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Impact of Derivative Portfolios on Bank Stability

A.Karen Nisha* & R.Madhumathi**

Economic uncertainties impede the progress of a nation, whereas financial system stability fosters its growth. The paper analyses the impact of derivative portfolios on bank stability. The study uncovers evidences that Indian commercial banks reporting high total assets and high capital adequacy ratio and low non-performing assets exhibit the usage of derivatives. Higher credit risk induces banks to hedge their risk exposure. Derivatives hedged are found to foster bank stability than derivative trading. The Difference in Difference (DID) estimate model empirically validates the impact of interest rate derivatives used for hedging in strengthening the stability of banks. Robustness test using market returns confirms the impact of derivative use by banks in strengthening stability.

Keywords : Bank Stability, Derivatives, Hedging, Credit crisis, Difference in Difference Estimate.

Introduction

Economic uncertainties impede the progress of a nation, whereas financial system stability fosters its growth. Reserve Bank of India (RBI) defines financial stability as a persistent state of robust functioning of various financial system components such as institutions and market infrastructure, to enable the system to face any endogenous or exogenous financial shock with minimal disruptive impact (RBI, 2010). Bank risk essentially through investment banking activities have been identified as a major factor impacting the financial stability of banks worldwide. Regulations in the derivative markets have focused on the negative impact of derivatives on the financial value of firms, especially banking firms and the reason to investigate and monitor their role in affecting the financial stability of firms (Blundell-Wignall & Atkinson, 2011).

Derivatives are significant to the overall risk profile of banks. Banks in India use derivatives to manage risks and also offer these products to the corporate enterprises. These derivatives include

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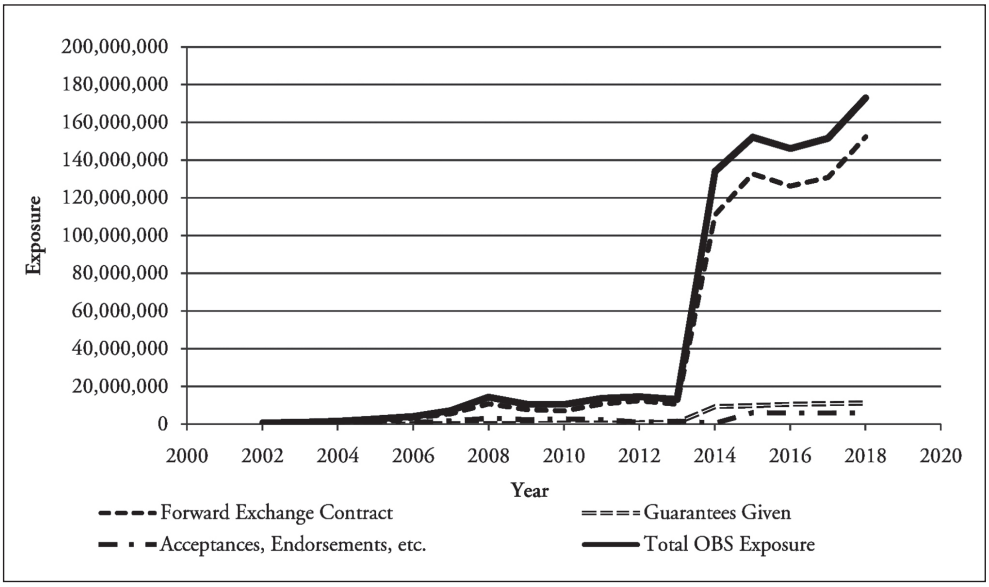
credit default swaps (CDS), interest rate derivatives (futures, options, swaps) and foreign exchange derivatives (futures, options) and, forward rate agreements. Since July 1999 RBI allowed banks to use forward rate agreements, interest rate swaps and interest rate futures. RBI further continued with the development of financial markets with the introduction of new instruments such as currency and bond futures with appropriate safeguards. Figure-1 projects the amount of growth in the total off-balance sheet exposure of Indian banks collectively across years. Out of the three categories that define the level of OBS exposure, forward exchange contracts have shown considerable growth in its usage by banks. Though there is an increase and immediate drop in the year 2008 (which might be the resilience action due to macroeconomic reforms of RBI in 2008), the forward exchange contracts form major part of total OBS and project a steep growth from the year 2012 onwards. This is a significant evidence for the increase in the usage of derivative by banks.

Banks are the financial intermediaries with highly levered balance sheets (Shiu & Moles, 2010). Their huge exposure encompasses credit risk (interest rate risk), and currency risk. Banks adopt balance sheet approach and hedging approach in mitigating their exposures. The former is linked with the repricing of maturity profiles of interest rate sensitive assets and liabilities of the bank's balance sheet. The latter is linked with hedging the interest rate risk and currency risk using derivatives (Kumar, 2017). Banks play dual role of its derivatives markets. They are intermediaries in the over the counter (OTC) market, matching sellers and buyers and earning commission fees, whereas become the end user by participating directly in derivatives markets as buyers and sellers of their protection. These financial activities of the banks result in the balance sheet as hedging position and trading position. Such activities are found to have soaring impact on the financial stability of banks (Mayordomo et.al, 2014 & Keffala, 2015).

Drawing reference from Nijskens and Wagner (2011) it can be said that credit risk transfer in banks has proved to be a risky activity. Also Wagner (2007) proved the hypothesis that using credit derivatives to increase liquidity in times of crisis, paradoxically, reduces stability of banks. The studies on encompassing derivatives and banks (Mayordomo et.al, 2014; Keffala, 2015 & Kumar, 2017) distinguish between trading and hedging positions of derivatives by banks mainly to find out their impact on bank stability.

Figure-1 : OBS Exposure of Indian Banks (₹ in crores)



Source : RBI database – Trends and Progress in Indian Banking Sector.

Academic research reinforces that bank stability is the outcome of prudent risk management. Hence, based on the risk dynamics of Indian banking system over a period of 2003 to 2016, this study aims to investigate the impact of derivatives on the stability of Indian banking system with reference to implementation of new prudential norms by RBI in the year 2008. To further diagnose this impact in the presence of regulatory framework, we find out the effect of derivatives activity on the stability of banks during and post-2008 by controlling for the period 2008 with a dummy for interaction in DID model. The rest of the paper has been organised as : Section-I providing a brief view of the past literature, Section-II elaborates the research hypotheses and presents a brief description of data, Section-III presenting the analyses and research findings and Section-IV summarizing the research.

Section – I

1. Theoretical Review

Literature on innovation in financial instruments especially derivatives provide us with the added riskiness to the firm which uses CDS, CLOs or any OTC derivatives. Banks began to use derivatives like futures and options mainly to hedge their stock return volatility (Guay, 1999) which turned out to be a method of investing and

hedging later. Banks diversify their balance sheet risk and off-balance sheet risk and the effect of using derivatives and its disclosure to public add value to the stock prices of respective banks (Venkatachalam, 1996). A contrary perspective towards general assumptions like use of derivatives helps reduce systematic risk of banks (Choi & Elyasiani, 1997) which has been established in the literature repeatedly during economic uncertainties. Shanker (1996) investigated the use of interest rate derivatives on the interest rate exposure of the commercial banks using the weekly returns of the banks' stocks and market returns to identify the use of interest rate derivatives' impact on the interest rate exposure of banks.

Banks are interdependent (Choi & Elyasiani, 1997) and hedging on OTC derivatives like Swaps, CDS and CLOs tend to make banks riskier rather than decreasing their risk (Nijskens & Wagner, 2011). Hence, Credit Risk Transfer (CRT) measures should be adopted prudentially before implementing to diversify the risk exposure of banks. Alnassar and Chin (2015) investigated the reasons for the use of credit derivatives (CDs) by banks in risk management and as their results suggest a bank's decision to use CDs as hedging instruments is positively and consistently associated with the size of banks, costs of financial distress, leverage (bank deposits), use of other risk management instruments and the level of exposure to risk and the same is negatively associated with the capital positions of the banks.

Sinkey and Carter (2001) reported that smaller banks are more likely to hedge whereas others argued that large firms go for hedging programmes since they have more resources. Sinkey and Carter (2001) also found that banks who use derivatives tend to have riskier capital structures (more notes and debentures and less equity capital), larger maturity mismatches between assets and liabilities, greater net loan charge-offs, and lower net interest margins. Patnaik and Shah (2002) estimated the interest rate risk of a sample of major banks in India. They studied the impact on equity capital of certain interest rate shocks and measured the elasticity of bank stock prices to fluctuations in interest rates. They found that as of 31 March 2002, many major banks had economically significant exposures. The study explored that two-thirds of the banks in the sample stood to gain or lose over 25 per cent of equity capital in the event of a 320 bps move in interest rates.

In the bank stability literature, we come across many authors who measure the stability of a firm using various techniques ranging from Altman's Z Score to Probability of bankruptcy by Black,

Scholes and Merton. The study of Berger, Klapper and Turk-Ariss (2009) which used three proxies for financial stability namely Z-index, ratio of non-performing loans to total loans and capital ratio found that banks with a higher degree of market power bear significantly more loan portfolio risk and banks with more market power enjoy less overall risk exposure. Keffala (2015) used Z scores (as in Fu et al., (2014)) for calculating bank stability and performed a study which explored that futures and especially options, weaken the stability of banks from emerging countries and concluded that only options and futures can be considered as risky derivatives and partly responsible in the intensification of the last financial crisis. Wagner (2007) theoretically proved that with the innovation in financial instruments (derivatives) the bank asset liquidity increases which in turn provides more risk appetite for banks. He also elaborated that this phenomenon in normal times does not affect stability, as measured by the bank's probability of default but contrast to the previous observation, an increase in asset liquidity in times of crisis, paradoxically, reduces stability of banks.

Shiu and Moles (2010) examined the determinants of derivatives use by using specific bank characteristic variables that proxy for the motivations and effects of banks participating in the derivatives markets. Banks' use of derivatives is found to be positively related to bank size, currency exposure, and issuance of preferred stock, while negatively related to leverage and diversification of long-term liabilities. Li and Yu (2010) examined the impact of derivatives activity on the performance of commercial banks based on panel data from 18 large U.S. bank holding companies (BHC). They found that in general the larger the notional values of non-traded derivatives, the more derivative positions held by banks meaning potentially better performance.

Srivastava and Srivastava (2010) conducted a study on interest rate derivatives' impact on back characteristics and found that ownership and size has significant impact on the use of interest rate derivatives in Indian banks. Sinha and Sharma (2016) and Hamdi *et. al* (2017) analysed the exposure of banks on using derivatives with many bank specific characteristics wherein, one of the highly impacted variable was the profitability (ROA) of banks. Hence, studies inevitably include the impact of derivatives on profitability of banks. Kumar (2017) found that interest rate risk is the driver for derivatives of Indian commercial banks. The asset size, and the impact of interest rate shock on equity capital are positively related to use of derivatives for hedging as well as trading and interest rate sensitivity

factor is negatively related to the use of derivatives for hedging and trading. The study explored that new generation private banks have relatively large exposure to derivatives for trading purpose. The differences in the results of the impact created by interest rate derivatives and lack of studies on the usage of currency derivatives by Indian commercial banks also prompted the researchers to probe in to the instability in banks during a credit crisis period and specifically through derivatives.

While Indian banks did not have a major impact of global financial crisis, they have been witnessing problems in 2007-08 due to their irregular selling of certain exotic derivative contracts to the exporters for which Reserve Bank of India enforced a maximum penalty, according to the Banking Regulation Act 1949, on 19 commercial banks for mis-selling illegal derivative products to exporters (Das, 2009 & Ninan, 2011). By the end of FY-2007-08, several exporters across the country started facing huge mark-to-market losses when the bankers started quoting the global financial crisis as the reason behind the fallout (Jain, 2014). Financial instruments such as interest rate swaps, CDs and CLOs for hedging the credit risk of non-performing assets of banks have been found to increase the total risk structure of banks (Das, 2009 & Ninan, 2011). The lack of literature on the effect of derivative usage during and post the (2008 onwards), particularly the traded and hedged derivative contracts by banks, on the stability of Indian commercial banks is a gap that if examined would direct towards better policy measures of risk management in the banking sector.

1.1. Motivation for the Work

1.1.1. Incentives to hedge

Despite the recognition of credit recovery problems in banks the pattern of risk management there is a need to understand the impact of derivative instruments exposure of banks. Hedging theory fundamentally argues that hedging leads to risk sharing. The theory also points out that hedging leads to acquisition of further risk that could destabilise the bank or the system. Cost of financial distress theoretically points out that bank hedging could hinder bank stability. Even though the hedge theory points out that firms would hold derivative contracts to hedge risks inherent in their positions and, in turn, to smooth their cash flows and profits (Guay & Kothari, 2003), the empirical evidence for commercial banks is rare.

1.1.2. Incentives to trade/speculate

Geczy, Minton and Schrand (2007) suggest in a survey study that firms view speculation as a profitable activity,

not merely a risk-seeking activity because they have information and cost advantages.

The growth in OBS (Table-1) is approximately equivalent to growth in forwards contracts of Indian commercial banks. Evidences on hedging the balance sheet risk and motivation to earn profit through speculation indicate that banks with lower profitability are more likely to assume risks or speculate using derivatives and make off-balance-sheet incomes to improve their profitability (Geczy, Minton & Schrand, (2007) and Sinkey and Carter (2000)).

Table-1 : Off-Balance Sheet Exposure of Scheduled Commercial Banks in India (₹ in Crores)

Year	Forward Exchange Contract	Guarantees Given	Acceptances, Endorsements, etc.	Total OBS Exposure
2001 - 2002	633124	84255	169140	886518
2002 - 2003	780748	90341	293079	1164169
2003 - 2004	1155747	101848	505687	1763283
2004 - 2005	1774450	123723	918851	2817024
2005 - 2006	3280179	161451	807911	4249542
2006 - 2007	5585256	219617	1626841	7431714
2007 - 2008	10871178	295506	3260685	14427370
2008 - 2009	7915211	417064	2339686	10671961
2009 - 2010	7155974	523177	2850808	10529958
2010 - 2011	10731529	673536	2433324	13838389
2011 - 2012	12634964	780319	1179633	14594916
2012 - 2013	10677968	869230	1711109	13258307
2013 - 2014	111003216	9274046	612192	133897725
2014 - 2015	132735637	9902166	6136918	152130319
2015 - 2016	126237754	10535696	5877434	146163403
2016 - 2017	130897821	10835651	5869784	151624064
2017 - 2018	152356669	11250329	5967668	172930844
Growth Rate (CAGR)	38%	33%	23%	36%

Source : RBI database – Trends and Progress in Indian Banking Sector.

A banking system's role in the economy is the transmission of monetary policy. Hence there is a need to evaluate the exposure of banks to interest rate shocks and the extent to which they hedge. Banks are major users of derivatives in terms of the gross notional exposures and hence there is a question of examining their hedge goals such that the stability of banks are not compromised.

Theoretically, given a core business risk (credit and interest rate risk) of a bank, hedging with derivatives should tend to reduce it (Guay, 1999). Contrasting to that Huan and Parbonetti (2019) suggest that banks' use of financial derivatives increased their risk. This increase in risk can be driven by banks' use of derivatives for speculative purposes, by sub-optimal hedging to obtain hedge accounting status, or from accounting mismatches that generate volatility in earnings.Empirically, without a model to controls for core business risk (credit and interest rate risk), the hedge relation cannot be proved. Literature on hedging behaviour suggests that the type of derivative instrument chosen by a bank depends on the risk exposure faced at a given situation.

Hence, the significant bank characteristics that determine the rationale for using derivatives are to be explored first to identify the core business risk of banks, followed by the investigation of impact of derivative activities on the financial performance of banks. Hence, the current study explores the impact of derivative activities (hedging and trading) on the performance and stability of banks in India.

Section – II

2. Methodology : Objectives and Hypotheses

2.1. Research Hypothesis

An examination of what drives banks to participate in derivatives, is the primary query to be answered. Theory of risk management suggests that reduction of business risk increases the value of the firm, hence, finding out which form of risk (bank characteristics) attracts more derivatives activity can be identified with the following hypothesis :

H1 : *There is a significant relationship between bank specific characteristics and derivatives usage.*

Since theory of hedging focuses only on diversifying risk and increasing profits, it is necessary to look into the speculative motive of derivative usage. Hence, examining how the derivatives would affect the performance of banks is considered to be another research query to be analysed. The probable correlation between impact of derivative

and bank performance is tested using second hypothesis :

H2 : *Financial derivative activities (trading and hedging) have significant impact on bank performance*

The dynamics of change in bank stability through the hedging process is examined in the third hypothesis :

H3 : *Hedged derivatives have more impact on the stability of banks than traded derivatives*

2.2. Research Methodology

2.2.1. Data

The data from the balance sheets of bank (ProwessIQ database) and the market index data were collected from NSE website. The period of study ranges between 2003 and 2016 including the period of implementation of macro-prudential reforms of RBI in response to the exposure of Indian banking system to the financial crisis of 2008-09. Therefore, for studying the specific impact of derivatives on bank stability, the years 2008 onwards were considered to be distinctive from previous years.

2.2.2. Sample

The study comprises of 49 scheduled commercial banks of India which are listed and traded in NSE between 2003 and 2016.

2.2.3. Variable description

Bank stability is measured as an accounting indicator popularly used in many studies as Z score. (Laeven & Levine, 2009; Hesse & Cihák, 2007; Fu et al., 2014 & Keffala, 2015). This accounting stability measures the relation between performance and standard deviations of return. The number of standard deviations by which bank returns would have to fall from the mean in order to wipe out bank equity. Indeed, higher values of stability would be indicative of lower probability of insolvency risk and greater bank stability. The accounting formula of bank stability is :

(STABILITY) = (Average ROA + (Equity / Total Assets))/Std. Deviation of ROA

The profit performance (ROA) and the latent variable (dummy) 'user of derivatives' also form part of the dependent. The dependent variables, namely bank stability; ROA and user dummy are explained with interest and control variables. Variables of interests are defined by the derivative instruments used by banks. This includes interest rate derivatives and currency derivatives used for trading (INTT and CXT) and hedging (INTH and CXH).

The control variables include both bank specific factors and market specific

variables. The size of the firm (L SIZE) is directly linked to the nature and growth of a firm. Bank size has been chosen as control variable since in most of the studies its influence on the dependent variable had been found to show significant results. The efficiency regulator i.e. capital adequacy ratio (CAR) represents the regulatory risk of a bank and its impact on the dependent variable. In most of the studies (Kumar, 2017); Li & Yu, 2010); and Hamdi *et. al,* 2017) CAR had positive impact on the bank performance exhibiting the safety of complying with regulatory norms. The credit risk indicator i.e. non-performing asset ratio (NPA) had been considered as a motivation for derivative use in banks.

The net interest margin (NIM) could indicate that banks with high earnings from credit activities might have increasing need for hedging. The ownership of bank (OWNER) is one such variable which has direct control over bank operations, size / capitalisation and discretion on derivatives usage. The liquidity ratio (LIQUIDITY) which is one of the exhibitors of the on-balance sheet risk can be considered as a determinant of derivative use since it represents the solvency position of a bank. The market specific variables are market capitalisation (LMCAP), the market returns of bank specific index (BANKEX) and the period of new prudential norms (TIME). Further details of the variables is provided in Appendix-1.

2.3. Panel Logit Regression

As the data has been arranged in panel form which is suitable for studying the dynamics of change in individual firms over a period of time, the study adapts panel data models as the technique of estimation. The testing of the *significant relationship between bank specific characteristics and derivatives usage* (H_1) applies panel logit model (with random effects) since the dependent variable (derivative use) is a categorical variable. The independent variables are the bank specific characteristics and market index.

2.3.1. Testing the relationship between bank characteristics and derivative usage

$$\text{Ln (User/NonUser)} = a + \beta_1 \text{ OWNER} + \beta_2 \text{ LSIZE} + \beta_3 \text{ LMCAP} + \beta_4 \text{ NPA} + \beta_5 \text{ NIM} + \beta_6 \text{ CAR} + \beta_7 \text{ LIQUIDITY} + \beta_8 \text{ ROA} + \beta_9 \text{ BANKEX} + \varepsilon_i$$

The second hypothesis (H2) which is proposed to predict the impact of financial derivatives activity on the performance of banks the random effect panel data model is used after running hausman test. The variance inflation factor test was run after introduction of new regressors namely INTT, INTH, CXT and CXH which are the adjusted notional price of financial derivatives. The variables LSIZE, LMCAP,

LIQUIDITY and BANKEX were found in multi-collinearity with other regressors, hence were eliminated in the final equation. This equation given below represents the impact of financial derivatives activities namely hedging and trading on the performance of banks while controlling for ownership, interest earnings, credit risk, and regulatory risk.

