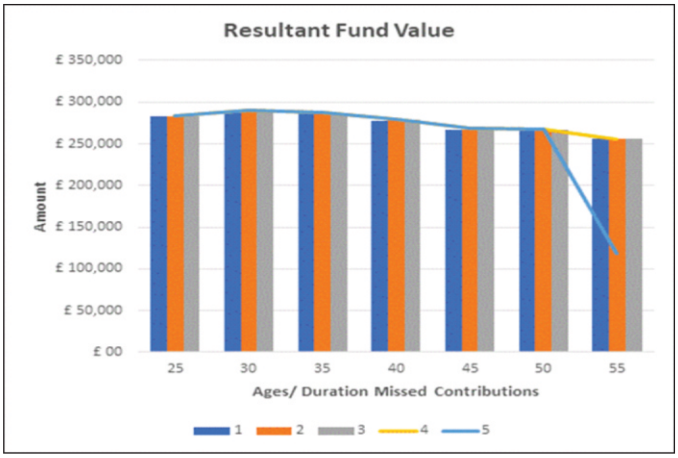
On looking the table vertically, increased Contributions are required with a raise in the number of non-contributory years.

However, on looking at the table horizontally a downward trend is experienced till age of 45 which further at 50 years of age and an unusual trend is accessed beyond 50 years of age due to shorter period prior retirement and missing of contributions during Pre-retirement period.

- **Resultant Fund Value and Replacement Ratio**

A. Fund Value + Previous Balance at last contribution miss age

Resultant Fund Value							
Duration/Age	25	30	35	40	45	50	55
1	£282,595	£288,902	£286,423	£278,119	£266,429	£266,997	£255,884
2	£282,838	£289,171	£286,744	£278,544	£267,098	£267,016	£255,900
3	£283,091	£289,455	£287,088	£279,014	£267,870	£267,035	£255,917
4	£283,355	£289,755	£287,459	£279,536	£268,776	£267,054	£255,934
5	£283,631	£290,073	£287,862	£280,121	£268,398	£267,074	£118,287 **No Increase**

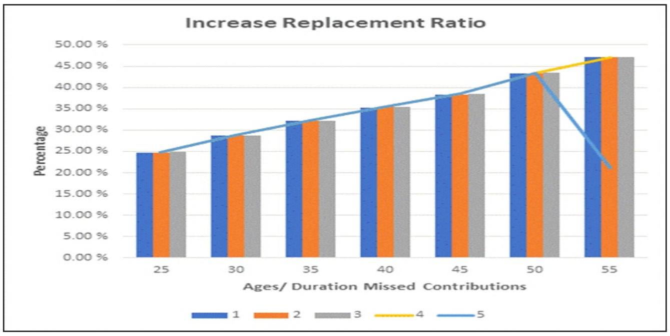


Vertical movement of fund value is increasing by increase in the number of non-contribution years. However, at age 45 + 5 missed contributions a reduction in the fund value is experienced due to fall in return on fund assumption with the start of pre-retirement period.

Whereas, on looking at the table horizontally, the fund value is increasing gradually with increase in age prior 30 where it peaks before starting to decrease thereafter.

A. Replacement Ratio: Increased Contributions

Increased Replacement Ratio							
Duration/Age	25	30	35	40	45	50	55
1	24.76 %	28.64 %	32.12 %	35.29 %	38.25 %	43.37%	47.027%
2	24.78 %	28.67 %	32.16 %	35.35 %	38.35 %	43.37%	47.030%
3	24.80 %	28.69 %	32.20 %	35.41 %	38.46 %	43.38%	47.033%
4	24.83 %	28.72 %	32.24 %	35.47 %	38.59 %	43.38%	47.036%
5	24.85 %	28.75 %	32.29 %	35.55 %	38.53 %	43.38%	21.21% **No Increase**



With an increase in the number of missed contributions and higher contributions required with age, there was a simultaneous increase in the resultant replacement ratio.

However, a slight hump is experienced at age 45 + 5 zero contributions due to a fall in the resultant fund value and a reduction in return on fund assumption.

