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Dear Reader,

Greetings from Acharya Bangalore B School, Bengaluru, Karnataka. I am happy to present the Volume 8, Issue 1 of AMBER. The theme of this issue is 'Financial Derivatives Market in India'.

AMBER- ABBS Management Business and Entrepreneurship Review (ISSN 0976-3341) is a peer-reviewed journal that provides a platform to researchers, academicians, professionals and students in Management to share research achievements, their perspectives and practical experiences. We are also happy that we have done our bit in creating knowledge and disseminating the same.

Derivatives are financial instruments whose payoffs derive from other, more primitive financial variables such as stock, commodities, index level, interest rate or an exchange rate. The world market for derivatives is enormous and accelerating. The notion amount outstanding in the over-the-counter (OTC) derivatives market worldwide exceeds \$640 trillion. The growth of derivatives usage over the last two decades has been rapid in both advanced economies and emerging markets; in both OTC contracts and those that are exchange-traded; and across all underlying classes, including interest-rate, currency, equity, and the most recent addition, credit. Derivatives are enormously useful instruments in the management of risk. They can be used to hedge an existing market exposure (forwards and futures), to obtain downside protection to an exposure even while retaining upside potential (options), to transform the nature of an exposure (swaps) and to obtain insurance against events such as default (credit derivatives).

India's derivatives markets, both OTC and exchange-traded, have seen rapid growth over the last decade with relatively few sputters. The success is visible and real - several Indian exchanges rank among the world's top exchanges in terms of number of derivatives contracts traded; and there have been no large scale derivatives disasters of the sort that have rolled the advanced economies. This issue peels away the layers and discusses the role of derivatives in Indian financial markets and their development.

In the spirit of continuous improvement, constructive input on streamlining our processes is welcome. I generously thank the contributors of this volume and the management of Acharya Bangalore B School, for helping us to come up with another great issue of AMBER. Last, but not the least; I thank this issue editor Ms. Heena Kosar.

Dr. H.R. Venkatesha
Chief Editor

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Capital Inflows and Silver Standard in India

1

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Abstract

In this paper author tries to relate gold and silver inflows with GDP, GDP per capita, export, import and gold silver price ratio in India during silver standard regime from 1851 to 1893. Author used semi-log, double-log regression models, Johansen co-integration and VAR models (1991,1996) and Bai-Perron model (2003) for structural change taking data from Maddison(2006) and Ambedkar(1923). The paper concludes that gold inflows during 1851-1893 had decreased at the rate of 0.34% per year insignificantly but it was nonstationary, convergent and had no structural breaks. Silver inflows during 1851-1893 had increased at the rate of 1.51% per year insignificantly and found nonstationary and convergent and had one upward structural break in 1857. No co-integration among gold or silver inflows with GDP, GDP per capita, export, import and gold silver price ratio was found during 1851-1893 where VAR model was unstable and non-stationary and impulse response functions were diverging. Semi-log linear regression model among silver inflows and gold inflows with those variables were also insignificant although GDP, export, import and gold silver price ratio had been increasing at the rates of 0.52%, 9.14%, 5.16% and 0.77% per year significantly. But double-log linear regression model suggested that gold inflows had significant impact from GDP, GDP per capita, export, and gold-silver price ratio but had no significant impact of silver inflows from those variables during 1851-1893 respectively. Yet, there is bidirectional causality

among gold inflows, GDP, GDP per capita, export, import and gold silver price ratio significantly during the given period. Even, there were sharp depreciation of rupee sterling rate, falling silver price, silver production and rising gold price and gold production during the silver standard regime. Thus, gold and silver inflows could not synthesize the silver standard more effective in macro-dynamic adjustment during 1851-1893 although the series of managerial experiments of the commissions and government are equally responsible for instability of the silver standard in India which was equally identical with gold standard in England

Key words-Net gold inflows, net silver inflows, silver standard, GDP, export, import, co-integration, VAR

JEL-E42, F33, N10, N20

I. Introduction

Silver standard in India was introduced in 1835 but the Act of XVII and the Act of XXI in 1835 declared both silver coin and copper coins as legal tender, on the other hand, gold coin was not legal tender yet it was circulated. Later on, in 1861 by Act of XIX, gold coin was treated as legal tender. In 1861, the paper currency notes were circulated. The gold: silver was 1:15.5 and rupee sterling rate was fixed at 1s10.5d where exchanges were governed by relative values of gold and silver.