2.3.2. Testing the impact of derivatives on bank performance

$$ROA = a + \beta_1 INTT + \beta_2 INTH + \beta_3 CXT + \beta_4 CXH + \beta_5 OWNER + \beta_6 NPA + \beta_7 NIM + \beta_8 CAR + \varepsilon_i$$

Lambert *et. al* (2017) used DID model to explore how a bank's amount of insured deposits affects its stability and lending decisions during the financial crisis of 2008. Their DID estimates significantly proved that the increased deposit insurance coverage through U.S. Emergency Economic Stabilization Act in October 2008 effect was most distinct for affected banks that are low capitalized. The empirical analysis showed that an increase in the amount of insured deposits causes the affected banks to become more risky (destabilized) relative to the unaffected banks.

The testing of third and final hypothesis (H3) which is proposed to predict whether hedged derivatives have more impact on the stability of banks than traded derivatives during and post 2008 has been analysed using DID model to find out the distinguishing impact of hedged derivatives after the year 2008 in which new tightened macro-prudential norms were introduced by RBI. Here the Treatment Group would be User of Derivative (User) and the Control Group would be the Non-User of Derivative (Non-User). The user of derivatives are further categorised into users of interest rate derivatives traded and hedged and users of currency derivatives traded and hedged. The distinguishing period would be the Year after January 2008 (Time).

The independent variables used are the notional amount of interest rate derivatives and currency derivatives with special distinction to traded and hedged category and the control variables include bank specific variables and market index.

2.3.3. Difference in Difference Estimate

Overall Impact Model :

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 User + \beta_{10} TIME + \beta_{11} UserINTT + \beta_{12} UserINTH + \beta_{13} UserCXT + \beta_{14} UserCXH + \beta_{15} DID1(TIME*User) + \beta_{16} DID2 (TIME*UserINTT) + \beta_{17} DID3$$

$(TIME*UserINTH) + \beta_{18}DID4 (TIME*UserCXT) + \beta_{19}DID5 (TIME*UserCXH) + \varepsilon_i$

The third hypothesis is analysed using six model equations with the titles – Common impact, IRD trading impact, IRD hedging impact, CRD trading impact, CRD hedging impact and Overall impact (see Appendix-2 for first five equations). The coefficients of the new variable DID show the interaction between period of crisis and user of specific type of derivative. DID1 (TIME*User of any derivative), DID2 (TIME*User of INTT), DID3 (TIME*User of INTH), DID4 (TIME*User of CXT) and DID5 (TIME*User of CXH) represent the interaction between period of crisis and user of any one form of the derivatives chosen in the study. This interaction would allow us to know the difference between user and non user of derivatives before and after the period of crisis. Even though the financial crisis began by July 2007, the real impact was felt from January 2008; hence for interaction effect the year 2008 has been used.

Section-III

3. Results : Findings and Analysis

Table-2 provides the descriptive statistics of the variables used in the study. The left side variables are control variables of the study and the right side variables include the dependent variables (stability and ROA) and major explanatory variables of the study. It can be observed from the above table that stability, size, CAR, NPA and ROA are widely spread over (standard deviation)

Table-2 : Descriptive Statistics Std. Dev.

Variables	Observations	Mean	Std. Dev.	Variables	Observations	Mean	Std. Dev.
OWNERSHIP	686	0.5510	0.4978	STABILITY	628	5.9238	6.5877
LSIZE	642	12.9537	2.2741	ROA	625	0.8693	1.5575
LMCAP	497	10.8012	1.3409	INTH	686	0.0072	0.0196
NPA	600	1.8407	1.6514	INTT	686	0.1023	0.3506
NIM	420	3.017	0.9512	CXH	686	0.0195	0.0593
CAR	476	12.9829	2.3002	CXT	686	0.0951	0.7254
LIQUIDITY	531	3.4947	1.6958				
ART	467	0.1312	0.5420				
BANKEXRET	686	0.00000000098	-0.6633				

from mean with huge values representing their importance in this study. Accordingly outliers have been winsorized during analysis to make the data normal and suitable for analysis.

3.1. Bank Motivation for Derivative Use

Table-3 represents the results for Random Effect Logit regression performed for identifying the determinants for usage of derivatives in Indian banking sector. The regression was performed after confirming with the results of Hausman Test. The dependant variable is the dummy variable which categorises a bank as user or non-user of either interest rate derivative or currency derivative. It takes value one if the bank uses any one form of derivative otherwise zero. The variable NIM is negatively significant at ten per cent. Hence, the results show that banks with high interest earnings are less likely to use financial derivatives. The capital adequacy ratio (CAR) is positively significant. Hence, the banks which comply to regulatory risk management by maintaining adequate capital regulations are more likely to use derivatives and it indicates the risk taking ability of banks which are have less exposure to insolvency as per Basel-II norms. Similar to CAR, even the BANKEX is positive and significant indicating the likelihood ratio of banks to use derivatives, whose market indices are highly profitable for investors. Therefore, it is inferred that banks with sufficient interest earnings are less likely to use derivatives and vice versa.

3.2. Correlation between Derivative Activities and Bank Performance

To measure whether effect of derivatives activities namely trading and hedging have any impact on the performance of banks, the panel regression has been used. After running Hausman

Table-3 : Determinants for Using Derivatives

Variables	OWNER	LSIZE	LMCAP	NPA	NIM	CAR	LIQUIDITY	ROA	BANKEX	Constant
DV : User of Derivatives	-1.241 (-0.79)	1.444* (2.16)	0.467 (1.02)	-0.440 (-1.41)	-1.134* (-2.33)	0.410** (2.88)	-0.345 (-1.49)	0.547 (0.45)	1.179* (2.13)	-21.46** (-2.81)
Wald Chi square Statistics = 20.43										

*Note : Bold values denote the significant margins with ***p<0.001, **p<0.05, *p<0.01. Values between parentheses denote Z statistics.*

test, the random effect model has been found appropriate for testing this hypothesis. The ROA of the banks has been taken as dependent variable to study the bank performances and regressed with the adjusted notional prices of financial derivatives of banks to their total assets. It is observed from the results that INTH is positively significant which signifies hedging on interest rate derivatives tend to increase the performance of banks by increasing their level of profitability (Table-4). The control variables NIM and CAR are positive and significant and NPA is negatively significant satisfying the general expectations of their financial nature.

Hedging plays a significant role than trading in contributing towards the bank profitability.Among the two derivatives of the study the interest rate derivatives which are suitable to manage the credit risk of banks are found more impactful on bank performance than the currency derivatives.

3.3. Impact of Derivatives on Bank Stability

For assessing the impact of derivatives on the bank stability, we use Difference in Difference Estimate. The dependant variable in the models is STABILITY which represents the scores calculated from the equation of Bank Stability. In all, the models the variable NPA remains negatively significant for bank stability. This represents that large non-performing assets have negative impact on the stability of banks. The results of each hypothesis are as follows :

3.3.1. Common impact model

In the common model, except the bank specific variables NPA and BANKEX, no other variable is significant representing no impact of the common effect on using derivatives in general. The highly significant NPA shows that increase in nonperforming assets makes banks highly unstable (Table-5). The increase in returns of market index (BANKEX)

Table-4 : Impact of Financial Derivative Activities on Bank Performance Using Random Effect Model

Variables	INTT	INTH	CXT	CXH	OWNER	NPA	NIM	CAR	Constant
DV : ROA	0.0318 (0.44)	2.991* (2.35)	-0.145 (-0.52)	2.450 (1.01)	0.258 (1.12)	-0.212* (-2.53)	0.216*** (3.46)	0.0384* (2.41)	-0.350 (-0.74)
Wald Chi square Statistics = 61.47									
*Note : Bold values denote the significant margins with ***p<0.001, **p<0.05, *p<0.01. Values between parentheses denote Z statistics*									

Table-5 : Measuring Impact of Derivatives on Bank Stability During and Post-Financial Crisis

Variables	Common Impact	IRD Trading Impact	IRD Hedging Impact	CRD Trading Impact	CRD Hedging Impact	Overall Impact
OWNER	0.354153 (-0.2061)	-0.22248 (-0.1257)	0.540739 (-0.3097)	-0.43113 (-0.2370)	0.486889 (-0.2656)	-0.53559 (-0.3041)
SIZE	0.433396 (-0.463)	0.905105 (-1.0246)	0.909047 (-1.0767)	0.944895 (-0.8459)	0.237815 (-0.2064)	0.799995 (-0.6504)
LMCAP	0.890681 (-1.4018)	0.935358 (-1.4961)	0.787705 (-1.2433)	0.924051 (-1.4107)	0.916875 (-1.326)	0.878533 (-1.5004)
NPA	-1.626722*** (-4.1184)	-1.695516*** (-4.6957)	-1.744849*** (-4.6526)	-1.660947*** (-4.8401)	-1.616792*** (-4.2449)	-1.464421*** (-4.3883)
NIM	1.352571 (-1.3816)	1.036314 (-1.2433)	1.062294 (-1.2322)	1.172999 (-1.4186)	1.102824 (-1.3941)	0.890937 (-1.2624)
CAR	0.140994 (-0.2756)	0.222499 (-0.4887)	0.392973 (-0.7742)	0.253184 (-0.4805)	0.096033 (-0.1859)	0.418872 (-0.8235)
LIQUIDITY	-0.55316 (-1.7845)	-0.5793 (-1.9368)	-0.638187* (-2.1319)	-0.52935 (-1.8927)	-0.60305 (-1.7929)	-0.40034 (-1.6433)
BANKEX	-0.870707* (-2.2812)	-0.57363 (-1.4885)	-0.976831* (-2.4172)	-0.58279 (-1.4745)	-0.63071 (-1.4055)	-0.916466* (-2.1163)
USER	2.6618 (-1.4964)					
TIME	3.214703 (-1.7045)	1.563049 (-0.8075)	4.739464* (-2.351)	1.42721 (-0.7987)	1.516444 (-1.1709)	5.428073** (-3.0359)
DID1(TIME* User)	-3.03826 (-1.1177)					
UserINTT		-0.3842 (-0.2499)				-2.988509** (-2.8377)
DID2 (TIME* User of INTT)		-1.50012 (-0.6486)				1.195621 (-0.5037)
UserINTH			3.526420* (-2.3186)			5.145267*** (-3.5872)

(Contd...)

DID3 (TIME* User of INTH)			6.310523** (3.0765)			6.796592*** (3.8893)
UserCXT				0.107811 (-0.0463)		0.161728 (-0.0682)
DID4 (TIME* User of CXT)				-2.23171 (-0.8725)		-2.2196 (-0.7257)
UserCXH					1.790929 (-0.9438)	2.359691 (-1.4834)
DID5 (TIME* User of CXH)					-1.05235 (-0.4448)	0.248268 (-0.0776)
Constant	-13.2995 (-0.9799)	-17.4026 (-1.4039)	-20.8806 (-1.6687)	-18.8649 (-1.1738)	-8.43633 (-0.4990)	-21.3994 (-1.2787)
R Squares	0.6052	0.6201	0.6067	0.6191	0.6052	0.6392
Observations	197	197	197	197	197	197

*Note : Bold values denote the significant coefficients with ***p<0.001, **p<0.05, *p<0.1. Values between parentheses denote t-statistics.*

denotes a negative impact on the stability of banks. The coefficient of study variable DID1 which is expected to show the impact of using derivatives in common on bank stability during and after 2008 seems to be insignificant. Hence, there is no common impact of derivatives on the bank stability.

3.3.2. IRD trading impact model

This model shows the impact of interest rate derivatives used for trading on the bank stability through the coefficient of the variable DID2. Similar to the previous model except NPA, no other variable is significant in this model as well.

3.3.3. IRD hedging impact model

The coefficient of DID3 confirms the impact of interest rate derivatives used for hedging on the bank stability. In this model the coefficient of DID3 is positively significant at five per cent confirming a healthy impact of hedging on interest rate derivatives on the soundness of bank health. The NPA, LIQUIDITY and BANKEX are negatively significant showing the negative impact of high non-performing assets; high liquidity and increase in return of market index on the bank which hedge on interest rate derivatives. The study variable DID is found significant only in this model when compared with all other models.

3.3.4. CRD trading impact model and CRD hedging model

The coefficients of DID4 and DID5 both remain insignificant in this model except the variable NPA which has similar expected negative impact on the bank stability in all other models. Hence, the currency derivatives used for trading and hedging do not seem to be having any kind of impact in their models.

3.3.5. Overall impact model

This model equation encompasses the DID variables in chronological order from DID2, DID3, DID4 and DID5 to check the overall effect of all derivatives chosen for study.Similar to common impact model, even in this model, the bank specific variables NPA and BANKEX have negative impact on bank stability. The current model serves as the reconfirming model to the results of IRD hedging impact model.

In this regression, the coefficient of DID3 is not just significant but highly significant at one per cent. Hence, once again, the user banks which hedge on interest rate derivatives are found to be strong in terms of bank stability. While observing the DID estimates, the results show that at individual and overall regression, hedging on interest rate derivatives has strengthened the banks during and post-2008. This shows that the activity of hedging on derivatives strengthened banks during and post-2008. Therefore, it is revealed from the results that interest rate derivatives and in specific hedging on them had made Indian banking system stable during and post -2008. It is evident from our analysis that more than trading of derivatives, hedging on derivatives had provided positive effect on the bank stability during and post the tightening of macro prudential norms by RBI.

In most of the cases our results have shown consistency with the previous studies (Table-6). With regard to the independent variables of the study, namely derivatives; not all of them have been significant like previous studies which might be because of the variation in country level aspects as these results are specific to Indian commercial banks. In specific, the hedging on interest rate derivatives are found to be safe during and post crisis which is the consistent result of Li and Yu (2010); Shiu and Moles (2010) and Keffala (2015).

3.4. Consistency in Results

While checking the study results with previous studies, we come across few similarities with past studies. The NPAs are negatively significant consistent to previous studies Shiu and Moles (2010), Kumar (2017) and Keffala (2015) whereas profitability had given a positive impact to bank stability and use of derivatives which is different from the previous results.

Table-6 : Comparison of Results with Previous Studies

Variables	User of Derivatives		Present Study	ROA		Present Study	STABILITY		Present Study
	Positive	Negative	Results	Positive	Negative	Results	Positive	Negative	Overall Results
INTT				-	Li and Yu (2010)	Not significant	Shiu and Moles (2010);	Keffala (2015)	(-)*
INTH				Li and Yu (2010)	-	(+)*	Shiu and Moles (2010);	Keffala (2015)	(+)*
CXT				-	Li and Yu (2010)	Not significant	Shiu and Moles (2010);	Keffala (2015)	Not significant
CXH				Li and Yu (2010)	-	Not significant	Shiu and Moles (2010);	Keffala (2015)	Not significant
LSIZE	Kumar (2017); Shiu and Moles (2010);		(+)*	Li and Yu (2010);	Hamdi et.al (2017)		Berger et.al, (2009); Shiu and Moles (2010); Berger, Klapper and Turk-Ariss (2009); Li (2014)	Fu et.al, (2014)	Not significant
LMCAP	Kumar (2017)		Not significant						Not significant

(Contd...)

CAR	Kumar (2017)		(+)**	Li and Yu (2010); Hamdi et.al (2017)		(+)*	Li and Yu (2010)	Keffala (2015)	Not significant
NPA		Kumar (2017);	Not significant			(-)*	Lambert et.al, (2013);	Venkatachalam (1996); Berger, Klapper and Turk-Ariss (2009); Li (2014)	(-)***
NIM	Shiu and Moles (2010);		(-)*			(+)*** (2014);	Keffala (2015); Fu et.al,		Not significant
OWNER			Not significant			Not significant	Berger, Klapper and Turk-Ariss (2009)		Not significant
LIQUIDITY	Kumar (2017);	Shiu and Moles (2010);	Not significant		Hamdi et.al (2017)				(-)*
BANKEX			(+)*						(-)*
TIME					Hamdi et.al (2017)		Fu et.al, (2014)		(+)*
*Grey cells indicate the variables not used in the respective regression									

Studies of Venkatachalam (1996), Choi and Elyasiani (1997) and Nijskens and Wagner (2011) had showed results either hedging or trading on derivatives reduces the risks of banks like currency exposure, systematic risk or idiosyncratic risk specific to a banks and partially similar is the results of our study with them by providing results that use of hedging on interest rate derivatives stabilizes banks.

3.5. Implications and Conclusion

The derivative use by Indian commercial banks declined in both traded and hedged exposures during the period 2007 to 2009. Though similar to previous studies on bank stability, our study slightly varies in its contribution to the existing knowledge by including currency derivatives and its focus on the initiatives of RBI to stabilise the financial system rather than highlighting the financial crisis. Hedged exposures of banks in interest rate derivatives have a positive impact on bank stability during and post the implementation of new prudential norms.

Wagner (2007) established that credit derivatives make banks riskier during crisis is not applicable in the Indian context. The hedged positions have addressed the risk reduction objective of banks than the trading or investment exposures of banks in derivatives. The findings suggest that using derivatives, in specific, trading on them may be highly riskier for banks. This can be an eye opener for banks that assume more risk through derivative trading as this could lead to asset liquidation. The robustness test using market returns as the dependent variable also provides similar results and confirms the impact of derivative use by banks in strengthening stability.

The results of the study might also help the Central Bank of India to decide on permitting to trade on derivatives according to their bank specific characteristics and financial capacity. The study does involve few limitations like restricted types of derivatives chosen and specific to single country. Hence, the results are also applicable based on these restrictions. The study can further be extended by specifying in detail the types of derivatives like CDS, CLOs etc., which are highly used by banks to hedge the risk of their customers and examine the results, during and post credit crisis to get better understanding of the impact of derivative on banks.

References

Alnassar, W.I., & Chin, O.B. (2015), "Why banks use credit derivatives?" Review paper, *Procedia Economics and Finance*, Vol.26, pp.566-574.

Berger, A.N., Klapper, L.F., & Turk-Ariss, R. (2009), "Bank competition and financial stability", *Journal of Financial Services Research*, Vol.35(2), pp.99-118.

Blundell-Wignall, A., & Atkinson, P. (2011), "Global SIFIs, derivatives and financial stability", *OECD Journal : Financial Market Trends*, 2011(1), pp.167-200.

Choi, J.J., & Elyasiani, E. (1997), "Derivative exposure and the interest rate and exchange rate risks of US banks", *Journal of Financial Services Research*, Vol.12 (2-3), pp.267-286.

Das, Satyajit. (2009), "How to design derivatives that dazzle andobfuscate", *Financial Times*, 8th July, 2009.

Fu, X.M., Lin, Y.R., & Molyneux, P. (2014), "Bank competition and financial stability in Asia Pacific", *Journal of Banking and Finance*, Vol.38, pp.64-77.

Géczy, C.C., Minton, B.A., & Schrand, C.M. (2007), "Taking a view : Corporate speculation, governance, and compensation", *The Journal of Finance*, Vol.62(5), pp.2405-2443.

Guay, W.R. (1999), "The impact of derivatives on firm risk : An empirical examination of new derivative users", *Journal of Accounting and Economics*, Vol.26(1), pp.319-351.

Guay, W., & Kothari, S.P. (2003), "How much do firms hedge with derivatives?", *Journal of Financial Economics*, Vol.70(3), pp.423-461.

Hamdi, H., Hakimi, A., & Zaghdoudi, K. (2017), "Diversification, bank performance and risk : Have Tunisian banks adopted the new business model?", *Financial Innovation*, Vol.3(1), p.22.

Hesse, H., & Cihak, M. (2007), "Cooperative banks and financial stability", International Monetary Fund.

Huan, X., & Parbonetti, A. (2019), "Financial derivatives and bank risk : evidence from eighteen developed markets", *Accounting and Business Research*, pp.1-28.

Jain, Vaibhav. (2014), "Financial Perspective on Foreign Exchange Derivatives : India and Abroad", Mondaq. http://www.mondaq.com/india/x/326218/Commodities+Derivatives+Stock+Exchanges/Financial+Perspective+On+Foreign+Exchange+Derivatives+India+And+Abroad

Kumar, D. (2017), "Factors impacting the interest rate derivatives usage in Indian commercial banks," *Theoretical Economics Letters*, Vol.7(03), p.596.

Keffala, M. R. (2015), "How using derivatives affects bank stability in emerging countries? Evidence from the recent financial crisis", *Research in International Business and Finance*, Vol.35, pp.75-87.