2. Determining the Required contribution amounts based on Projected Fund Value and Final Salary Ratio of 5.1.

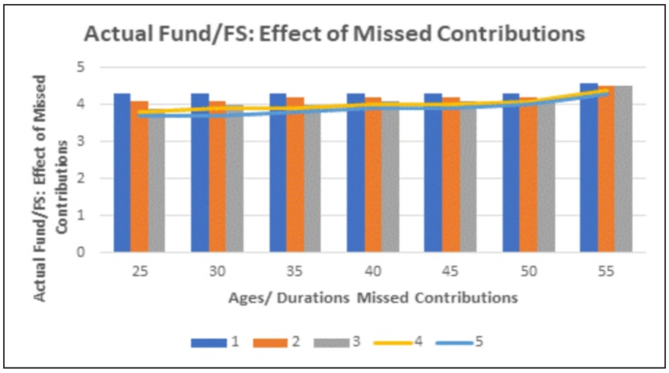
- **Final Salaries at different ages**

The salary assumption is similar for all age groups to reflect the inflationary effect due to which the final salaries are decreasing.

Ages/Terms	Projected Final Salaries
25	£ 57,883
30	£ 51,160
35	£ 45,218
40	£ 39,966
45	£ 35,324
50	£ 31,222
55	£ 27,595

- **Reduced Fund as a multiple of Final Salary due to missed contributions**

Actual Fund/FS: Effect of Missed Contributions							
Duration/Ages	25	30	35	40	45	50	55
1	4.3	4.3	4.3	4.3	4.3	4.3	4.6
2	4.1	4.1	4.2	4.2	4.2	4.2	4.5
3	3.9	4.0	4.0	4.1	4.1	4.1	4.5
4	3.8	3.9	3.9	4.0	4.0	4.1	4.4
5	3.7	3.7	3.8	3.9	3.9	4.0	4.3

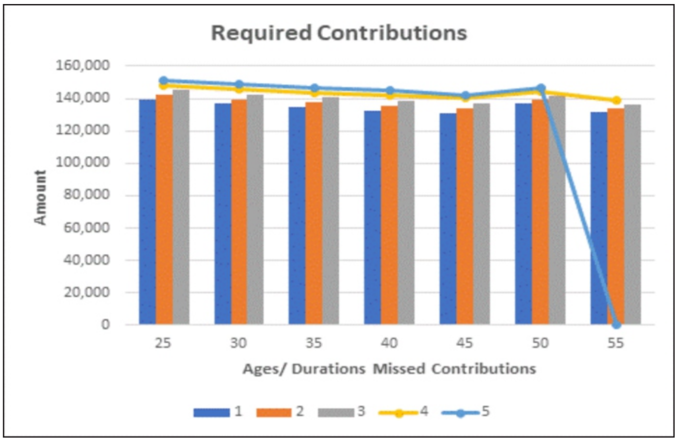


Downward trend is experienced under actual ratio of

Fund and Final Salary with an increase in the number of missed contributions.

- **Sum of Increased Contributions determined based on Projected Value of Fund and Final Salary ratio**

Increased Contributions Paid							
Ages/Durations	25	30	35	40	45	50	55
1	£137,957	£135,545	£133,413	£131,528	£129,862	£136,835	£131,702
2	£140,887	£138,475	£136,342	£134,458	£132,792	£139,176	£133,983
3	£143,890	£141,477	£139,345	£137,461	£135,795	£141,562	£136,309
4	£146,968	£144,555	£142,423	£140,539	£138,873	£143,996	£138,682
5	£150,123	£147,710	£145,578	£143,694	£140,897	£146,478	£ 00 No Increase

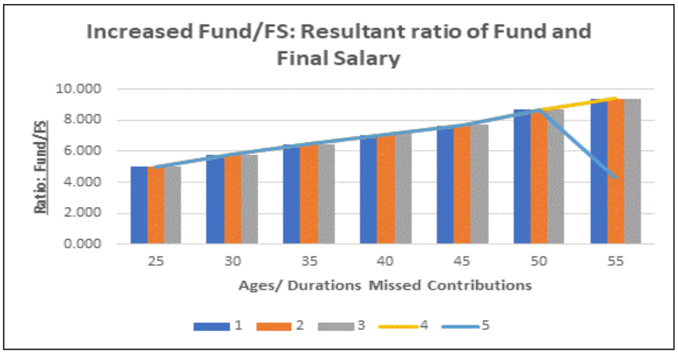


The sum of increased contributions is showing a gradual increase till 50 years of age where they peak before decreasing at age 55. The decrease is only due shorter time left for retirement age.