Lambert, C., Noth, F., & Schüwer, U. (2017), "How do insured deposits affect bank risk? Evidence from the 2008 Emergency Economic Stabilization Act", *Journal of Financial Intermediation*, Vol.29, pp.81-102.

Laeven, L., & Levine, R. (2009), "Bank governance, regulation and risk taking", *Journal of Financial Economics*, Vol.93(2), pp.259-275.

Li, L., & Yu, Z. (2010), "The impact of derivatives activity on commercial banks : Evidence from US bank holding companies", *Asia-Pacific Financial Markets*, Vol.17(3), pp.303-322.

Mayordomo, S., Rodriguez-Moreno, M., & Peña, J.I. (2014), "Derivatives holdings and systemic risk in the US banking sector", *Journal of Banking & Finance*, Vol. 45, pp.84-104.

Nijskens, R., & Wagner, W. (2011), "Credit risk transfer activities and systemic risk : How banks became less risky individually but posed greater risks to the financial system at the same time", *Journal of Banking & Finance*, Vol.35(6), pp.1391-1398.

Ninan, Oommen. (2011), "Mis-selling of derivative products : RBI acts", https://www.thehindu.com/business/Economy/misselling-of-derivative-products-rbi-acts/article1983530.ece

Patnaik, I., & Shah, A. (2002), "Interest rate risk in the Indian Banking system," Indian Council for Research on International Economic Relations.

Reserve Bank of India (2010), Financial stability report. http://www.rbi.org.in

Shanker, L. (1996), "Derivatives usage and interest rate risk of large banking firms", *Journal of Futures Markets*, Vol.16(4), pp.459-474.

Shiu, Y.M., & Moles, P. (2010), "What motivates banks to use derivatives : Evidence from Taiwan", *The Journal of Derivatives*, Vol. 17(4), pp.67-78.

Sinkey, J.F., & Carter, D.A. (2001), "Evidence on the financial characteristics of banks that do and do not use derivatives", *The Quarterly Review of Economics and Finance*, Vol.40(4), pp.431-449.

Sinha, P., & Sharma,. 2016), "Derivative use and its impact on systematic risk of Indian banks : Evidence using Tobit model", Munich Personal RePEc Archive Paper.

Srivastava, S., & Srivastava, D. (2010), "Interest rate derivatives in Indian banks", *Serbian Journal of Management*, Vol.5(1), pp.111-125.

Venkatachalam, M. (1996), "Value-relevance of banks' derivatives disclosures", *Journal of Accounting and Economics*, Vol.22(1), pp.327-355.

Wagner, W. (2007), "The liquidity of bank assets and banking stability", *Journal of Banking & Finance*, Vol.31(1), pp.121-139.

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Appendix – 1 : Description of the Variables Used for Study

The measure / proxy for each independent and control variable is given in the following table below:

	Variables	Measures	Notation	Expected Sign
Bank Stability	Calculated stability Scores	Stability = (Average ROA + (Equity / Total Assets)) / Std. Deviation of ROA	STABILITY	+
Independent Variable	Currency derivatives (Traded)	The notional amount of Forex derivatives divided by the total assets	CXT	-
	Interest rate derivatives (Traded)	The notional amount of Interest rate derivatives divided by the total assets	INTT	-
	Currency derivatives (Hedged)	The notional amount of Forex derivatives divided by the total assets	CXH	-
	Interest rate derivatives (Hedged)	The notional amount of Interest rate derivatives divided by the total assets	INTH	-
Bank Specific Variables	Size	Natural log of total assets	LSIZE	+/-
	Market Capitalisation	Natural log of total market capitalisation	LMCAP	+/-

(Contd...)

	Capital Adequacy	Capital Adequacy Ratio	CAR	+/-
	NPA ratio	The ratio of Net non-performing assets to Loans given	NPA	-
	Net Interest Margin	Net interest income (Profitability of a bank)	NIM	+/-
	Ownership	Publicly owned or Privately Owned	OWNER	+/-
	Liquidity	Ratio of liquid assets to liquid liabilities of the bank	LIQUIDITY	+/-
	Return on Assets	Ratio of net income to total assets	ROA	+
Market Level Variables	Market returns	Bank Sector Index (NSE India)	BANKEX	+/-
Distinguishing Period	Period of new prudential norms	2008 onwards	TIME	+/-

Appendix-2

1. Common Impact Model

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 User + \beta_{10} TIME + \beta_{11} DID1(TIME*User) + \varepsilon_i$$

2. IRD Trading Impact Model

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 TIME + \beta_{10} UserINTT + \beta_{11} DID2 (TIME*UserINTT) + \varepsilon_i$$

3. IRD Hedging Impact Model

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 TIME + \beta_{10} UserINTH + \beta_{11} DID3 (TIME*UserINTH) + \varepsilon_i$$

4. CRD Trading Impact Model

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 TIME + \beta_{10} UserCXT + \beta_{11} DID4 (TIME*UserCXT) + \varepsilon_i$$

5. CRD Hedging Impact Model

$$STABILITY = \alpha_0 + \beta_1 OWNER + \beta_2 LSIZE + \beta_3 LMCAP + \beta_4 NPA + \beta_5 NIM + \beta_6 CAR + \beta_7 LIQUIDITY + \beta_8 BANKEX + \beta_9 TIME + \beta_{10} UserCXH + \beta_{11} DID5 (TIME*UserCXH) + \varepsilon_i$$

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Coverage of Indian Management Publications in Scopus – An Analytical Note

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This analytical note presents a panoramic view of the Indian management literature indexed in Scopus over the past two decades. The analysis shows that less than 20 per cent of our scholarly management journals are indexed in Scopus. Indian management literature, including those published in foreign journals, make up a small proportion of the total under various sub-categories of management. Though overall citedness of our contributions is high, citation intensity is relatively low with less than 20 per cent of the articles obtaining 10 or more citations. As of now the relatively better internationally intertwined sub-categories of Indian management scholarship are in the areas of Management of Technology and Innovation, Management Information Systems, and International Management.

Keywords : Indian Management; Management Literature; Citation Index; Scopus Indexed Publications.

Introduction

Academic establishments, accrediting agencies, and country competitiveness ratings around the world are increasingly interested in assessing the quality of scholarly output. Most judgments about research are based on perceived quality of the publications. This analysis looks at the extent of management literature indexed in Scopus. Scopus is a citation index. Citations are references cited in the scholarly documents by the authors to substantiate their arguments. Citation analysis is a way of measuring the relative importance or impact of an author, an article or any other citable publication by counting the number of times that author, article, or publication has been cited by other works. Frequency of citation leads to measure of impact and quality.

Scholarly literature is increasing at an exponential rate and citation index is a labour intensive enterprise. As sustaining such an effort is a challenging task, citation indices limit the sources they

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index. Journals that are selected for indexing are considered to be quality sources. Because of this, publication in journals indexed in Scopus is in itself deemed as quality indicator, irrespective of citations accrued to them.

In 2020 Scopus index published documents from 25,232 journals to track the scholarly literature worldwide along with the citations to them. Among these, management journals make up 1,427. These journals came from 55 different countries (https://www.scimagojr.com/journalrank.php).

Indian rating agencies are increasingly relying on Scopus indexed journals as one of the quality criterion. The current analysis presents the related details.

Objectives

The objectives of this analysis are to understand :

- The extent of Indian management literature indexed in Scopus,
- Indian journals included in Scopus for indexing, and
- Citations accrued to these contributions.
- The analysis also aims to understand the most cited journals and institutions.

Data and Methods

The analysis maps the data for two decades from 2001-2020. The data for the analysis were sourced from Scopus citation database and http://www.scimagoJr.com – an online source from Scopus publishers.Citation data and, to an extent, the indexed source documents, are dynamic and ever changing. Such data, for understanding the institutions, journals, and authors, figuring among the top of the citation heap, were collected in June 2021.

Background to Bibliographic Citations

The prevailing trend of managerialism in research and academics is characterized by a growing emphasis on performance, measurement, competition, and accountability. The goal of measuring scholarly productivity has given rise to quantitative performance metrics, including publication count, citations, journal impact factor, h-index, and the like. These quantitative metrics now dominate decision-making in academic institutions, faculty selection as also in research funding at different levels. In fact, in the recent times citations to publications are at the core of these measures. The practice of citations, as opined by historians of science, is a 20th century phenomenon (Nicolaisen, 2003).

Citation analysis is expected to provide some degree of objectivity for assessments of research impact. The argument is that an article (and also the journal in

which it is published, institutional affiliation of the author, etc.,) that is cited by many researchers has, in some way, made a significant scholarly contribution. There are, however, many criticisms to this approach (Joint Committee on Quantitative Assessment of Research, 2008).

The original purpose of citation indexing was 'a bibliographic system for science literature that can eliminate the uncritical citation of fraudulent, incomplete, or obsolete data by making it possible for the conscientious scholar to be aware of criticism of earlier paper' (Garfield, 1955). In a later publication, Garfield (1962) listed the following reasons for citing : 'Paying homage to pioneers; Giving credit to related works; Identifying methodology, equipment etc; Providing background reading; Correcting one's own work; Correcting the works of others; Criticizing previous work; Substantiating claim; Alerting to forthcoming work; Providing leads to poorly disseminated, uncited works; Authenticating data and classes of fact; Identifying original publication describing an eponymic concept or disclaiming work or ideas of others (negative claim); Disputing priority claims of others (negative homage)'. All these, however, count when the knowledge in the concerned discipline cumulate continuously with scholarly contributions, as it is found to be in pure sciences. Social science and humanities, however, have different features in their knowledge accumulation and growth (Hogeweg-DeHaart, 1983). Despite this citation criterion is applied in these disciplines also.

Motives to Cite

Amidst divergent views on the utility of the citation analysis, numerous studies have analysed the contributions in various subjects using this method to identify popular journals and authors (Moosa, 2016). Some of these give a glimpse of the growth of science as reflected in citations (Zhao & Li 2015). There have also been many studies which point to lacunae of the technique at the operational level (Adam, 2002). Some others give a panoramic view of these measures and methods as in Bornmann& Daniel (2008); some have questioned the veracity of the data used for citation studies (Adam, 2002). Wright's (2008) article '*Fawlty Towers of Knowledge*' highlights the secondary and tertiary citation habits in which he points to various errors in citations leading to the conclusion that a large proportion of all citations are erratic.

Over the past half-a-century citation studies have built an enormous body of literature with claims and counter claims. San Francisco Declaration (https://sfdora.org/) and Leiden Manifesto (http://www.leidenmanifesto.org/)

corrects some of the overambitious claims of the method. A report from the International Mathematical Union and the Institute of Mathematical Statistics (*Joint Committee on Quantitative Assessment of Research, 2008*) point to some of the basic flaws. Despite this citation as a proxy for scholarly quality holds in the contemporary academic imagination.

Data Analysis and Discussion

As has been mentioned earlier, the data for this analysis was obtained from Scopus database. Web of Science is an alternative citation index. Scopus, though relatively of recent origin, is more inclusive in its coverage. Scopus database broadly categorizes its contents into 27 broad categories, including sciences, engineering, social sciences and humanities. The category that includes all the management contributions is – Business, Management and Accounting. This head includes 10 sub-categories namely –

- Accounting
- Business and International Management
- Business, Management, and Accounting (miscellaneous)
- Industrial relations
- Management Informational Systems
- Management of Technology and Innovation
- Marketing
- Organizational Behavior and Human Resource Management
- Strategy and Management
- Tourism, Leisure, and Hospitality Management

Searching the Scopus database - SUBJAREA (BUSI) - will return documents that are classified under the subject category 'Business, Management and Accounting'. For the current analysis, output was further limited to the years 2001-2020, with India as the country of affiliation.

Growth and Extent of Indian Management Publications

Indian management scholarly literature represented in Scopus makes only a small proportion of the world output (Table-1). For a large part during the decade 2001-2010 it was just around 1 to 2 per cent of the total under the category. It has gradually increased during the 2010-2020 period. As we do not have a comprehensive secondary source listing the local output in business and management, we cannot estimate the proportion of the total Indian publication that comes to the international attention through Scopus.

Table-1 : Extent of Indian Management Publications in Scopus

Year	India	India %	World	World %
2001	547	1.30	42,170	100.00
2002	586	1.27	46,051	100.00
2003	678	1.41	48,126	100.00
2004	760	1.60	47,378	100.00
2005	914	1.52	60,252	100.00
2006	1,002	1.67	60,167	100.00
2007	1,093	1.78	61,573	100.00
2008	1,136	1.85	61,544	100.00
2009	1,262	2.10	60,014	100.00
2010	1,499	2.31	64,853	100.00
2011	1,958	2.93	66,766	100.00
2012	1,822	2.97	61,315	100.00
2013	2,233	3.56	62,776	100.00
2014	2,437	3.61	67,494	100.00
2015	2,764	3.86	71,646	100.00
2016	3,421	4.21	81,355	100.00
2017	3,792	4.71	80,440	100.00
2018	3,975	4.70	84,644	100.00
2019	12,706	12.71	1,00,513	100.00
2020	7,328	7.36	99,625	100.00

Scopus indexes several document types in its output such as Article, Book Chapter, Conference Paper, Review, Editorial, Book, Note, Short Survey, Letter, Erratum, Retracted, Business Article, and also those with Undefined document type. It may be seen in Table-2 that articles in journals (77.01%) make up more than three-fourths of the total. This is followed by book chapters (7.95%), conference papers (7.81%) and others. The remaining categories of publications contribute in all a little over 7 per cent of the total of Indian documents in Scopus for the last two decades.

Table-2 : Document Type-Wise Distribution of Indian Management Publications in Scopus (2001-2020)

Document Type	Total	%
Article	43,239	77.01
Book Chapter	4,463	7.95
Conference Paper	4,386	7.81
Review	1,908	3.40
Editorial	639	1.14
Book	569	1.01
Note	431	0.77
Short Survey	343	0.61
Letter	89	0.16
Erratum	48	0.09
Retracted	8	0.01
Business Article	4	0.01
Undefined	18	0.03

Table-3 presents year-wise growth of main document types. As we can see articles, when confined to the major document types and invariably citable documents, make up 82.11 per cent over the two decades, and has picked up during the 2001-2020 period. It is so with book chapters and also conference papers as well.

A more detailed subject-wise growth of management literature is presented in Table-4. It is good to note that under the overall 10 sub-categories of business

Table-3 : Year-Wise Growth of Major Types of Indian Management Publications

Year	Article	Book	Book Chapter	Conference Paper
2000	404	0	0	3
2001	527	0	0	4
2002	558	0	0	4
2003	645	35	0	7
2004	722	0	14	17
2005	821	4	32	29
2006	872	7	43	42
2007	922	7	43	90
2008	977	9	73	82
2009	1,092	12	71	89
2010	1,231	10	91	105
2011	1,364	10	75	391
2012	1,476	22	125	124
2013	1,646	49	397	454
2014	1,713	45	344	554
2015	2,038	62	621	327
2016	2,458	83	610	274
2017	3,148	81	696	304
2018	3,451	59	647	271
2019	11,211	51	409	663
2020	5,963	23	172	552
Total %	43,239 (82.11%)	569 (1.08%)	4,463 (8.48%)	4,386 (8.33%)

Table-4 : Sub-Category-Wise Distribution of Documents in Scopus

Years		Accounting		Business and International Management		Business, Management and Accounting (miscellaneous)		Industrial Relations		Management Information Systems		Management of Technology and Innovation		Marketing		Organizational Behavior and Human Resource Management		Strategy and Management		Tourism, Leisure and Hospitality Management	
		India	World	India	World	India	World	India	World	India	World	India	World	India	World	India	World	India	World	India	World
2001	9	2,050	267	7,982	272	10,581	4	1,217	18	1,318	16	11,156	11	6,821	16	2,952	83	10,461	4	1,269
2002	4	2,227	300	8,888	287	10,305	4	1,531	9	1,967	33	11,793	14	8,030	14	3,106	75	11,912	10	1,287
2003	3	2,384	312	9,253	319	14,024	11	1,516	19	2,283	38	11,686	26	7,174	28	3,286	115	10,647	6	1,252
2004	5	2,509	395	9,478	351	14,351	5	1,568	17	1,437	40	8,910	20	7,175	23	3,552	117	13,037	8	1,294
2005	20	2,600	400	11,544	432	19,654	9	1,661	35	2,291	54	10,626	35	8,389	29	4,074	169	15,402	7	2,130
2006	5	2,852	433	12,834	451	19,274	11	1,712	54	2,737	84	9,515	47	7,714	26	4,380	201	17,118	7	2,341
2007	9	2,919	481	13,754	426	19,312	16	1,737	46	2,890	85	10,140	61	8,132	39	4,589	245	17,921	23	2,215
2008	12	3,193	475	14,964	416	19,291	6	1,908	103	4,131	114	8,797	61	8,339	29	4,854	261	17,717	8	2,214
2009	15	3,832	496	15,613	426	17,732	11	2,558	122	5,196	149	10,300	74	8,351	43	5,736	333	16,031	25	2,471
2010	19	4,005	560	16,196	496	18,023	18	2,499	115	7,849	209	9,684	116	8,256	75	6,125	395	17,006	42	2,702
2011	17	5,209	636	17,112	505	18,003	24	2,636	154	4,855	506	12,888	126	7,309	92	6,325	485	17,931	27	3,094
2012	26	3,951	656	15,819	556	17,688	17	2,250	172	4,697	294	11,085	131	7,031	78	6,190	571	16,509	28	3,264

(Contd...)

2013	24	3,891	703	16,120	590	17,975	15	2,266	194	5,955	525	12,054	161	7,341	82	6,089	622	16,402	26	3,497
2014	24	4,133	619	16,469	630	18,031	20	2,198	342	7,428	559	12,760	208	7,333	124	6,207	594	17,810	34	3,692
2015	35	4,108	843	18,667	585	18,530	33	2,366	274	7,441	395	14,074	239	7,333	164	6,488	1099	20,685	35	3,896
2016	42	4,313	1166	19,915	701	21,152	45	2,456	542	6,998	556	15,184	276	8,870	251	6,976	1227	25,489	126	4,454
2017	64	4,662	1227	21,772	886	20,059	38	2,356	368	6,130	570	16,239	276	7,858	220	7,017	1327	25,050	81	5,302
2018	113	5,435	1109	21,468	896	19,837	31	2,217	429	6,950	699	16,533	345	9,142	239	7,436	1493	29,290	87	5,672
2019	134	5,736	1212	22,730	1266	18,364	30	1,913	387	7,054	8586	29,033	429	9,762	347	8,838	2070	31,013	168	6,606
2020	203	7,567	1328	21,312	1155	18,506	48	2,245	589	8,299	2813	20,768	570	10,959	383	8,819	2129	34,442	200	8,212
Total %	1.01	100.00	4.37	100.00	3.32	100.00	0.97	100.00	4.07	100.00	6.20	100.00	2.00	100.00	2.04	100.00	3.56	100.00	1.42	100.00		

and management there is a steady increase in the number of documents included. Their proportion, compared to the world total, is relatively less and range from 0.97 per cent for Industrial Relations to 6.20 per cent in Management of Technology and Innovation, over the two decades. Our contributions relating to Management of Technology and Innovation (6.20% of the total), Business and International Management (4.37%), as also Management Information Systems (4.07%) have found relative better acceptance in the international literature. It is not so in the more locally relevant aspects of management like Industrial Relations (0.97%), Marketing (2.0%), Organizational Behaviour (2.04%) related publications. However, we may not be able to discount the importance of such studies, even when not included in Scopus, as they are of immediate relevance to keep the management activities and businesses going locally.

Analysis of Citations

Citation index captures data on use or citation intensity of the documents included in the database. Citation is an essential indicator of perceived quality of the document. Higher the citation intensity to a document, higher is its usefulness. Table-5 provides a view of the citedness of Indian documents in Scopus as a whole. It is heartening to note that citedness of Indian documents in Scopus varies from 60 per cent – 70 per cent for different years. Though Indian contributions included in Scopus are limited, they are found to be put to use extensively in other studies through citations.

Citation Intensity

More detailed analysis of the extent of citation is presented in Table-6. We can see that among the Scopus indexed articles those with 10 or more citations makes up 17.33 per cent of the total. Proportion of the articles that have not been cited even once (42.38%) is also substantial and is a cause for concern. It is ironical that despite being uncited these articles are treated as quality output by the rating agencies. The trend indicates that some articles are more often cited than the others. The same trend holds good for books, book chapters and conference papers included in Scopus (Table-6).

The analysis was extended to know the year-wise distribution of mean citations for four main document types. It could be noticed that journal articles have registered consistently high mean citation intensity, despite they making a high proportion in the total. Book chapters are cited the least among the four types analysed here. Books and Book chapters have registered lesser citations specially in the recent years.

Table-5 : Citedness among Indian Management Documents in Scopus

Year	Cited		Uncited	
	India	%	India	%
2001	308	56.31	239	43.69
2002	331	56.48	255	43.52
2003	407	60.03	271	39.97
2004	417	54.87	343	45.13
2005	525	57.44	389	42.56
2006	606	60.48	396	39.52
2007	658	60.20	435	39.80
2008	719	63.29	417	36.71
2009	798	63.23	464	36.77
2010	1,003	66.91	496	33.09
2011	1,339	68.39	619	31.61
2012	1,226	67.29	596	32.71
2013	1,520	68.07	713	31.93
2014	1,721	70.62	716	29.38
2015	2,066	74.75	698	25.25
2016	2,478	72.43	943	27.57
2017	2,541	67.01	1,251	32.99
2018	2667	67.09	1,308	32.91
2019	4290	33.76	8,416	66.24
2020	1700	23.20	5,628	76.80

Most Cited Indian Documents

As we see in citation distribution the citations to documents are not evenly distributed. While some documents are not cited at all, some others are cited most often, which are referred to as citation classics. The top 10 Indian management documents pertaining to the last two decades cited most often are listed below. Incidentally all these are also cited more than 500 times, and the one on the top of the list had, in June 2021, over 2,000 citations. It has to be noted that some of these documents would have co-authors as those with Indian affiliation when it was published.

Table-6 : Extent of Citations to Different Document Types among Indian Management Publications

Citations Document Type	Uncited	1	2	3	4	5	6	7	8	9	10>
Article	18,324 (42.38)	5,683 (13.14)	3,252 (7.52)	2,164 (5.00)	1,682 (3.89)	1,308 (3.02)	1,029 (2.38)	917 (2.12)	716 (1.66)	672 (1.55)	7,493 17.33)
Book	177 (32.90)	102 (18.96)	70 (13.01)	32 (5.95)	35 (6.51)	21 (3.90)	17 (3.16)	8 (1.49)	8 (1.49	12 (2.23	56 (10.41)
Book Chapter	2,801 (62.33)	804 (17.89)	329 (7.32)	177 (3.94)	104 (2.31)	66 (1.47)	56 (1.25)	26 (0.58)	23 (0.51)	19 (0.42)	89 (1.98)
Conference Paper	1,966 (44.82)	743 (16.94)	458 (10.44)	272 (6.20)	213 (4.86)	119 (2.71)	102 (2.33)	85 (1.94)	66 (1.50)	36 (0.82)	326 (7.43)

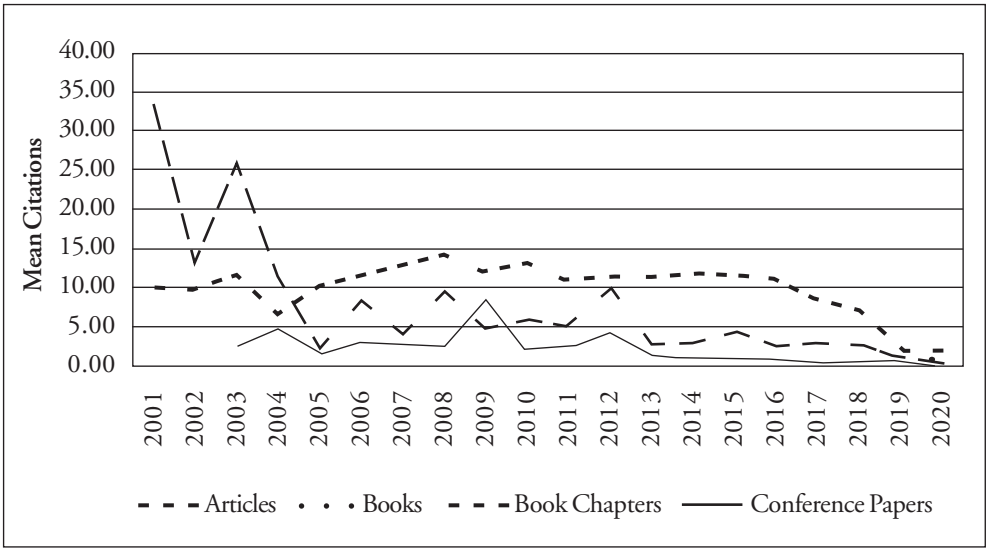
Most cited articles	**Citations**
• **Srivastava, S.K (2007)** Green supply-chain management : A state-of-the-art literature review, International. *Journal of Management Reviews*	2,126
• Burnham, T.A., Frels, J.K., **Mahajan, V (2003)** Consumer switching costs : A typology, antecedents, and consequences. *Journal of the Academy of Marketing Science*	906
• D'Arcy, J., Hovav, A., Galletta, D (2009) User awareness of security countermeasures and its impact on information systems misuse : A deterrence approach. *Information Systems Research*	691
• **Ravi, K., Ravi, V (2015)** A survey on opinion mining and sentiment analysis : Tasks, approaches and applications. *Knowledge-Based Systems*	638
• Van Der Aalst W., et al (2012) Process mining manifesto. *Lecture Notes in Business Information Processing*	624
• **Govindan, K et al (2015)** Multi criteria decision-making approaches for green supplier evaluation and selection : A literature review. *Journal of Cleaner Production*	570

- **Dreze, J., Sen, A. (2013)** An uncertain glory : India and its contradictions 569
- **Khanna, T., Palepu, K.G., Sinha, J.(2005)** Strategies that fit emerging markets. *Harvard Business Review* 555
- **Raci, V., Shankar, R (2005)** Analysis of interactions among the barriers of reverse logistics. *Technological Forecasting and Social Change* 547
- **Arshinder, Kanda, A., Deshmukh, S.G (2008)** Supply chain coordination : Perspectives, empirical studies and research directions. *International Journal of Production Economics* 541

Table-7 : Document-Type-Wise Mean Citations

Year	Articles	Books	Book Chapters	Conference Papers
2001	10.04	0.0	0.0	33.50
2002	9.90	0.0	0.0	13.25
2003	11.83	11.00	2.65	26.14
2004	6.81	0.0	4.86	11.29
2005	10.39	13.75	1.66	2.38
2006	11.57	13.43	3.16	8.55
2007	12.64	11.14	2.49	4.02
2008	14.32	23.78	2.79	9.76
2009	12.25	29.08	8.61	4.66
2010	13.09	9.20	2.05	6.06
2011	11.00	6.20	2.65	5.18
2012	11.59	2.73	4.32	10.02
2013	11.19	19.24	1.55	2.65
2014	11.70	4.51	1.02	2.99
2015	11.83	4.10	.96	4.40
2016	11.07	3.07	1.01	2.57
2017	8.47	1.86	.74	2.83
2018	7.01	1.56	.67	2.54
2019	2.06	1.16	.80	1.21
2020	1.86	.22	.27	.44
N	43,239	569	4,463	4,386

Document-Type-Wise Mean Citations



Indian Journals included in Scopus

In all 37 Indian journals figure in the Scopus list under this category – Business, Management and Accounting - during 2000-2020 period. Of these, 9 are trade journals and the remaining 28 academic ones. Out of these, eight journals are currently discontinued by Scopus. National Information Centre on Management (NICMAN), set up at the IIM, Ahmedabad, in its directory of Indian management journals lists a total of 152 journal titles from various management institutions in the country (https://library.iima.ac.in/public/nicman/indian_management_journals.pdf).Thus, the local journals selected for indexing in Scopus currently is a mere 18.42 per cent of the total.

Journals that have been included in all the years from the year 2001 are listed below :

	SJR	H index
Global Business Review	0.419	25
Global Journal of Flexible Systems Management	0.819	31
Journal of Human Values	0.262	13
Vikalpa	0.241	23

Other academic journals in the list are as follows:

	SJR	H index
Asian Journal of Management Cases	0.142	7
Finance India	0.162	1
Indian Journal of Economics and Business	0.406	5
Indian Journal of Marketing	0.237	10
International Journal of Hospitality and Tourism Systems	0.123	2
International Journal of Mathematical, Engineering and Management Sciences	0.228	10
International Journal of Rural Management	0.270	10
International Journal of Systems Assurance Engineering and Management	0.300	24
Journal of Entrepreneurship	0.718	18
Journal of South Asian Development	0.244	13
OPSEARCH	0.353	20
Prabandhan: Indian Journal of Management	0.223	7
Purushartha	0.108	3
SCMS Journal of Indian Management	0.120	2
BTRA Scan	0.112	3
Journal of the Textile Association	0.129	10

Three journals dealing with India, as the title would suggest, are listed in Scopus database as imprint UK, as they are published by Emerald Group. These are Journal of Indian Business Research; Indian Journal of Corporate Governance; and Indian Growth and Development Review.

Global Journal of Flexible Systems Management with a high h index value (31) and also a relatively high SJR (0.819) stand out among the lot. H index value of 31 indicate that the journal has 31 articles each of which having 31 or more citations in Scopus database. Scimago Journal Rank (SJR) refers to the popularity of the journal calculated based on citations received by the articles in the respective journal and those given out by the articles to other journals (https://www.scimagojr.com/files/SJR2.pdf). H index valve and SJR for other Indian journals indexed in Scopus is listed along with their respective titles above. Most of them figure at the lower end despite their inclusion in the index for many years.

Table-8 presents citations data for Indian publications in select top journals, along with number of publications included, total citations accrued to them and citations per document.

Journal of Cleaner Production, International Journal of Production Research, Journal of Manufacturing Processes, Benchmarking, Global Journal of Flexible Systems Management, Journal of Entrepreneurship, Global Business Review, International Journal of Systems Assurance Engineering and Management, Vikalpa, OPSEARCH, and others, are much sought after journals with higher citations per article. Journals in the top of this list also point to the citation preference to those dealing with research on manufacturing and production relating research.

Table-8 : Citation Data for Indian Publications in Select Top Journals in Scopus

Source Title	Total Citations	Number of Documents	Citation per Document
Journal of Cleaner Production	37,845	1,111	34.06
International Journal of Production Research	14,960	458	32.66
Journal of Manufacturing Processes	7,505	374	20.07
Benchmarking	6,584	423	15.57
Global Journal of Flexible Systems Management	3,977	290	13.71
Journal of Entrepreneurship	277	31	8.94
Global Business Review	4,404	643	6.85
International Journal of Systems Assurance Engineering and Management	3,533	564	6.26

Vikalpa	3,091	547	5.65
OPSEARCH	1,823	347	5.25
Indian Journal of Economics and Business	165	39	4.23
Journal of South Asian Development	214	56	3.82
International Journal of Rural Management	386	103	3.75
Journal of Human Values	506	165	3.07
International Journal of Mathematical, Engineering and Management Sciences	465	195	2.38
Indian Journal of Marketing	767	346	2.22
Prabandhan: Indian Journal of Management	486	251	1.94
Colourage	2,613	1,610	1.62
Management and Labour Studies	567	413	1.37
International Journal of Applied Business and Economic Research	938	735	1.28
Indian Journal of Sericulture	533	516	1.03
Journal of the Textile Association	518	557	0.93
Asian Textile Journal	734	857	0.86
International Journal on Emerging Technologies	417	571	0.73
International Journal of Recent Technology and Engineering	4,444	6,279	0.71
Purushartha	94	141	0.67
International Journal of Hospitality and Tourism Systems	19	32	0.59
Asian Journal of Management Cases	23	54	0.43
International Journal of Economic Research	163	425	0.38
International Journal of Scientific and Technology Research	905	2,905	0.31
Textile Magazine	112	385	0.29
Indian Silk	320	1,203	0.27
Emerald Emerging Markets Case Studies	101	380	0.27
SCMS Journal of Indian Management	20	101	0.20
Finance India	16	143	0.11

The analysis also shows that a total of 1,298 different journals, most of which not with Indian imprint, have published articles by authors with Indian affiliation. Top 20 of them with higher citations are listed below. Indian management scholars seem to publish widely in foreign journals.

Citation Intensity of Open Access Documents

The analysis also examined whether the documents available online as open access makes a difference for the citation intensity. Though there are several types of open access to journals like Gold,

Table-9 : Select Top List of Journals with Indian Publications

Source Title	Number of Articles
Journal of Cleaner Production	30,872
International Journal of Production Research	14,154
International Journal of Production Economics	8,616
Journal of Manufacturing Processes	6,331
Benchmarking	5,763
Knowledge-Based Systems	5,412
Production Planning and Control	4,872
International Journal of Recent Technology and Engineering	4,415
Journal of Retailing and Consumer Services	4,410
Global Business Review	4,322
Global Journal of Flexible Systems Management	3,377
Journal of Business Research	3,322
International Journal of Systems Assurance Engineering and Management	3,272
International Journal of Productivity and Performance Management	3,159
Journal of Manufacturing Technology Management	3,102
International Journal of Quality and Reliability Management	2,936
Vikalpa	2,912
International Journal of Bank Marketing	2,605
International Journal of Services and Operations Management	2,592
Colourage	2,477

Green, Bronze, and Platinum/Diamond, from the readers' perspective all of them make available the text or the abstract of the document online (https://en.wikipedia.org/wiki/Open_access).

It was found that among the Indian management journal articles indexed in Scopus over the two decades considered for the analysis, 6,019 are categorized as open access of varying types. Cross tabulation of the citation data on the open or the conventional access show that the mean citation intensity is 2.86 per article for the open access, compared to 7.81 for those which are not open and accessible on the internet (Table-10). As of now the ready availability of the articles through the internet does not seem to help augment the citation intensity.

Table-10 : Citation Intensity of Open and Conventional Access Journals

Journal Access Mode	N	Mean Citations
Open access	6,019	2.86
Conventional access	37,220	7.81
Total	43,239	7.12

International Collaboration

Indian research on management indexed in Scopus also point to collaboration with scholars from as many as 135 different countries. Important among them are listed in Table-11.

Table-11 : Indian Documents with International Collaboration

Collaborating Countries	Number of Articles
United States	2,550
United Kingdom	1,075
Australia	547
Canada	408
China	345
France	337
Germany	326
Malaysia	309
United Arab Emirates	259
Saudi Arabia	213
Singapore	208
Netherlands	195
South Korea	193
Japan	191
Italy	174
Hong Kong	161
South Africa	151
Denmark	129
Switzerland	127
Finland	119
Taiwan	119
Spain	110
New Zealand	100

Institutional Affiliation

As many as 160 different Institutions figure in the list of author affiliation of the publications figuring in Scopus. Important among them and in the top ranks are presented below.

Table-12 : Institution-wise Distribution of Management Contributions Indexed in Scopus

Institutions	Number of Documents
Indian Institute of Technology, Delhi	1,421
University of Delhi	996
Indian Institute of Technology, Kharagpur	950
Indian Institute of Technology, Roorkee	853
Amity University, Noida	820
Anna University	763
Indian Institute of Management, (Ahmedabad)	721
K.L.Deemed to be University	701
Vellore Institute of Technology	689
Indian Institute of Technology, Bombay	632
Indian Institute of Management, (Bangalore)	617
Indian Institute of Technology, Madras	581
Indian Institute of Management, (Calcutta)	549
P.S.G College of Technology	543
National Institute of Industrial Engineering	506
Management Development Institute, Gurgaon	493
Indian Institute of Technology, Kanpur	479
Jadavpur University	476
Birla Institute of Technology and Science, Pilani	469
Symbiosis International Deemed University	457
Indian Institute of Management, (Lucknow)	429

Lovely Professional University	423
Jawaharlal Nehru University	417
SRM Institute of Science and Technology	408
National Institute of Technology, Tiruchirappalli	404
Institute of Management Technology, Ghaziabad	401
Bharath Institute of Higher Education and Research	397
I.B.S. Hyderabad	389
Institute of Chemical Technology	385
Indian Institute of Management, Indore	373
Kumaraguru College of Technology	340
Aligarh Muslim University	340
Indian Institute of Management, (Kozhikode)	335
Central Sericultural Research and Training Institute India	326
Sathyabama Institute of Science and Technology	324
Indian Institute of Science	315

The above analysis gives a panoramic view of the Indian business, management and accounting documents in Scopus database over the last two decades. The analysis points to the need for inclusion of more Indian management journals and also expanding the share of Indian studies in Scopus. As of now Indian contributions in Scopus is only a small proportion of the total.

The analysis indicates the following:

- Indian management literature represented in Scopus is miniscule compared to the total under the category;
- Even among these the distribution is skewed towards research relating to manufacturing and production aspect of management;
- Journals with Indian imprint indexed in Scopus under the management category are very few compared to the total number published in the country;
- Journals from some of the better known management institutions in the country are also not indexedin Scopus;

- Management scholars have shown a tendency to collaborate internationally in an extensive manner;
- Though the cited documents make a substantial proportion compared to the uncited ones, the extent of citations are not high for most of them;
- Citation intensity of documents in open access journals compared with the conventional access do not seem to hold any advantage;
- Institutional affiliation of authors indicates that Indian management researchers prefer to publish in journals that bear foreign imprint compared to the ones with Indian imprint.

Conclusion

Citation Index as a retrieval source is a labour intensive and expensive enterprise. Generally these indices confine to a small proportion of scholarly journals. Because of the interdisciplinary nature of the index and amenability of citations to quantitative measures these databases are popular and perceived to be the indicators of quality contributions.

The present analysis presents a panoramic view of the Indian management literature as viewed from Scopus database perspective. The analysis points to the need for greater inclusion of management journals of Indian imprint in the database. As of now the relatively better intertwined subcategory of Indian management scholarship internationally are in the areas of Management of Technology and Innovation, Management Information Systems, and International Management.

References

Adam, D. (2002) The counting house. *Nature*, 415(6873), 726-729.

Bornmann, L. & Daniel, H.D. (2008) What do citation counts measure? A review of studies on citing behaviour, *Journal of Documentation*, 64(1), 45-80.

Garfield, E. (1955) Citation indexes for science : A new dimension in documentation through association of Ideas, *Science*, 122(3159), 108-111.

Garfield, E. (1964) *Can citation indexing be automated?* (in Stevens & Laurence (Eds.) *Statistical Association Methods for Mechanized Documentation, Symposium Proceedings, Washington 1964,* National Bureau of Standards Miscellaneous Publication 269, December 15, 1965, 189-192, Retrieved from http://www.garfield.library.upenn.edu/essays/V1p084y1962-73.pdf

Hogeweg-De Haart, H.P. (1983). Characteristics of social science information : A selective review of the literature, *Social Science Information Studies*, 3(3), 147-164.

Joint Committee on Quantitative Assessment of Research : Citation Statistics – A report (2008) by the International Mathematical Union (IMU) in cooperation with the International Council of Industrial and Applied Mathematics (ICIAM) and the Institute of Mathematical Statistics (IMS) (Robert Adler, John Ewing (Chair), Peter Taylor). Retrived from http://iciam.org/sites/default/files/news/CitationStatistics-FINAL_0.PDF

Leiden Manifesto. Retrieved from http://www.leidenmanifesto.org/

Moosa, Imad A. (2016) Citations, journal ranking and multiple authorships : Evidence based on the top 300 papers in economics, *Applied Economics Letters*, 24(3), 175-181.

Nicolaisen, J. (2003) The social act of citing : Towards new horizons in citation theory, *ASIS&T,* 40(1), 12-20.

The Declaration on Research Assessment San Francisco, Retrieved from https://sfdora.org

Wright, M. & Armstrong, J.S. (2008) The ombudsman : Verification of citations : fawlty towers of knowledge?, *Interfaces*, 38(2), 125-139.

Zhao, Star X. & Jiang Li. (2015) Citation peaks in modern science 1900-2010, *Current Science*, 109(9), 1523-1525.

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Perspective of Talent Management in Central Public Sector Enterprises

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Talent management (TM) offers value to organizations in varied forms including to expense reduction, quality improvement, process redesign and employee retention. Talent is a leading factor in a company's competitive advantage. Since several years Central Public Sector Enterprises (CPSEs) have been looked down upon for not focusing much on talent perspectives. There is a sea-change witnessed in CPSEs in India as there has been an increasing focus on encouraging talent based practices. Identifying, enabling and nurturing the right talent for the right job is not more an essentiality but a survival practice for organizations. It is in this context that the paper attempts to discuss the employee perspective on the existing talent management initiatives. This paper also explains the role of TM, practices and problems concerning TM in CPSEs and the initiatives that need to be introduced for an efficacious TM in the CPSEs.