- **Resultant value of Fund and Ratio: Fund and Final Salary**

A. Fund as a multiple of Last Salary using Increased contributions

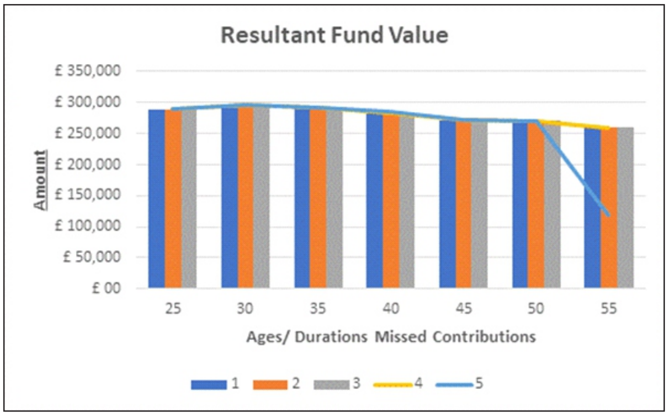
Increased Fund/FS: Resultant ratio of Fund and Final Salary							
Duration/Ages	25	30	35	40	45	50	55
1	4.991	5.756	6.444	7.070	7.655	8.676	9.397
2	4.995	5.761	6.451	7.081	7.675	8.677	9.398
3	4.999	5.767	6.459	7.093	7.697	8.678	9.399
4	5.004	5.773	6.468	7.106	7.723	8.678	9.399
5	5.009	5.780	6.477	7.121	7.714	8.679	4.300 No Increase



The ratio is increasing due to increase in the number of non-contributory ages. However, is increasing horizontally.

B. Increased Value of Fund

Increased Fund							
Duration/Ages	25	30	35	40	45	50	55
1	£288,871	£ 294,481	£ 291,391	£282,555	£270,415	£270,886	£259,323
2	£289,121	£ 294,758	£ 291,720	£282,992	£271,101	£270,906	£259,341
3	£289,381	£ 295,049	£ 292,074	£283,474	£271,895	£270,926	£259,358
4	£289,652	£ 295,357	£ 292,455	£284,011	£272,825	£270,945	£259,375
5	£289,935	£ 295,684	£ 292,869	£284,612	£272,480	£270,965	£118,287 No Increase



The fund value is increasing by a plus in number of missed contribution years (Vertical Movement), however, fund value decreases at age 45 + 5 zero contributions due to reduction in the return on fund assumption with the start of pre-retirement period.

Whereas, is increasing by an addition in age till 30 years where it peaks before starting to decrease thereafter.

Appendix

- Few assumptions such as a reduction in salary growth rate and contribution rates during post COVID-19 period were not assumed because they could cause a fall in personal disposable income and pension fund value, respectively.
- Which could further lead to current and future poverty, eventually a downfall in an economic activity. Moreover, a reduction in salary raise rate would even cause a fall in living standards.
- However, the model could allow such changes.
- The assumed retirement age is 60 (Indian Standard) and pre-retirement period would start 10 years before it.
- The model also assesses the effect of non-payment of contributions during pre-retirement period which is showing different results due to short time left for retirement.

- Moreover, missing contributions during pre-retirement period would create higher shortage for the member due to shorter period to retirement.
- Hence the required contribution rates are large, however amounts are less as compared to that of younger members.
- The replacement ratio and ratio of fund value and final salary also depends on the size of existing fund, hence missing of contributions at later age groups had higher existing fund value, thereby, increasing both the ratios with age.

However, the contribution rates were determined to achieve the projected replacement ratio and ratio of fund and final salary of 24.99% and 5.1 respectively under both the sets of output.

- Similar type of graphs was experienced under both the outputs.