Keywords : Talent management, Employee Engagement, Central Public Sector Enterprises, India.

Introduction

Organizations which aspire to attract the best of talents and retain employees across all levels must have an integrated approach to talent management. Many Indian organizations have realized that it is the quality of people which they employ, retain and develop will ensure their business profitability and provide them a competitive advantage. Talent management is concerned with delivering business success by understanding what an organization actually means by talent and how it can achieve the long-term organizational goals. It aims at ensuring that the organizations value natural talents and understand the obstructions to an effective performance. Talent management solution integrates the needs of the management, executives and employees into one system and unifies information across all the major HR processes like performance

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management, recruitment and selection, learning and development, succession planning and career development. The objective of the paper is to discuss the employee perspective on the existing talent management initiatives.

Talent Management – The Concept

Talent management is the full scope of HR processes to attract, develop, motivate and retain high-performing employees. This definition has three components :

1. The Full Scope of HR Processes

Talent management is about a set of HR processes that integrate with each other. This means that talent management activities are larger than the sum of the individual parts. This also means that a talent management strategy is required to capitalize on its full potential.

2. Attract, Develop, Motivate and Retain

This is not a comprehensive list. Talent management touches on all key HR areas, from hiring to employee onboarding and from performance management to retention.

3. High-Performing Employees

The purpose of talent management is to enhance performance. It aims to motivate, engage, and retain employees to make them perform better. This is why the importance of talent management is so significant. When it is done right, companies can build a sustainable competitive advantage and outperform their competition through an integrated system of talent management practices that are hard to copy and/or imitate.

In other words, talent management is a process aimed at driving performance through integrated people management practices. As such, it is one of the key functions of human resources.

Role of Talent Management

TM is the science of using strategic human resource planning to improve business value and to make it possible for companies and organizations to reach their goals. Everything done to recruit, retain, develop, reward and make people perform forms a part of TM as well as strategic workforce planning. A talent-management strategy needs to link to a business strategy to make sense. TM involves individual and organizational development in response to a changing and complex operating environment. It is not just limited to attracting the best people from the industry but it is a continuous process that involves sourcing, hiring, developing, retaining and promoting them while meeting the organization's requirements simultaneously.

TM implies recognizing a person's inherent skills, traits, personality and offering him a matching job. Every person has a unique talent that suits a particular job profile and any other position will cause discomfort. Talent-management processes include workforce planning, talent gap analysis, recruiting, staffing, education and development, retention, talent reviews, succession planning, and evaluation. Simply put, TM ensures that the right people, with the right skills, are in the right place, and are engaged and focused on the right activities to achieve targeted business results. It is the complete set of processes an organization employs to identify, acquire, deploy, develop and manage the people it needs to successfully execute its business strategy.

TM is one of the primary management tools for the 21st century human asset management because the significant resource for firms competing in this century is no longer land, capital and other tangible assets but the human capital necessary to adapt organizations to global competition and maximize the benefits associated with the current technological boom (Tiwari & Shrivastava, 2013). TM has become an imperative need in the face of today's business challenges. The challenge of doing more with less in today's business environment has placed increasing demands on the workforce to be multi-skilled, flexible and independent.

As technology continues to advance breaking down traditional barriers, new production methods introduced, increasingly demanding customers, shrinking product life cycles, the criticality of an organization's talent becomes a top priority for leaders. In order to effectively support business strategies leaders, and successfully champion explicit strategies to ensure access to sufficient talent flow and actively engage the organization's talent to achieve the business objectives (Muduli, n.d.). In countries like India where the demand for quality hires is rising day after day, it is a tough call for a HR professional to adopt suitable strategies for TM.

According to (Cannon & McGee 2011), TM is the process by which an organization identifies, manages and develops its people now and for the future. It is concerned with :

- Developing a strategy to determine what the organization needs to meet the current and future demands of the business plan
- Establishing processes to measure competence – required and available
- Creating a range of developmental tools and processes to provide tailored approaches depending on the individual needs of employees
- Identifying ways to obtain and retain those who are critical to success

- Establishing suitable approaches to deal with those who no longer fit organization requirements measuring the impact these strategies have so that policy can be continually updated and refined to deliver high performance, now and in years to come.

Managing talent is about ensuring that the organization has an external talent pool available from which to draw qualified candidates, while at the same time continuing to build on the existing talent that exists within the organization. In managing talent, an organization must build an attractive employer brand so that the perception of the organization to both potential and existing employees is one of a progressive employer that is focused on achieving organizational priorities and excellence in public service, and recognizes the value of employees to organizational efforts (Public Service Secretariat, 2008). TM is about more than just attracting and retaining talent. It is also about researching, developing, and implementing a series of human resource (HR) initiatives and looking at how these initiatives fit together to manage the talent available to a department.

TM has become an imperative in the face of today's business challenges. Companies are increasingly realizing that successful TM is the key to high performance. By assessing available talent, placing the right people in their best roles and finally retaining them that organizations can survive and thrive in today's increasingly competitive markets.

TM in CPSEs : Process and Problems

The CPSEs over the last many decades have played a significant role in the national development. The government owns or controls interests in key sectors including infrastructure, oil, gas, mining, manufacturing and banking. Over the decades the Government of India (GoI) has taken a number of steps to improve the performance of CPSEs including through better corporate governance. Post-liberalization, there has been an increased pressure on CPSEs to improve their competitiveness and the listing of CPSEs on the stock exchanges. However, a closer look at the data suggests that CPSEs are missing the bus by a mile, and need to catch up with their peers to attract and retain talent.

Public sector organizations are confronted with the intensifying competition for talent and suffer from a chronic shortage of talented people. There is little empirical research on the specific TM issues in the public sector. The empirical data are collected in two substitutes on TM in the public sector. The

data show that TM is highly contextual and is evident that both the organizational internal and external context affects the intended TM strategy, including the actors involved in TM and their interrelated logs.

Studies on TM in the public sector have been limited to internal surveys and does not throw much light. Pollitt and Geert (2004) studied how the top civil servants and 'highfliers' of seven European countries were trained. Most studies have focused on single-country cases. Studies in Indian context are also limi-ted to only studying HR practices and there are hardly any researches on the existing TM practices and the scope for working on it. Mathe, et al. (2016) highlights that public sector enterprise also face competition and lack of resources and technology. In order to compete with private sector effective talent pool in the form of employees is vital for PSEs. Rana, Goel, and Rastogi, (2013) studied BHEL's well-designed TM strategy that are focused on competencies, knowledge, learning engineering and technological advancements.

The investigation was carried out using a case study analysis. The work concluded that TM practices if effectively managed results in the long-term satisfaction amongst employees. Thus, an attempt is made to discuss the scope of TM practices in the Indian context using secondary data. Currently, the Indian CPSEs are in need to re-look at the TM systems deployed. A total of 53,448 employees retired from select CPSEs in 2015 and 2016.

Amongst other factors, lack of expenditure on R&D (as a % of sales) should be examined as one of the major contributors towards the exodus. The listed

Table-1 : Workforce Size and Attrition in Leading Indian CPSEs

	Number of Employees (Excluding Casual Labour)			Attrition	Attrition
Central Public Enterprises	**2015-16**	**2014-15**	**2013-14**	**2015-16**	**2014-15**
Bharat Sanchar Nigam Ltd.	211,086.00	225,512.00	238,277.00	12,765.00	14,426.00
Steel Authority of India Ltd.	88,655.00	93,352.00	97,897.00	4,545.00	4,697.00
Food Corporation of India	68,959.00	73,961.00	74,021.00	60.00	5,002.00
Eastern Coalfields Ltd.	66,238.00	68,681.00	71,826.00	3,145.00	2,443.00
South Eastern Coalfields Ltd.	64,505.00	67,800.00	70,910.00	3,110.00	3,295.00

Source : Department of Public Enterprises Survey 2015-16.

five CPSEs which are top 5 employers have spent a meager amount on R&D in respective organizations. For example, BSNL spent 0.28 per cent (of sales) on R&D in 2014-15 and 2015-16. Similarly SAIL incurred an expenditure of 0.71 per cent in 2015-16. Hence, the CPSEs are not only giving away an opportunity to the competition since the competition provides for enhanced capital for R&D which in turns delivers improved products at a lesser cost as production systems and processes are improved with investments which are critical, as CPSEs also are driving away best talents to the private industry.

CPSEs today employ JIT (Just-in-Time) tools to manage talent which are reactive to an environmental situation. The example of Coal India Limited (CIL) is most apt. As the government is set to auction coal blocks for commercial production to private companies, CIL has proposed pay scale revision for its 17,000 odd executives right from the junior level up to the chairman to be doubled considering the fact CIL employs the best of the talent in the field in the country.

The above strategies of investing less in R&D, being reactive to market conditions and the situation designing the human capital investments are not helping the cause of TM. There are several CPSEs which have shown a sequential decline in net sales/revenue from the levels of 2014-15 to that of 2015-16. (HPCL, IOC, SAIL, GAIL etc). Managing talent at the time when major industry verticals are being opened up for private participation is critical. The international dimensions of TM in the counterparts of CPSEs are detailed in Table-2.

Reinvigorating TM in CPSEs

It is thus clear that TM provide the key not only to turn around the CPSEs, but also is crucial for a leg up in their performance. The following TM components need a greater infusion in the strategic management of the CPSEs.

- **Employee Performance Evaluation Process** : CPSEs are at different levels of maturity in regard to their human resources evaluation process in terms of competence, availability of specialized people and leadership pipeline. While the government has taken a number of steps to improve the level of governance in the CPSEs, there have been far fewer initiatives to improve the system of human resources development. Except for introduction of incentives in the form of Performance Related Pay (PRP), mostly it is left to individual CPSEs to architect their human resources within the overall framework of the guidelines issued by the Department of Public Enterprises.

Table-2 : TM in Public Enterprises : An Asian Scenario

	Singapore	Malaysia	Thailand	India
Talent Recruitment	• Open Recruitments (fresh-graduates and mid-career entrants) • Pre-service bonded scholarships • Green harvesting • Scouting/ head-hunting	• Open Recruitments (fresh-graduates and mid-career entrants) • Pre-service bonded scholarships • Scouting/ head-hunting • Recruitments for administrative and diplomatic service	• Open Recruitments (fresh-graduates) • Pre-service bonded scholarships • Public sector innovation scholarship • Public Service Executive Development Program	• Open recruitments (fresh-graduates and mid-career entrants) • Contractual hiring on special assignments
Talent Development	• Allocated training hours • Roadmaps for special schemes i.e. Management Associates Scheme and Administrative Service Scheme (AS) • High potential scheme	• Allocated training hours • Administrative and Diplomatic Scheme (PTD) • High performing officer scheme	• Allocated training hours • High Potential Performance System (HiPPS) scheme • New wave leadership development	• Allocated training hours • Career planning • Assessment and Development Centre
Talent Retention	• Competitiveness pegged to market pay structure • Performance-based bonus payouts • Performance-based promotions • High pay structure for administrative officers	• Base pay coupled with types of allowances • Performance-based promotions • Opportunities for post-graduate studies • Fixed pay increment structure	• Fast Stream Track • Performance-based system • Higher pay (about 1% higher for High Potential officers)· • Perks in health care and pension schemes	• Performance-based system • Higher pay with competitive perks

Source : Comparison of India based on work of Poocharoen, O. and Lee, C. (2013), TM in the Public Sector a Comparative Study of Singapore, Malaysia and Thailand, Public Management Review Vol. X No. X.

The concept of doing away with Bell Curve provides for a continuous feedback system which is adopted by several companies in the private sector to incentivise employees and supervisors with open communication structures, instant feedback and corrective actions deployment, alignment to departmental goals leading to alignment to organization goals and business objectives.

- **Training Content :** Training content to focus on industry specific needs mainly focusing on vertical strength, deep domain knowledge, automation, cognitive thinking, business approach, understanding and interpretation of financials, on the job shadowing with a buddy, assessments and accreditations.

- **Training Decentralization :** Decentralized training at functional level and each functional head expected to devise their own training plan to develop critical skills and talent for their functions with a yearly budget encompassing internal and external training programs (Management Development Program at academic institutions of repute, etc.)

- **Functional Talent Pool Readiness** : Emphasis on development of talent pool in the core competence functional areas be it petroleum, mineral excavation, power generation, credit, forex and treasury; Involvement of functional general managers in design and conduct of the programs to be the hallmark of this initiative resulting into availability of vast pool of train the trainers who would keep providing orientation to new batches. This would in a way reduce panic hiring and arresting of large expenditures which are paid out to incentivize talent to stay. This process can enable CPSEs to protect their own interests.

- **Encourage Research and Projects :** Collaboration with staff colleges in India and other leading management institutions to provide help in research projects and harness human capital by providing intellectual engagement in enhancing organization value.

- **HR Leaders Training Programs :** Existing HR officers to be groomed through a long duration program at leading management schools to develop their orientation from a traditional mindset to developmental agenda in the digital age.

- **Adopting to Digital Labor Platforms :** CPSEs should look at a new wave of digital tools which can help companies to focus not only on hiring but also on managing, retaining, and developing employees. Digital labor platforms can pull these tools into an integrated whole as companies

widen their labor pools, refine their recruiting and screening methods, and deploy their employees more effectively. Such tools, and the platforms that include them, can put the right person in the right job, identify gaps in skills, help employees as they gain new capabilities, chart career paths, and nurture the development of the next generation of leaders.

- In short, digital labor platforms occupy a place at the frontier of big data analytics and IT-enabled performance improvement. Companies can capture substantial value by applying digital innovations to some of the most critical organizational challenges: matching the supply of and demand for labor, boosting productivity, and getting the most out of people. McKinsey Global Institute research suggests that businesses deploying digital labor platforms to their full potential could increase output by up to 9 per cent, reduce employee-related costs by up to 7 per cent, and add an average of 275 basis points to profit margins.

- **Increasing Employee Engagement :** Predictive analytics can identify employees likely to depart, flagging the need for mentoring, new jobs, or advancement to improve their satisfaction and engagement and thus decreasing employee turnover and raising productivity. In the USA, Bank of America, has made its employees more engaged by using humanyze' socio-metric badges (ID cards with embedded sensors that monitor interpersonal interactions) to gauge and improve the cohesion of call-center teams whose turnover dropped sharply as a result.

Wells Fargo has developed a predictive model to select the most qualified candidates for positions as tellers and personal bankers. Working with Kiran Analytics, the company identified the qualities that characterize engaged, high-performing employees in client-facing positions and then screened for those attributes in fresh candidates during recruitment. It was also observed that by the end of the program's first year, the retention of tellers and personal bankers rose by 15 and 12 per cent, respectively. CPSEs should take these models and approaches to deploy innovative and creative methods.

Methodology

The paper involves primary data collected using a questionnaire for CPSE employees. A tested questionnaire was preferred to be used *http://hdl.handle.net/10603/33924* by Senthilkumar. R (2015) which was earlier used for studying talent management practices and its impact on organizational productivity confined to the IT sector in Bengaluru.

The Cronbachs Alpha score is .977 and reflects that the questionnaire has a very high reliability.

Reliability of the Questionnaire

Table-3 : Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.977	.977	59

The variables studied are Commitment to Values (CV), Customer Focus (CF), Salary and Benefit (SSB), Developmental Plan for Staff (DS), Innovation (I), Managing Performance (MP), Quality Commitment (QC), Results Orientation (RO), Stimulating Open Climate (SO), Team Work (TW) and Benefits and Policies (BP). The employee perspective on the existing talent management with the above mentioned variables is as reflected.

The accompanying Table reflects that female employees feel innovation matters most apart from result-orientation in ensuing employee engagement while male employees feel that is managing performance and stimulating open climate.

Young employees carry a varied perspective where they feel customer focus is most important while innovation is also vital for engagement while very senior aged employees are stimulating open climate and team work and quality commitment. It is also observed that the seniors and youngsters have similar preference to customer focus as vital for engagement.

Table-4 : Talent Management Practices Perspective – Gender-wise

Variables Studied	Male	Female
Customer Focus	80.54	19.46
Salary And Benefit	80.65	19.35
Developmental Plan for Staff	80.26	19.74
Innovation	79.74	20.26
Managing Performance	81.42	18.58
Quality Commitment	80.51	19.48
Results Orientation	80.24	19.76
Stimulating Open Climate	80.84	19.16
Team Work	80.74	19.26

Table-5 : Talent Management Practices Perspective-Age-Wise

Variables Studied	Less than 30 Years	31-40 Years	41-50 Years	More than 50 Years
Customer Focus	26.08	25.41	24.86	23.65
Salary and Benefit	24.62	27.07	27.17	21.14
Developmental Plan for Staff	24.4	25.48	28.23	21.89
Innovation	25.3	25.7	27.89	21.12
Managing Performance	24.41	25.88	27.84	21.86
Quality Commitment	24.75	25.76	29.47	20.02
Results Orientation	24.44	26.05	28.4	21.11
Stimulating Open Climate	24.57	25.48	28.02	21.93
Team Work	25	25.54	28.43	21.03

Table-6 : Talent Management Practices Perspective – Work Experience

	Less than 2 Years	2-5 Years	6-10 Years	11-15 Years	16-20 Years	More than 20 Years
Customer Focus	16.24	18.19	15.62	18.01	16.5	15.44
Salary and Benefit	15.18	17.55	17.75	18.83	15.31	15.38
Developmental Plan for Staff	14.69	17.12	17.2	17.36	17.99	15.63
Innovation	15.47	17.2	18.67	18.2	15	15.47
Managing Performance	14.52	16.8	17.84	19.14	16.02	15.69
Quality Commitment	15.44	16.85	18.2	18.79	15.59	15.14
Results Orientation	15.01	16.87	18.51	17.66	16.08	15.87
Stimulating Open Climate	15.72	16.25	17.39	18	16.72	15.92
Team Work	15.4	17.19	18.48	17.48	15.83	15.62

When analyzed based on talent management practices perspective in context to work experience; Stimulating open climate, Customer focus and results orientation are the most preferred dimensions for enabling employee engagement as per the work experience categorization.

Conclusion

The assumption that there is already talent management covered just because there is HR at a company. Talent management rarely happens naturally. There must be a strategy that is tailored to one's business alone. Only by this a company can obtain and retain top talent and gain a competitive advantage over other businesses in your industry. Talent needs to be recognized as the critical element of the strategy formulation and implementation in CPSEs. The strategic and effective management of organizational talent requires a process and this process needs to be driven by the strategic needs of the organization. Strategic positions required to implement the business strategy and achieve its objectives need to be identified. TM has become an imperative in the face of today's business challenges facing CPSEs. The corporate world is increasingly realizing that successful TM is the key to high performance. By assessing available talent, placing the right people in their best roles and finally retaining them could only help organizations surviving and thriving in today's increasingly competitive markets. The real fuel behind a company's growth and success comes from its people.

Way Forward

CPSEs should reinvent TM in the digital world. Companies that adopt digital labor platforms early and develop a more analytic and integrated approach to the workforce stand to gain significant advantages. Digital platforms could reduce the transaction and interaction costs of many day-to-day HR tasks; boost efficiency, innovation, customer service, and employee engagement; and reduce attrition. Many private sector companies have invested heavily to apply digital tools and big data analytics to other corporate functions but have hesitated at the doors of HR, where human judgment has always been central. They are understandably skeptical about the idea that a more quantified approach to hiring can replace an interviewer's "gut feeling." External studies and our own research reveal that the analytic approach reduces personal bias combined with human judgment, and helps to land better hires. New technologies can demonstrably improve the customer experience while holding down the costs of attrition and training—and improving the workplace experience.

Proactive culture of development and performance management is needed to support the values and goals of the organisation. The talented employees have to be identified and programs should be conducted for retaining those employees. Organisations should focus on strengths and potential of talented candidates so that their career goal can be framed.

References

Bradley, A.P. (2016) Talent management for universities, *Australian University Review,* Vol.58, No.1, pp.13-19.

Cannon, J. and McGee, R. (2011) Talent management and succession planning, (2nd ed.), Chartered Institute of Personnel and Development.

CIPD. (2006) Talent management understanding the dimensions*, Chartered Institute of Personnel and Development* from http://www.Cipd.Co.Uk/Nr/Rdonlyres/6101aa06-F0c7-4073-98da-758e 91c718fc/0/3832talentmanagement.Pdf (accessed 28 November 2019).

Devine, M., & Powell, M. (2008) Talent management in the public sector. The Ashridge Journal. From http://www.ashridge.com/website/IC.nsf/wFARATT/Talent%20Management %20in%20the%20Public%20Sector/$fileTalentManagementInThePublic Sector.pdf (accessed 15 November 2019).

M., Buttiens, D. (2017). Talent management in public sector organizations : A study on the impact of contextual factors on the TM approach in Flemish and Dutch public sector organizations. *Public Personnel Management,* Vol.46, No.44.

Mathe et al. (2016) Significance of talent management in public sector enterprises in India – A case study, *International Journal of Recent Research Aspects*, Vol.3, No.1, pp.95-99.

Maya, M., and Thamilselvan, R. (2012) Employee perception towards talent management Strategies - an empirical study with reference to software companies in Chennai city, *International Journal of Management*, Vol.3, No.1, pp.171-176.

People Matters. (2018) Bell curve might not be helping in differentiating performance : Survey, April issue. from https://www.peoplematters.in/news/performance-management/bell-curve-might-not-be-helping-in-differentiating-performance-survey-17968

Pollitt, C., and Geert, B. (2004) Public management reform – Comparative Analysis (2nd ed.), New York : Oxford University Press, Oxford.

Poocharoen, O., and Lee, C. (2013) Talent management in the public sector – A comparative study of Singapore, Malaysia and Thailand, *Public Management Review*, Vol.10, No.10, pp.1185-1207.

Rana, G., Goel, A., and Rastogi, R. (2013) Talent management : a paradigm shift in Indian public sector, *Strategic HR Review,* Vol.12, No.4, pp.197-202.

Sita, V., and Pinapati A. (2013) Competency management as a tool of talent management : A study in Indian IT organizations, *Journal of Economic Development, Management*, IT, *Finance, Marketing,* Vol.5, No.1, March, pp.44-56.

Talent matters. (2017) Deloitte University Press. from https://www2.deloitte.com/content/dam/insights/us/articles/3422-Talent-matters/ER_3422_Talent%20matters_vFINAL.pdf (accessed 28 December 2019).

Tiwari, U., and Shrivastava, D. (2013). Strategies and practices of talent management and their impact on employee retention and effectiveness, *The International Journal of Management,* ISSN 2277-5846, Vol.2, Issue 4, (October, 2013), India www.theijm.com

Ulrich, D. (2006) The talent trifecta, *Workforce Management*, September, pp.32-33.

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Housing for All : PMAYU India

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India is one of the fastest growing economies in the world, where rich persons are becoming richer and poor are becoming poorer. Since a decade the Government of India has laid-down and introduced many plans, policies and schemes in order to enhance the standard of living of the poor. This study discusses Pradhan Mantri Awas Yojana (PMAY) Urban schemes benefits, progress, houses sanctioned, houses grounded, houses completed, central grants committed, central grants released and total investments in constructing and developing urban infrastructural facilities.

Keywords : PMAY Urban Scheme, Progress, Houses Sanctioned, Houses Grounded, Houses Completed, Central Grants Committed, Central Grants Released, Total Investments.

Overview of the Scheme

PMAY Urban is a mission of the central government implemented on 25th June 2015. It focuses on urban housing shortages and makes sure that housing for all eligible urban households under the Economically Weaker Section (EWS), Low Income Group (LIG) and Middle Income Group (MIG) shall be covered by the year 2022 through the following program verticals :

- Slum rehabilitation with participation of private developers using land as a resource.
- Promotion of affordable housing for weaker sections of the society through credit linked subsidy.
- Affordable housing in partnership with public and private sectors.
- Subsidy for beneficiary-led individual house construction.

Central/State Nodal Agencies, Local Bodies and lending institutions are main players in the implementation of PMAY urban scheme.

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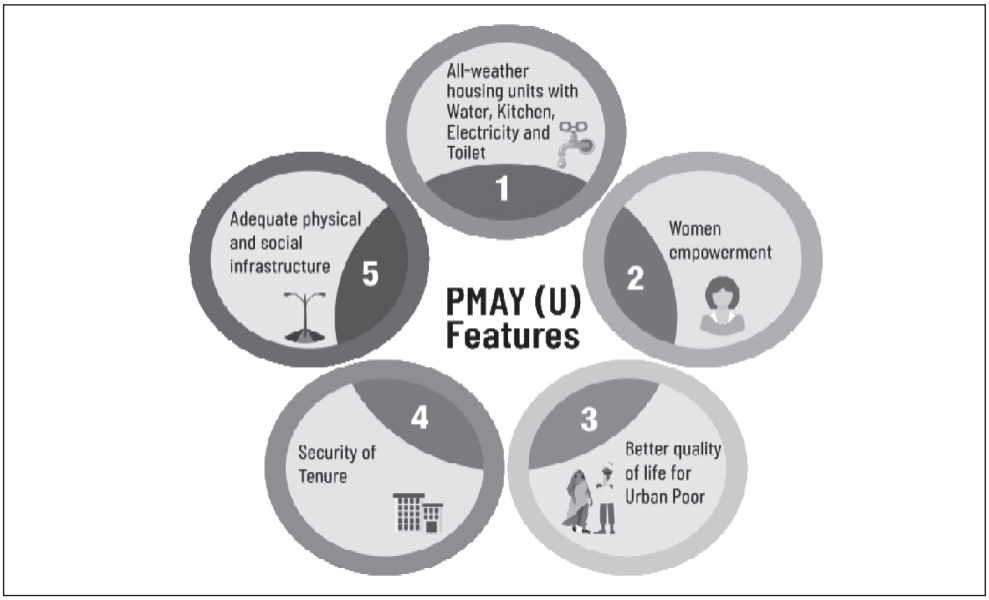


PMAY mission covers urban areas with the initiatives of urban planning and development. Houses under the scheme must have basic amenities – water supply, electricity, toilet, kitchen, etc.

The scheme enhances women empowerment by providing ownership of houses or jointly. The preference is given to senior citizens, minority, single women and weaker sections of the society.

Mission ensures distinguished living to families along with safety, security and pleasure of ownership to the beneficiaries.

Study Objective

Objectives of the study are as follows-

a) To study and understand PMAY Urban an affordable housing for all schemes in India;

b) To analyse the components of scheme of PMAY Urban;

c) To analyse the credit link subsidy scheme of PMAY Urban;

d) To find out the overall progress of PMAY Urban scheme;

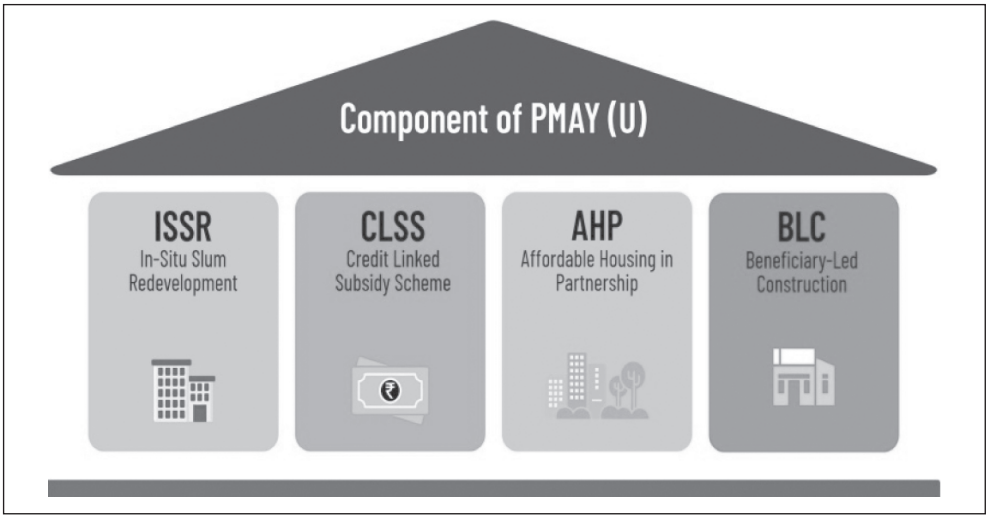
e) To evaluate the state-wise progress of PMAY Urban scheme; and

f) To analyse the impact assessment of PMAY Urban on the weaker section of society.

Components of PMAY-U

The PMAY Urban scheme matches the expectations of families on the basis of geographical and economic conditions, land availability, infrastructural facilities etc.

Components of the PMAY-U Scheme



a) In-Situ Slum Redevelopment

Financial assistance of ₹1 lakh per house is allowable for eligible families under the scheme using land with the involvement of private developers.

b) Credit-Linked Subsidy Scheme

Beneficiaries from EWS, LIG, MIG-I and MIG-II looking for housing loans from banks or HFCs are eligible for subsidy up to ₹6 Lakh, ₹9 lakh and ₹12 lakh respectively.

The Government has chosen HUDCO, NHB and SBI as the nodal agencies to execute Credit-Linked Subsidy Scheme (CLSS) to the beneficiaries and the salient features presented in Table-1 and the physical progress in Table-2 are largely self-explanatory.

c) Affordable Housing in Partnership

Financial assistance of ₹1.5 lakh per house is given, subject to 35 per cent houses in the project are from EWS category. States may give additional concessions like State share, affordable land, stamp duty concession, etc.

d) Beneficiary-led Individual House Construction or Enhancement

Financial assistance up to ₹1.5 lakh per house is given to the eligible family's house construction or enhancement.

The physical progress and central assistance under the scheme of PMAY-U are highly impressive. Under the dynamic leadership and governance of Hon'ble Prime Minister Shri.Narendra Modi ji, the mission for affordable housing for

Table-1 : Broad Features of Credit-Linked Subsidy Scheme (CLSS)

Components	EWS	LIG	MIG-I	MIG-II
Income (₹)	<3 Lakh	3-6 Lakh	6-12 Lakh	12-24 Lakh
Carpet area	30 sq. met.	60 sq. met.	160 sq. met.	200 sq. met.
Interest subsidy	6.5%		4%	3%
Maximum loan tenure	20 Years			
Eligible loan amount	₹6 lakh		₹9 lakh	₹12 lakh
Discounted NPV	9%			
Amount for subsidy	2,67,280		2,35,068	2,30,156
Monthly savings @ 10% interest	2,500		2,250	2,200

Source : pmaymis.gov.in

Table-2 : PMAY (Urban) Progress (Since 2015-16 to 2020-21)
Physical Progress

	Number of Houses in Lakhs					
Particulars	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
Houses Sanctioned	7.26	16.76	41.63	80.33	103	112.52
Houses Grounded	9.86	17.52	36	52.67	60	80.2
Houses Completed	7.27	11.02	19.43	26.18	32	48.02

Source : pmaymis.gov.in

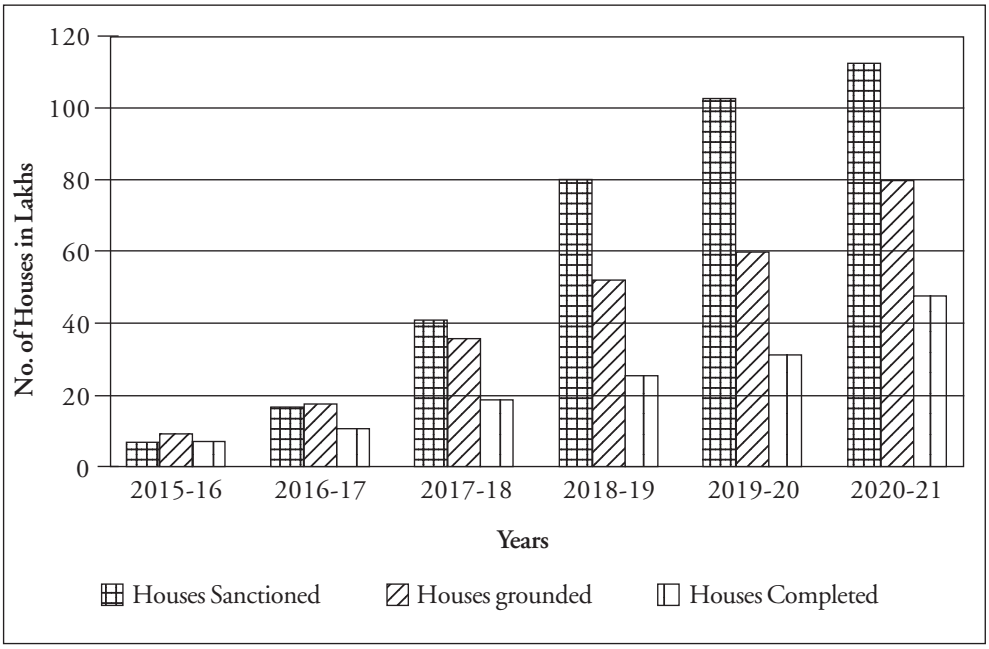
Central Assistance

						₹ in Crores
Particulars	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**2020-21**
Sanctioned	12,192	26,437	64,352	1,24,590	1,63,181	1,81,000
Released	3,223	7,821	24,352	49,424	64,000	95,777
Utilized	491	2,015	6,605	25,614	49,717	79,900

Source : pmaymis.gov.in

all is victorious. The Government of India achieved a dream of 1 crore houses under urban transformation through housing for all.

Physical Progress of PMAY-U India



Central Assistance of PMAY-U India

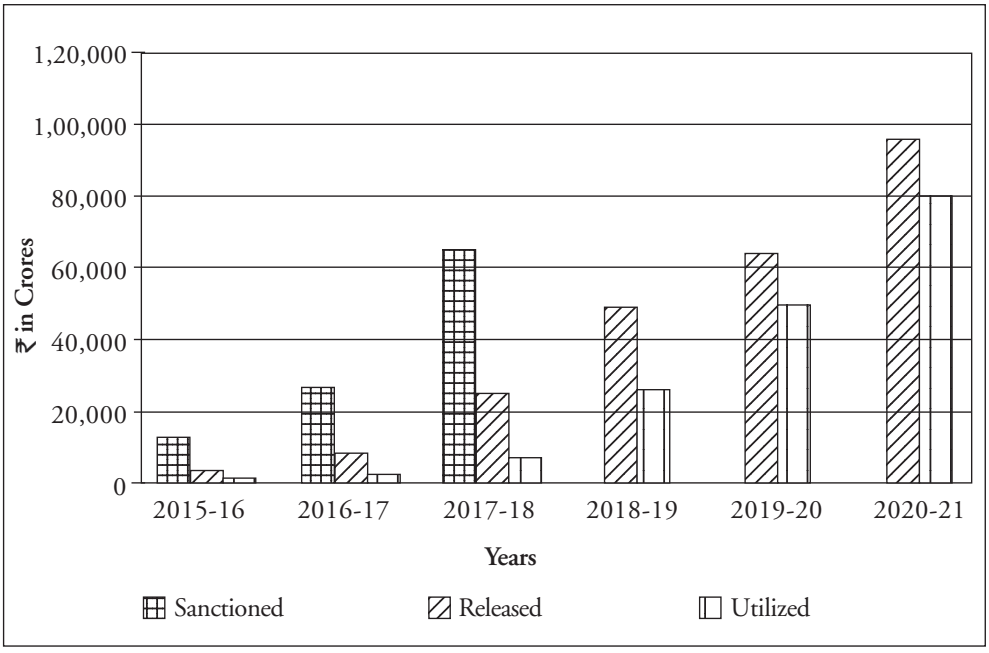


Table-3 : PMAY (Urban) State-wise Progress (Since 2015-16 to 2020-21)

S.No.	Name of the State/ Union Territory	Project Proposals Considered	Physical Progress (Nos.)			Financial Progress (₹ in Crores)		
			Houses Sanctioned	Houses Grounded	Houses Completed	Central Assistance		
						Investment	Sanctioned	Released
1	Andhra Pradesh	1,023	20,31,612	12,43,426	4,23,714	90,032.23	30,801.85	9,993.33
2	Bihar	505	3,62,611	2,14,134	92,408	19,778.87	5,655.13	2,416.76
3	Chhattisgarh	1,639	2,64,239	2,10,807	1,37,838	11,666.02	4,071.46	2,475.43
4	Goa	10	3,902	3,844	3,844	772.34	89.40	88.86
5	Gujarat	1,473	7,76,240	7,03,667	5,39,835	72,613.00	14,393.56	10,422.77
6	Haryana	538	2,81,578	73,987	41,115	28,419.09	4,568.32	1,103.35
7	HP	209	12,415	10,660	5,459	746.11	218.83	120.94
8	Jharkhand	405	2,14,521	1,64,996	1,01,789	13,721.83	3,284.36	2,248.58
9	Karnataka	2,601	6,79,748	4,47,148	2,37,369	47,833.47	11,020.45	4,768.09
10	Kerala	510	1,26,674	1,19,445	96,943	6,582.31	2,065.69	1,423.21
11	MP	1,536	8,44,786	7,53,919	4,34,051	46,302.60	13,505.22	9,212.82
12	Maharashtra	1,167	12,86,368	7,09,224	4,41,082	1,43,825.03	21,106.58	9,687.75
13	Odisha	718	1,74,660	1,27,717	93,795	6,909.27	2,743.58	1,532.34
14	Punjab	885	1,05,359	75,686	40,626	6,225.86	1,734.34	984.71
15	Rajasthan	401	2,19,711	1,48,760	1,22,173	16,286.33	3,869.08	2,095.26

(Contd...)

16	Tamil Nadu	3,689	7,05,903	5,88,028	4,14,641	44,449.89	11,163.03	6,753.84
17	Telangana	286	2,17,171	2,28,664	1,87,555	25,476.10	3,725.91	2,581.24
18	Utter Pradesh	4,393	17,75,638	12,61,861	7,89,412	81,418.43	27,543.64	15,226.65
19	Uttarakhand	226	43,113	26,021	19,282	3,379.65	809.97	530.94
20	West Bengal	532	5,24,232	3,91,434	2,69,057	28,131.34	8,275.27	5,088.30
	Sub-Total (States)	**22,746**	**1,06,50,481**	**75,03,428**	**44,91,988**	**6,94,569.78**	**1,70,645.68**	**88,755.18**
21	AP	48	7,426	7,808	3,391	445.16	166.98	113.38
22	Assam	370	1,37,390	1,00,100	29,253	4,356.79	2,078.92	972.91
23	Manipur	40	53,128	37,315	5,510	1,364.04	797.34	338.06
24	Meghalaya	36	5,324	2,273	1,649	288.35	85.24	21.34
25	Mizoram	52	39,793	17,634	4,539	851.20	606.79	188.42
26	Nagaland	75	34,223	26,795	5,666	1,119.15	539.29	272.69
27	Sikkim	11	574	577	281	20.50	8.95	4.09
28	Tripura	83	86,501	63,910	52,505	2,662.63	1,390.82	1,022.33
	Sub-Total (NE States)	**715**	**3,64,359**	**2,56,412**	**1,02,794**	**11,107.82**	**5,674.34**	**2,933.22**

(Contd...)

29	A&N Island	2	602	47	43	155.85	9.20	0.89
30	Chandigarh	-	1,410	6,370	6,370	280.40	31.25	31.25
31	DNH & DD	9	7,408	6,959	4,751	614.28	145.58	123.63
32	Delhi (NCR)	-	24,027	64,607	48,007	4,721.90	542.42	542.42
33	J&K	332	56,054	35,853	10,457	3,139.41	855.30	321.57
34	Ladakh	8	1,777	1,028	421	84.85	36.67	17.28
35	Lakshadweep	-	-	-	-	-	-	-
36	Pondicherry	38	14,631	14,295	6,040	840.22	231.20	160.26
	Sub-Total (UT)	**389**	**1,05,909**	**1,29,159**	**76,089**	**9,836.90**	**1,851.63**	**1,197.30**
	Grand Total	**23,850**	**112.52 L**	**80.20 L**	**48.02 L**	**7.35 L Cr.**	**1.81 L Cr.**	**95,777 Cr.**

Source : https://pmay-urban.gov.in/uploads/progress-pdfs/606d58a290166-4.pdf, pmaymis.gov.in [as on 5th April, 2021]

The data presented in Table-3 captures state-wise and territory-wise progress of PMAY Urban scheme in India. Andhra Pradesh, Uttar Pradesh and Maharashtra are the States leading in sanctioning of houses, grounding of houses as well as completion of houses. These States are at the top in performance of PMAY Urban scheme with more than 50 per cent beneficiaries out of all the states.

The Government of India has not only sanctioned ₹1.81 lakhs crore under the scheme of PMAY Urban across the nation but also released ₹1 lakhs crore to the beneficiaries as of now and poised to continue successfully in the future too.