Written by

Bhavya Goel

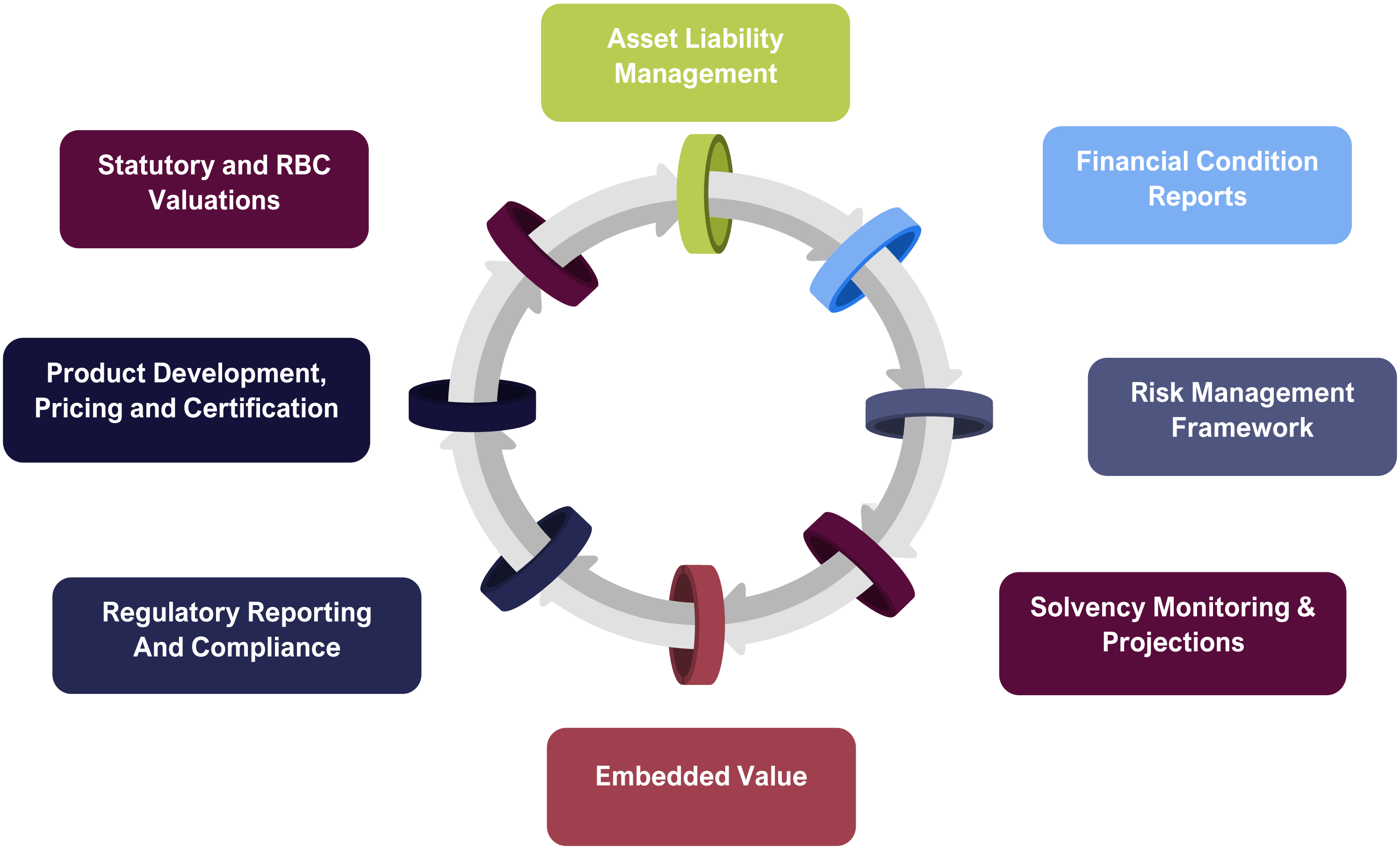
Bhavya.Goel@Cass.City.ac.uk

Bhavya Goel is a Pension enthusiast. He has done a lot of modelling work on Pensions. He is a MSc Actuarial Management graduate and a qualified MBA (Finance and Marketing).

M/s. K. A. Pandit
Consultants & Actuaries

Consulting Services - Life Insurance

Life insurers have been continuously striving to keep pace with the industry dynamics due to several changes on the economic, social, regulatory, legal, and political frontiers. Our team endeavours to provide support across the spectrum, including the major transition currently happening in the insurance industry.



ABOUT KAP

Established on 1st February 1943, we are a firm based in India with Indian values but integrated with modern processes which cater to serve all businesses globally. With the major objective of client satisfaction, we provide services to a large clientele around the world. The breadth of our core competencies, innovative solutions and leadership roles help in providing perceptible insights that give our service its competitive edge.

www.ka-pandit.com I +91-22-42922231 I kap@ka-pandit.com I LinkedIn

We work for you, wherever your business takes you!

RNI No. MAHENG/2009/28427
Published on 1st of Every Month

Postal Registration No. NMB/180/2020-22
Posting Date: 7th of Every Month

Posted at Mumbai Patrika Channel
Sorting office Mumbai - 400001