Results and Discussion

a) Simple Linear Regression and Correlations Output

Interpretation : Descriptive statistics provides a mean and standard deviation for selected variables. The researchers have used standardized values; therefore means for variables are 36693.0513, 9137.0069 and 4763.3690 respectively. Besides it is noticed that the standard deviation is large, so it needs to be minimised in terms of the variation between investment, central assistance sanctioned, and central assistance released to increase the performance of the PMAY.

Descriptive Statistics

	Mean	Std. Deviation	N
Investment	36693.0513	112469.19353	39
Central Assistance Sanctioned	9137.0069	27572.83948	39
Central Assistance Released	4763.3690	14284.28770	39

Correlations

		Investment	Central Assistance Sanctioned	Central Assistance Released
Pearson Correlation	Investment	1.000	0.993	0.992
	Central Assistance Sanctioned	0.993	1.000	0.996
	Central Assistance Released	0.992	0.996	1.000
Sig. (1-tailed)	Investment	-	0.000	0.000
	Central Assistance Sanctioned	0.000	-	0.000
	Central Assistance Released	0.000	0.000	-
N	Investment	39	39	39
	Central Assistance Sanctioned	39	39	39
	Central Assistance Released	39	39	39

The accompanying Table provides a correlation matrix along with probability values for selected variables. The study has three variables and two correlation coefficients. Correlation of 0.992 ((Sig.(1-tailed)<0.0005) and 0.996 ((Sig.(1-tailed)< 0.0005) interprets that there is a strong positive relationship between investment, central assistance sanctioned and released. The selected variables are inter-correlated and show significant correlation. It interprets that the investment is dependent on central assistance sanctioned and central assistance released.

b) P-P Plot of Simple Linear Regression Model

Researchers have developed a P-P Plot to check if residuals are normally distributed.

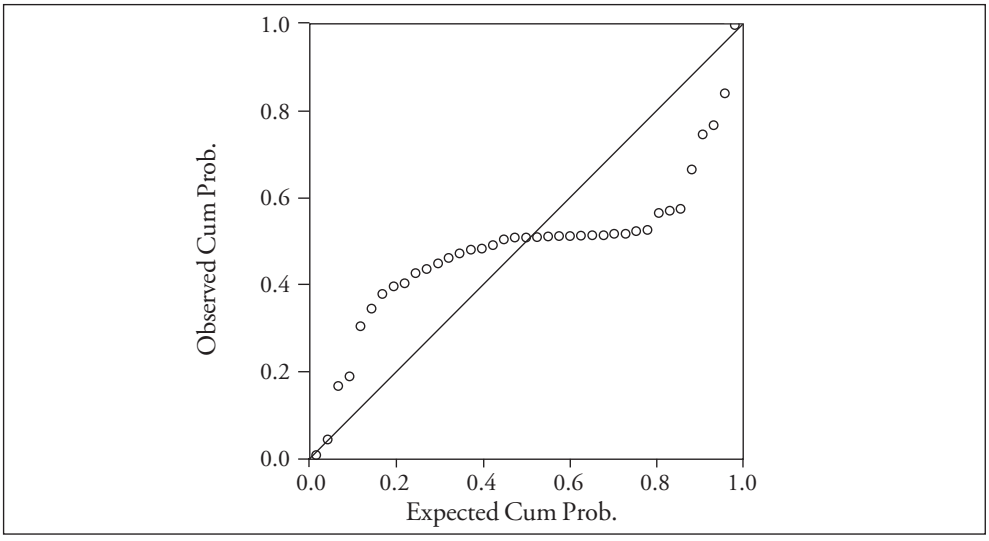
The P-P Plot was used to compare the observed residuals with which residuals are normally distributed. The normally distributed residuals are represented by small dots. We can see departures at the observed cumulative probabilities of 0.2, 0.4, 0.6 and 0.8, the data is normally distributed. Researchers can use this data to forecast the future trend and derive an idea of the future investment pattern.

Conclusion

The rapid growth of population in urban India is leading to shortages of housing and poor urban living conditions are the prime challenges in front of the government.

It was observed that since independence the government has introduced and implemented housing development schemes.

Normal P-P plot of Regression Standardized Residual
Dependent Variable : Investment



Recently launched PMAY Affordable Housing for All (Urban) Schemes has drawn high attention by economically weaker sections of people of India.

Looking at the scenario and progress of PMAY Urban Scheme, it is highly appreciated by Indians across the nation and got an overwhelming response.

The uniqueness of this scheme is the government has offered CLSS scheme for EWS/LIG, MIG-I and MIG-II of ₹2,67,280, ₹2,35,068 and ₹2,30,156 respectively.

The government has released central assistance of ₹1 lakh crores under CLSS in the bank accounts of beneficiaries through Direct Benefit Transfer.

The study has analysed the impact of PMAY Urban – Affordable Housing for All schemes on Economically Weaker Sections in India.

Pedagogical Objectives

1. Discuss the PMAY Urban Affordable Housing for All schemes from the perspective of urban development.
2. Analyse the components of PMAY Urban scheme and their offerings in a nutshell.
3. Why is the credit link subsidy scheme of PMAY Urban highly appreciated by Indians?
4. Analyse the overall physical progress of PAMY Urban scheme across the nations.
5. Evaluate the State-wise progress and disbursement of funds under the scheme of PMAY Urban in India.
6. Find out the financial progress, funds sanctioned and released under PMAY Urban scheme by the Government of India.
7 What is the impact and assessment of the PMAY Urban scheme on the weaker section of society?
8. Is the mission of the Government of India affordable housing for all successful?

End-Notes & References

1. Gill, H. S., & Sharma P. K., (2014).Smart cities and affordable housing in India. The International Journal of Business & Management, 2 (8), pp.68-73.
2. https://pmaymis.gov.in/
3. http://mohua.gov.in/cms/case-studies-success-stories.php
4. https://www.rbi.org.in/
5. http://mohua.gov.in/
6. Kohli, V.K. (2007). *Housing finance agencies in India,* Deep and Deep Publications, New Delhi.
7. Lal, A.K. (1995). *Handbook of low cost housing,* New Age International Private Ltd., New Delhi.
8. Ministry of Housing & Urban Poverty Alleviation (2017). Pradhan Mantri Awas Yojana (Urban) Housing for all : Credit linked subsidy scheme for EWS/LIG; Operational Guidelines; Government of India, New Delhi.
9. Vaidyanathan, R., & Mary, F. (2020) Progress and prospects of PMAY scheme in India. The International Journal of Analytical and Experimental Modal Analysis, XII, (I), January.

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Occupational Health and Safety Management in Bharat Electronics Ltd. : A Case Study

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The case study summarizes the various hazards and safety concerns faced by the workers of the electronics and defence public sector undertaking -Bharat Electronics Ltd. (BEL) in India, and its approach to employee safety, health, and wellness. It elaborates the Occupational Health and Safety Management (OHSM) system of BEL and its Occupational Health & Safety (OH&S) policy. It describes the common risks and health hazards, both physical and chemical perils, faced by the workers employed in hazardous roles like welding, semiconductor wafer fabrication jobs, soldering, waste disposal etc. Next section elaborates the hiring criteria of workers and different training provided to them. The structure of Safety Committee and its role in the organization, along with the duties of Safety Officer, has also been discussed. The case study also gives an overview of the implementation of international standard ISO 45001:2015 adopted by the company to improve occupational health and safety, eliminate hazards and minimize OH&S risks (including system deficiencies) and address OHSM system non conformities associated with its activities. Precautions taken by the company to ensure safe working conditions for its employees during the COVID-19 pandemic and future goals of the company with respect to OHSM have also been discussed.

Keywords : Occupational Health, Safety Management, Risk Assessment, ISO Certification, BEL.

Introduction

The objective of this OHSM case study is to present which practices related to occupational safety and health are being developed in the electronics industry citing the example of Bharat Electronics Ltd. To identify the practice of ISO 450001 implemented using the available tools for management

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of occupational health and safety (OH&S), and to identify its implementation and cost. The safety management elements were identified, and the practices were analyzed.

The goal of an OH&S program is to promote safe and healthy occupational life. Occupational Health and Safety Management (OHSM) is the branch of healthcare that deals with all aspects of health and safety at the workplace.

ISO 45001 is an International Organization for Standardization (ISO) standard for the management systems of occupational health and safety (OH&S). It was published in March 2018. The goal of ISO 45001 is to reduce occupational injuries and diseases, including promoting and protecting the health of the workers, both mental and physically, in the occupation. Occupational health can be defined as the highest degree of mental, physical and social well-being of individuals within the occupation.

The factors which pose a risk or hazard to the health and safety of the workers at the workplace are physical agents like noise, vibrations and radiation, chemical agents, biological agents or physical hazards like falling, workplace transport, dangerous machinery, and electricity, and work-related stress. Therefore, for any OH&S measure to be effectively implemented, it is of prime importance that the risks and the hazards are identified correctly, and the potential damage that they can cause is assessed realistically. Then corrective measures are implemented to reduce the hazard. Advancing technology, discovery, and inventions of new materials, new processes, and techniques of manufacturing have all added on to the requirement of continually reviewing the occupational safety and health standards.

According to the Joint International Labour Organization (ILO)/World Health Organization (WHO) Committee on Occupational Health, "The main objectives of occupational health are :

- Maintaining and promoting the health of workers and their working capacity.
- Improving the environment in which they work and their work to become good for safety and health, and
- Developing the work organizations and their working cultures in a way that supports the health and safety of the workers and also promote a positive atmosphere and smooth operation and may also enhance the productivity of the undertakings."[1].

About BEL

Bharat Electronics Limited (BEL) is one of the nine Public Sector Enterprises (PSEs) under the Ministry of Defence under the Indian Government; it is primarily into defence related equipment production. It has around nine factories and several regional offices across India and corporate office at Bengaluru. It was founded in Bengaluru, Karnataka, in 1954.

It primarily manufactures advanced electronic and defence products for the Indian Armed Forces. It offers products and services in a vast range of technology like Radars, Naval Systems, Military Communications, Electronic Warfare Systems, Telecommunications, Sound and Vision Broadcasting, Tank Electronics, Opto-Electronics, Solar Photovoltaic Systems, Embedded Software, and Electronic Components. With the experience developed over the years, the company also provides Turnkey systems solutions. Some products are also manufactured with the help of ToT (Transfer of Technology).[2]

Hazards in Electronics Industry

Types of manual/manufacturing works carried out in BEL are welding, soldering, plating, painting, FRP work (Fibre-reinforced plastics), water treatment, working with the generator, working in hazard disposal areas.

Chemical Perils

Various chemicals are used in any electronics industry. These chemicals can be toxic or corrosive. Although most of these are generally used in isolated and enclosed workspace, there can be accidental exposures and leaks. Cleaning agents like acids, soldering materials like tin and lead alloys, and soldering fluxes are common chemicals used. Dermatitis, asthma, neuropsychological impairment are some of the problems that can be caused by different chemicals at different levels of exposure.

Physical Perils

Noise and radiations can cause physical hazards in an electronics industry. Radiations can be ionising or non-ionising and can cause hazards on accidental exposure. Apart from this enclosed clean rooms have very low humidity, a factor that is known to cause dermatological symptoms. Musculoskeletal problems can be caused due to continuous assembly line work. Eye Strain can be caused due to prolonged visual inspection works, requiring the use of microscopes.

Typical effects(based on Exposure) on the human body.[3]

Nature of Electrical Accidents

Three common root causes of an electrical accident

Exposure	Current Effect
0.5 - 3 mA	Tingling sensations
3 – 10 mA	Muscle contractions (painful)
10 – 40 mA	"Can't Let Go" phenomena
30 – 75 mA	Respiratory paralysis (possibly fatal)
100 – 200 mA	Ventricular fibrillation (likely fatal)
200 – 500 mA	Heart clamps tight
1.5 A	Tissue and organs begin to burn

1. Using equipment that is untested and unsafe
2. Unsafe environment and working condition (i.e. wet environment/ presence of flammable vapours); and
3. Unsafe work performance

Personal Protective Equipment (PPE) is an essential part of any employee's safety program. According to OHSA, the use of PPE is an efficient way to protect the workers, but still, they should only be used as a final line of defence. There are certain restrictions in the usage of PPEs, and all the workers must be fully aware of those.

BEL uses the following different PPEs :

- PPE for the Head
- PPE for the Eyes & Face
- PPE for the Body (Flame Resistant Clothing)
- PPE for the Hands (Gloves)

Maintenance of PPE

PPE and insulating equipment must be inspected properly, for damage before each day use, and anytime damage is suspected. PPEs can be damaged and can become unfit for use due to the following :

- Embedded foreign objects (metal slivers, splinters)
- Holes, punctures, tears or cuts
- Ozone damage (fine cracks)
- Swelling, softening, sticky or hardening
- Damage from chemicals

Protective Equipment Testing Schedule of BEL

Training for PPE

All the BEL employees who are required to use PPE are given prior training so that they know very well :

Equipment	When to Test
Gloves	Before the first issue of the equipment and every six months after that
Blankets / Sleeves	Before the first issue of the equipment and every 12 months after that
Line Hose / Covers	Upon indication that insulating value is devalued

1. When PPE is required
2. What kind of PPE is required
3. How to use, wear and adjust the PPE
4. How to dispose and maintain of the PPE

Apart from these, the employees are also made aware of the limitations of different PPEs. If the trained workers still lack the understanding or skills required to use PPE, then re-training is done. If there are significant changes in the workplace or the type of PPEs in use, then also, the workers are re-trained.[4]

Hiring Criteria and on the Job Training

Before getting hired, the applicants need to pass certain medical tests apart from the job-specific tests. Medical tests include eye testing for inspection jobs, blood pressure testing and diabetes testing for hazardous works like welding and soldering, audiometry tests for noisy works.

Before the start of the job, OJT (On Job Training) is mandatory according to the company guidelines. They are trained about how to use the equipment, how to use the chemicals, and what are safety precautions. Emergency training is also provided. In case of any hazards, they are trained how to address and report these hazards. They are trained to use/read datasheets (a document providing the specification for a particular product).

Safety Committee in BEL

Safety committee in BEL is a perfect equilibrium of executives and workers participation. Persons from every department/division are being nominated/elected; they represent their department/division in the safety committee. These representatives are responsible for presenting the issues faced by the workers of their division related to workplace safety and health hazards and work together to build viable solutions to the problems faced. The safety officer is the secretary of the Safety Committee, and the committee is headed by one of the top management officials, who acts as the chairman of the committee.

Roles and Duties of the Safety Officers

The safety officers are responsible for developing safety policies which are to be followed by every employee so that the workplace is free from any health and safety hazard. They are responsible for identifying hazards at the workplace and any unsafe conditions. They participate in planning meetings to identify health and safety concerns associated with any work. They verify and inspect all the equipment on a weekly or monthly basis. In case the equipment is damaged, then they are responsible for the repair of equipment. In case of either major or minor accidents, they are responsible for finding the cause of the accident along with investigating further dangers on site. Also, they form rules and policies, in such a way that the accidents in the future could be avoided. They carry out drills and exercises to train the employees to manage emergencies. Safety training programmes are conducted and managed by them, along with a review of excavation and electrical safety. A review of existing rules and policies is done by them, along with the updating policies in accordance with legislation. They conduct risk assessment and enforce preventive measures. They prepare reports on the occurrences of hazards and provide statistical information to the management and carry out Permit-to-Work (PTW) monitoring and review.

Precautions Taken by BEL During Covid-19

BEL has implemented various preventive measures to ensure the health and safety of its employees during the Covid-19 pandemic and continuity of its business activities.

The measures taken by the company comply with their internal health and safety policies and are aligned with the guidelines of the Government of India (GoI) and recommendations provided by the Centres for Diseases Control and Prevention (CDC)and the WHO. BEL strictly observes social distancing, use of hands-free sanitizers and masks. It promotes regular and thorough sanitization of their entire workplace once a week.

After the factory was officially opened to be operated regularly, BEL implemented the following measures :

- Concept of staggered entry was implemented, i.e. 1,600 people were divided in a balanced way to form 3 shifts. Only $1/3^{th}$ of the employees were present in the factory at a time.
- At the main entrance gate, hands-free sanitizers are installed, and temperature screening using a no-contact thermometer is carried out.

- Stickers were placed on the roads and floors to maintain social distancing.
- Biometric punches were converted to card punches to avoid touching the surface.
- Workplaces in the factory and corporate offices are sanitized thoroughly using sodium carbonate once a week.
- Every entry and prominent places around the workplace have hands free sanitizers.
- People are asked to bring their own sanitizers for more safety and are required to wear masks.

Some other precautions taken by the company are :

- Employees of 55 years of age and above were tested for their oxygen levels.
- Employees having comorbities were tested twice for their oxygen levels.
- Oximeters as safety kits were distributed in all the divisions. Punching clock was there, in need of an oximeter. The workers could punch their cards and collect their kit.

Safety Measures Adopted by BEL

BEL uses the following for ensuring safety from electrical hazards :

- De-energize the circuit
- Work Practices
- Insulation
- Guarding
- Ground Fault Circuit Interrupters (GFCI)
- Grounding (secondary protection)
- Barricades, along with safety signs, are also useful to prevent accidents.
- Corrosive safe and non-slip flooring.
- Exhaust ventilation in territories where harmful gases or vapour are radiated;
- Insurance of electrical hardware and material from wet or moist environmental factors;
- Restriction of eating, drinking, and smoking in work regions;
- Eye-shower and medical aid gear; and
- Defensive dress including gloves, rain boots, eye assurance, corrosive safe articles of clothing made accessible and worn;

ISO-45001 Implementation and OH&S Policy in BEL

BEL has implemented ISO 45001:2018, which specifies requirements for an

occupational health and safety (OH&S) management system. It allows organizations to provide a safe and healthy workplace by preventing ill-health and work-related injuries, as well as by proactively improving its OH&S performance. In the case study till now we have discussed the safety hazards faced by the workers in BEL, ISO 45001:2018 is a recent measure taken by the company for improving worker safety, reducing workplace risks and hazards and creating better, safer working conditions.

Leadership and Commitment

Top management in BEL demonstrates leadership and commitment concerning the OHSM system of the organization :

1. They take overall accountability and responsibility for the prevention of ill health of the workers and work-related injury, as well as the provision of safe and healthy workplaces and activities;
2. They ensure that the OH&S policy of the company and related OH&S objectives are established, communicated and documented and are compatible with the strategic direction of the organization;
3. They ensure that the resources needed for OHSM system are available;
4. They communicate the importance of effective OHSM and of conforming to the OHSM system requirements;
5. They ensure that the OHSM system achieves its intended outcome(s);
6. They develop, lead and promote a culture in the organization that supports workers health and safety;
7. They ensure that the organization establishes and implements a mechanism for participation and consultation of workers and encourages the establishment and functioning of health and safety committees in the organization.

OH&S Policy

Top management, along with the recommendation of the safety committee and in accordance with the standards, statutory and legal requirements, has established the OH&S policy for BEL that :

1. includes a commitment to provide a healthy and safe workplace for the prevention of work-related injury and ill-health.
2. includes a provision to identify OH&S risks and hazards in the workplace.
3. provides a framework for setting the OH&S objectives;

4. includes a provision of consultation and participation of workers, and workers' representatives along with the formation of the safety committee and various bodies at different organizational level to address worker's concerns and issues.

The OH&S policy is available as documented information. It is communicated within the organization to the workers and the interested parties through published minutes of meetings, official circulars, updates on website and daily bulletin.

Under ISO-45001 implementation, BEL follows a four-step iterative management method to control and continuously improve the health and safety processes to safeguard workers.[5]

The Planning Phase

The "Plan" Phase of ISO-4500 compromises of actions to address risks and opportunities and OH&S objectives and planning to achieve them. Planning is a continuous process, anticipating and adapting to changing circumstances and determining risks and opportunities, continually both for the workers and for the OHSM system.

Planning encompasses hazard identification, assessment of risks, determining legal requirements and other requirements, i.e. other commitments the organization had made and setting objectives for improvement. The Risk Management Committee is responsible for carrying out the planning phase efficiently.

The risk management framework of BEL has three-tier structure, with the Board of Directors (BoD) (represented by Risk Management Committee (RMC) of the Board) at the Apex Level and the Corporate Risk Management Committee (CRMC) at Corporate Level and Unit Risk Management Committees (URMCs) at the SBUs/ Units/R&D Centres. If it is higher than the threshold value, BEL appoint a risk manager (for proper structured risk management). Appointment of safety managers is a part of risk management. The company level risks are monitored by CRMC, which is headed by a "Functional Director," and senior management of corporate at general manager level are its members.

Hazard Identification

Hazards can be defined as a 'source with a potential to cause injury and ill-health. Hazard identification helps the organization to recognize and understand the potential hazards in the workplace and to the safety and health of workers, in order to assess, prioritize and eliminate hazards or reduce OH&S risks. When considering hazards, the organization considers most likely to occur as well as hazards that have the most impact

and can lead to the most significant risks to the organization.

Hazard identification includes normal day-to-day work activities, along with non-normal days (e.g. absenteeism cover and holidays) or events that cause additional pressures on work schedules. It should also include routine and non-routine activities, e.g. maintenance and breakdowns, as well as what happens when things do not go as planned, e.g. staff accidents or incidents, emergency protocols being implemented, the very nature of these non-normal events can lead to hazards in themself. Say, for example, a fire evacuation, if not managed in a controlled manner it could lead to risks to workers and any responding emergency services.

Assessment of Risks of the OHSM System

OH&S risk can be defined as the combination of the probability of occurrence of a work-related hazardous event and the severity of the injury and ill-health that can be caused by that event to the workers. After identifying various hazards related to the health and safety of the workers, the organization assesses OH&S risks from these identified hazards, while taking into account the effectiveness of existing controls. The organization also determines and assesses other risks related to the establishment, implementation, operation and maintenance of the OHSM system.

It then prioritizes and analyses different kinds of risks using risk score. Based on risk score, each risk is categorized into different impact ranges-very low, low, medium, high and very high. If the risk score is >40, then it is a high impact risk, and mitigation plans and Operational Control Procedures (OCPs) are developed. The organization establishes OH&S objectives, processes and resources required to deliver results per the organization's OH&S Policy and to mitigate these risks, provided they also meet the statutory and regulatory requirements.

A HIRA (Hazard Identification and Risk Assessment) document is created, which is a risk assessment document that can be used to assess and record which hazards pose the most significant risk in terms of probability of their occurrence and how significant their potential impact may be.

Emergency Preparedness and Response Planning

The organization has established and maintained a set of procedures that are needed to follow in case of potential emergencies, as identified in the planning phase. This includes the provision of first aid kit; training for planned responses; periodic tests and exercise of planned

response capability; evaluating performance and making necessary changes in planned responses. After the occurrence of emergencies; the organization communicates and provides relevant information to all workers, contractors, government authorities on their duties and responsibilities.

The types of emergencies included are fire, explosion, toxic releases, injuries and rescues in the hazardous events. This plan improves local, district, state and national capacity of companies to res-pond to disasters and public health emergencies, scaling up the actions with vulnerable communities in health promotion, disease prevention and disaster risk reduction.

Level 6 document in BEL calls for Emergency Preparedness and Response Plan (EPRP). Such a plan gives the guidelines for employees, contractors, transporters and visitors etc. The EPRP not only defines the responsibilities but also informs about prompt rescue/ evacuation/coordination operations and some more.

Three significant roles during EPRP are :

1. Controlling Officer (nominated by top management) who is responsible for taking appropriate decisions during the emergency and takes the ultimate control of the situation. His duties are to :

a. Assess the magnitude of the incident and decide if staff needs to be evacuated from their assembly points to identified safer areas.

b. Implement direct operational control over the areas other than the affected ones.

c. Communicate with senior officials of police, fire brigade, medical and factories inspectorate to provide information about possible effects of the incident on areas outside the factory premises.

d. Look after rehabilitation of affected persons after the discontinuation of emergency.

2. Incident Controller, who has to visit the incident site and evaluate the situation and suggest appropriate measures to deal with the emergency and then reports to the factory manager. His duties will be to :

a. Stop all operations in affected areas and make sure that safety of personnel is top priority, followed by minimum damage to the plant, property and environment and minimize loss of materials.

b. Ensure that non-essential workers/ staff at the areas affected are evacuated to the appropriate assembly point, and the areas are searched for casualties.

c. Set up communication points to establish contact with the Emergency Control Centre (ECC) in the case of electricity and communication failure.

d. Report on all significant developments at the scene to the communication officer, and

e. Preserve the evidence in case for future inquiries for cause and circumstances that caused the emergency.

3. Communication Officer and Coordinating Agencies : Coordinating Agencies are responsible for the management of workers at the safe refuge point. The Communication Officer who also works as a liaison officer and is stationed at the main entrance during the emergency. He is responsible for handling the police, media and other enquiries. He maintains a regular communication with the Incident Controller. He will :

a. Ensure that casualties receive adequate attention or arrange for additional help if required and inform their relatives;

b. In case of a prolonged emergency, arrange for the relief of employees and organize refreshments/food.

c. Ensure availability of alternative transport in case the need arises and control traffic movements into and out of the factory; and

d. Maintain a log of the emergency/ incident on tape for official record.

Mock drills on emergency planning are being conducted periodically, which involves the following teams :

- Task Force and repair team.
- Firefighting team.
- Security Team.
- Transport Team.
- First aid and medical team.

As soon as an emergency is reported, security blows the emergency siren (at a higher noise level), the workers are supposed to assemble at a dedicated place called the assembly area. In that area, the positions are marked according to the divisions and the workers have to report to their designated divisions.

During the time of an emergency, nobody can go inside or come outside the factory. The headcount of the workers is taken and matched with the morning attendance. If suppose any health hazard has taken place during the emergency, the first aid team and the ambulance (present on campus) are ready.

The sequences of events are always recorded for improving the mock drill exercise of the future while the high officials of the organization monitor the planning.

BEL maintains documented information in regard to all aspects of emergency planning, training, testing, performance and reviews.

Assessment of Opportunities for the OHSM System

OH&S opportunity is defined as a circumstance or set of circumstances that can lead to improvement and enhancement of OH&S performance while taking into account planned changes to the organization, its policies, its processes or its activities. The organization implements opportunities to adapt work, work organization and work environment to workers; to eliminate potential hazards and reduce OH&S risks and other opportunities for improving the OHSM system.

Determination of Legal Requirements and Other Requirements

The organization not only determines health and safety requirements but also other legal requirements such as building, environmental etc. The organization maintains processes to determine and have access to up-to-date legal and other requirements that are applicable to its hazards, OH&S risks and OHSM system; determine what needs to be communicated and take these requirements into account when establishing, implementing, maintaining and continually improving its OHSM system. The organization maintains and retains documented information on its legal requirements and other requirements and ensures that it is updated to reflect new changes.

Planning Action

The organization plans actions to :

1. address the risks and opportunities identified;
2. address legal requirements and other requirements;
3. prepare for and respond to emergencies

OH&S Objectives

An OH&S objective is defined as the 'result to be achieved set by a person or group of people, to achieve results consistent with the OH&S policy of the organization and directs the organization to prevent adverse effect on the physical, cognitive or mental condition of the workers performing work-related activities in the organization and to provide a safe workplace for the workers of the organization.' Objectives are meticulously monitored by

dedicated officials, communicated to all the workers and interested parties and are updated as appropriate.

Once OH&S objectives have been decided by the organization's top management, they will need to be planned and documented, and this should also identify the method to be used to evaluate results. OH&S objectives can be strategic, tactical or operational, and their measurement can be qualitative or quantitative.

Do Phase

The "Do" phase of IS0-4500 deals mainly with organization and implementation. After risks and hazards at the workplace are identified, they are organized for proper implementation. Implementation includes instructing, supervising and training the employees for following the procedures to ensure everyone competently carries out their work. Along with it, it also includes the usage of the correct equipment and their maintenance. The documents and reports must also be revised and checked regularly. In particular, this phase aims to involve workers participation and communication between the organization and the workers.

Operational Planning and Control

In Operational Planning and Control, initially, BEL identifies the requirements of products and services. Then standards for processes are made in accordance with the requirements and simultaneously, adoption of specific criteria that will be followed for accepting the product is done. BEL must know the resources that will be required for product formation. Then, it checks that the processes are implemented properly. Lastly, a record is to be made for the processes whether they are followed properly or not, and it should also include information about the product.

Management of Change

Introducing change to products, services, resources, and processes introduces new risks, the established control measures are no longer sufficient to mitigate the hazards effectively. The organization has established a process for planning, managing and controlling planned temporary and permanent changes that impact OH&S performance. Changes are not only related to tangible products such as machinery, materials, new equipment, work conditions technology, facilities, etc. but also less discernible items such as work procedures and instructions, new working practices, legislation, industry guidance, best practices, training, etc. The organization, firstly, reviews the HIRA document or otherwise reviews it after every 2 years, makes the necessary and appropriate changes and action plan to

deal with the new risks. Due diligence needs to be taken to ensure changes do not introduce unintended or unforeseen hazards. The organization reviews the consequences of unintended risks generated due to changes, taking action to mitigate any adverse effects, as necessary.

Hazard Elimination and Reduction of OH&S Risks in BEL

BEL identifies the risks and hazards associated with the equipment and production of products. Based on this, it identifies processes in such a way that the hazards and risks at the workplace are minimized. The first plan of action is the elimination of the hazard and thus, all the risks associated with it. If elimination is not feasible or possible, the organization follows a substitution strategy wherein they try to replace more harmful hazards with less one. Some physical barriers are also used as engineering controls to ensure safety from hazards. In case all the strategies fail, then Personal Protective Equipment (PPE) kits are provided to the workers to ensure their safety. PPE examples; Hand gloves, coveralls, respirators, safety glasses, high-visibility clothing and safety footwear, etc.

Workers Participation is Ensured in BEL

Various levels of organizations have been built up in BEL so that the workers can participate, or they can communicate their worries or issues. This is done through 4 levels of the organization :

1. **Apex Team –** This team meets once in a year where all the Heads, General Managers, management representations of each department and divisions meet to discuss the agenda points and address major OH&S concerns of the workers.

2. **Core Team –** It includes representatives from every department. It is a team of around 50 members. They work with the agenda points and deal with all the issues related to the health and safety of the workers in their departments and provide a forum to solve the significant issues faced by the workers. Their meetings are organized after every two months.

3. **Divisional Team –** This team conducts the meetings quarterly. Workers are supposed to put up their issues, complaints and concerns with the Division Manager. The divisional team addresses these concerns on the divisional level.

   If the issue/complaint of the worker is not solved, then it is brought to the notice of the core team and then the Apex team, in case it is not absolved by the core team as well.

4. **Register of Regulation (RoR) –** RoR is responsible for managing and keeping track of your regulation documents to avoid hindrances and comply with regulatory authorities. There are 27 regulations which are applicable to any industry. Thirteen of these regulations are applicable to BEL. RoR reviews the implementation of the regulations. The measures and objectives are prepared, monitored, reviewed and improved.

Check Phase

In the "Check" phase of ISO 45001, the organization monitors, measures and evaluates the OH&S performance of the established objectives and measures and determines the effectiveness of the OHSM system. Also, the causes of accidents, incidents or near misses are investigated and properly documented.

Monitoring, Measurement Analysis and Performance Evaluation

Methods of monitoring, measurement and analysis are monitored to ensure valid results.

BEL also identifies monitoring and measurement schedules, when the results from the same will be analyzed, evaluated and communicated.

OH&S Improvement

BEL reviews and improves its HSE (Health Safety Environment) policies by :

Internal Audit : BEL does the following as part of the internal audit programme :

1. Establishes, plans and implement programmes and maintains the frequency, methods, responsibilities, planning requirements and reports.
2. Audit criteria is defined according to the domain where it will be conducted.
3. Then auditors are selected such that objectivity and impartiality of the audit process are maximized.
4. After the completion of the audit programme, results are reported to workers or their representatives and other concerned parties.
5. Then action is taken to address non-conformities to improve OH&S performance continuously.
6. As usual, documented information is retained as evidence of implementation of the audit programme and its results.

Internal audit is conducted on 42 locations, where trained auditors visit with

a checklist. Areas, processes, possible hazards and the results are checked. Whenever non-conformities are observed, the auditors document this on the audit report, and this issue is reported to the company. Based on the nature of the non-conformity, the auditor provides containment action, through root cause analysis, and then suggests corrective measures/actions be done.

External Audit : External audits are done yearly to review the processes and make sure they follow proper standards. Wherever a gap is found between the standard process requirements and the existing processes, they raise non-conformity issues and then corrective measure is suggested and implemented so that processes are improved.

1. By continually monitoring, reviewing and improving OH&S objectives.
2. Recommendation of the safety committee and safety audits.

Act Phase

In the "Act" phase of ISO 45001, actions are taken to continually improve to include findings of incidents, addressing non-conformance, audit findings and inspection reports.

Incident, Non-conformity and Corrective Action

The organization has established and maintained a process, for reporting, investigating and taking action, to determine and manage incidents and non-conformities.

When an incident or a non-conformity occurs, the organization :

1. Takes action to control and deal with the consequences
2. Evaluates it by investigating and determining the cause of the incident or non-conformity
3. Determines and implements any action needed
4. Assesses OH&S risks that relate to new or changed hazards before taking action
5. Reviews the effectiveness of any action taken, including corrective action
6. Retains documented information as evidence of the nature of the incident or nonconformities and any subsequent actions taken, along with the results of the actions and corrective actions taken, including their effectiveness.

Forums for Improvement in BEL

BEL has four gateways, where the stakeholders can raise their concerns or issues to improve the existing OH&M policy :

1. **Customers –** They can raise the issue through product support. Recently, BEL has set up a Customer Coordination Cell. The customers of BEL comprise members of the Army, Navy, Air Force, paramilitary, Coast Guard (India, Seychelles, Maldives, Sri Lanka), Police, Doordarshan, All India Radio, Department of Telecommunications and consumers of professional electronic components. They are allowed to register their complaints with the customer coordination cell.
2. **Vendor –** If the vendor finds that the product is not safe. They can raise their issues through sub-contract division/product support.
3. **Government of India –** GoI can change, upgrade or recommend new practices or issues through HR.
4. **Society –** Nearby society or areas surrounding the company, have a forum raise on any health hazard or unsafe practices.

Other Certification/Standards Followed in BEL

Along with ISO 45001, BEL follows multiple other certifications to ensure environmental safety, quality management, information security management, etc.

- **ISO 14001:2015 :** It helps the organization to improve their environmental performance by using resources efficiently and reducing creation of waste, gaining a competitive advantage over other companies as well as the trust of shareholders.[6]
- The AS9100 Revision D standard is a set of guidelines for implementing a High-Quality Management System to be used by aviation, space, and defence organizations (often noted as the aerospace industry).[7]
- ISO 9001: 2015 is an ISO standard that states the requirements for a quality management system (QMS).[8]
- ISO 27001:2013 was developed to help all types and sizes of organizations to protect their information systematically and cost-effectively, through the adoption of ISMS, which is Information Security Management System.[9]
- ISO/IEC 17021, published in 2015, is a standard that was developed for assessing the competence of certification bodies and to ensure that they conform to all types of management systems. These organizations are usually known as Certification Bodies (CBs) or registrars.[10]

- CMMI Level 3 : Capability Maturity Model Integration or commonly known as CMMI, is a process improvement model that helps the organizations to follow the best practices. The model can be used as a guideline for process improvement on any project or a department or even the entire organization. CMMI Level 3 is one of the five "Maturity Levels", also known as the "Defined" level. The CMMI Level 3 is successfully achieved when the organization completes a SCAMPI A appraisal, which substantiates that the organization is operating at Level 3. This means that an organization's engineering processes are defined for process areas such as Decision Analysis and Resolution, Integrated Project Management, Organizational Process Definition, Organizational Training, etc.[11]

Cost Incurred to Implement ISO 45001

A rough estimate of the amount spent on properly and effectively implementing ISO 45001 in BEL is about ₹15-20 lakhs. This implementation cost includes the cost of training selected employees for the role of the lead auditor. Courses for training cost around ₹30,000 per candidate and around 12 employees are trained for this skill, totaling to around ₹3.6 lakhs. Along with this, employees are trained and educated about all the aspects of the standard. Internal cost includes the time and effort the employees of BEL spend to build and implement the system according to the needs and specifications of the organization. A major portion of the total amount is spent on creating and maintaining documents and publishing various manuals and documentation and creating audit reports. There are some other variable costs such as duration of audits, hidden costs (travel time, application fees and annual management fees) and cost of external audits.

Waste Disposal in BEL

Proper and careful disposal of waste is also necessary to ensure the safety of workers. The waste is split into four categories, namely hazardous waste, E-waste, biomedical waste, and solid waste.

- The manufacturing processes generate seven types of hazardous waste. The principle of reduction, re-use, and recycling is observed when handling hazardous waste. Different ways are used to dispose of different types of hazardous waste. A protected site is allotted for safe storage of these waste before their treatment. BEL has to take a license approval from the GOI or the UP Pollution Control Board for disposal of these hazardous wastes.

- For other waste, a dedicated area is present for their disposal called Salvage areas where used batteries/ paint boxes, used oil drums are disposed of.
- E-waste such as computers, CPUs, peripherals, printers, scanners, printed circuit boards, laptops, etc., are recycled in an environmentally conscious way to recover the raw materials.
- Other wastes generated during the manufacturing of products are separated at source and are handed over to Pollution Control Board authorized agencies for scientific processing, recovery, and recycling as a manufacturer.
- Biomedical wastes generated in the BEL dispensary and medical centres are collected and disposed of scientifically as per regulatory guidelines.

Future Goals

BEL aims to execute ISO 45001 and ISO 14001 more effectively to protect the health and safety of its workers and protect the environment as well. In future BEL plans to implement ISO 50001 which is a company level certification based on a standard published by the ISO. Its purpose is to use energy more efficiently by implementing an energy management system. The standard is based on a continuous improvement management system model. The certification requires the company to develop an energy policy, establish goals to meet the policy, utilize data to meet goals, measure policy effectiveness, and continually make improvements to the policy.[12]

Conclusion

Through this case study, we can realize the importance of a strong and effective OHSM system in the organization, along with the proper implementation of standards and certifications to protect and safeguard workers. A properly implemented OHSM system means establishing operational controls procedures to manage OH&S risks and hazards, emergency plans, a mechanism for accessing incidents and improving processes through monitoring and reviewing continuously. It contributes to the minimization and reduction of risks. It involves increasing awareness about the measures adopted by the organization, amongst workers through worker's consultation and participation, in compliance with applicable legal and other requirements.

BEL has been successfully implementing ISO 45001:2015 to ensure the safety and health of its workers. Along with this, it implements other standards and certification like ISO 9001:2015, ISO 14001:2015 etc. and in future aims to implement ISO 50001 for establishing

an effective energy management system. Every standard/certification contributes in its own way to protect the health and ensure safety of the workers. Investments in the safety and health of workers and the working environment contribute to reducing business cost in the long run, through fewer absences due to sickness, cutting healthcare costs, encouraging the workforce, in general, to remain active. It positively contributes to increased productivity of the employees and enhances employees' commitment to the organization as a whole, thus building a stronger organization. By demonstrating that the organization addresses its safety and health obligations, the company can protect and enhance its credibility and reputation. This shows the customers that the business is committed to working within a set of safety and health principles., thus giving more confidence to the potential clients and customers to start or continue cooperation with the company, which leads to increased business competitiveness and building the brand. Therefore, the financial benefits of ISO certification and strong OH&S policy of the organization almost always outweigh the upfront costs.

References

1. https://en.wikipedia.org/wiki/Worker_safety_and_health
2. https://en.wikipedia.org/wiki/Bharat_Electronics
3. https://oem.bmj.com/content/61/2/180
4. https://www.osha.gov/sites/default/files/2018-12/fy07_sh-16615-07_train-the-trainer_manual2.pdf
5. BS ISO 45001:2018 -Occupational health and safety management systems Requirements with guidance for use, BSI Standards Publication
6. https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100372.pdf
7. https://advisera.com/9100academy/what-is-as9100/
8. https://asq.org/quality-resources/iso-9001#:~:text=ISO% 209001%20is%20defined%20as,meet%20customer%20and%20regulatory%20 requirements.
9. https://advisera.com/27001academy/what-is-iso-27001/
10. https://the9000store.com/articles/what-is-iso-iec-17021/
11. https://cmmiinstitute.com/learning/appraisals/levels
12. https://certifications.thomasnet.com/certifications/glossary/quality-certifications/iso/iso-50001/

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Economic& Business Dailies	Author	Surname, Initials (year) Title of the Paper, Newspaper's Name, Month, Day .
Business Magazines	Author	Surname, Initials (year), Title of the Paper, Business Magazine's name Volume Number : Issue Number.

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