During long 400 years from 1493 to 1893, gold and silver production were more or less uniform but during 1600-1700, index of gold rose from

130 to 176, which rose to 270 during 1700-1800. In 1870, the index of gold production stipulated to 2124 as compared to 450 for silver. Even the rupee sterling rate depreciated and price of gold silver ratio appreciated to a larger extent. India was one of the chief producers of the silver and gold but it was the net importer of both gold and silver which were volatile. Although silver standard during 1873-1893 in India was as like as gold standard in England during 1873-1893, yet British government introduced several policies of mints, currency circulation as well as bimetallism as an experimental basis which made the silver standard unstable. During this period, most of the countries in the world started to introduce gold standard including British colonies. In India, gold supplies and its prices were stipulating compared to silver, but British Government denied to introduce gold standard in spite of numerous positive signals of implementing gold standard given by many commissions. In 1893, England declared gold exchange standard in India where gold was not convertible to rupee but rupee was convertible to sterling which was fixed parity with gold. Therefore, success story of silver standard is little yet there is no vital disturbance in working the system of silver standard in India.

II. Objective of the paper

In this paper author endeavors to analyze the working of capital inflows in the silver standard in India and its relation with the GDP, GDP per capita and on international trade and even on the gold silver price ratio during 1851-1893. The net gold import and net silver import were considered as capital flows for the specified period.

III. Methodology and data

Net gold import and net silver import were treated as capital flows in India during 1851-1893. The trend lines of gold inflows, silver inflows, export, import, GDP, GDP per capita, ratio of gold and silver price were calculated by semi-log linear

model. Stationarity was observed through ARIMA model, structural change was shown by Bai-Perron model (2003). Double-log multiple regression model was used for showing relationship among those variables with gold and silver inflows for the specified period. Since there is no co-integration with gold inflows and other variables and silver inflows with other variables, author used Johansen VAR model (1991, 1996) for showing relationship analyzing residual tests and impulse response functions. Even, Granger (1969) model was tested for causality. Data for GDP and per capita GDP were collected from Maddison (2006) and data for all other variables were taken from B.R. Ambedkar (1923). Assume, $x_1 = \text{GDP}$, $x_2 = \text{GDP per capita}$, $x_3 = \text{export}$, $x_4 = \text{import}$, $x_5 = \text{gold silver price ratio}$, $y_1 = \text{net gold import}$, $y_2 = \text{net silver import}$

IV. Literature Review

Davis and Gallman (2001) analyzed that real GDP and per capita GDP growth had fallen from 1861-1889 to 1889-1904 in Australia due to declining contribution of gold and silver. Bordo and Meissner (2007) verified that capital flows increases growth rate in most of the countries during 1880-1913. Bai and Kung (2016) explained through ARDL approach that a decrease in global supply of precious metal had together culminated in the outflow of silver from China depressing inflation, depreciating value of copper relative to silver diminishes standard of living. Gonzalez, Galvarriato and Williamson (2008) verified that Mexican GDP doubled due to increasing international trade, silver export, and increase in textiles during 1796-1872. Gault (2014) showed using world bank monthly data from 1970 to 2011 that world trade rose due to rise in gold but gold price did not relate with GDP growth. In international monetary system, gold is a proxy for some macro parameters. Bordo (1981) showed that gold flows in USA led to increase in money supply which induced to rise inflation rate and increased

imports and external deficit where he verified that coefficient of variation of per capita income in USA and UK increased from 3.5% and 2.5% during 1870-1913 to 5.5% and 4.9% during 1919-1938 which again fell to 1.6% and 1.4% during 1946-1979 respectively as a result of gold inflows. SRSrocco report(2015) asserted that during 1970-1990, price of oil increased 16 times its 1971 level, silver shot up 16 times and gold jumped 15 times after collapse of gold dollar convertibility and the same was happened during 2000-2012. Expert opinion said that it was due to a fundamental change in energy market not a change in bull market. World gold council(2010) showed that gold price development do not resembles past bubble including US housing price, NASDAQ, Nikkei equity market bubble. Gold price is consistent with long range average assets including oil. Gold demand becomes robust due to emerging markets, shift of behavior of central banks, recovery and new advance in industrial demand for gold. O'Connor et al(2015) showed some important findings. Over 15 years in UK and USA, real interest rate decreased as a result of increase in real price of gold. In USA during 1985-2015, there was no co-integration between gold and CPI but during 1973-1983, gold price is positively related with US inflation which was true also during 1945-1983. In Euro Area during 1969-2011, gold is found to be a partial hedge for inflation. It was learnt from a PhD student of Japan that Japan was in silver standard before 1897. During 1885-1897, silver fell down and depreciation of silver led to increase in export and increase in GDP and GDP per capita. A 3.5% increase in export led to one percent increase in GDP was seen.

V. Some observations of the model

During the silver standard regime in India from 1851 to 1893, net gold inflows had been decreasing at the 0.34 per cent per year which was insignificant.

$$\text{Log}(y_1) = 14.770 - 0.003433t$$

$$(58.54) * (-0.34)$$

$R^2 = 0.0028, F = 0.118, DW = 0.46, \gamma^2 =$ net gold inflows (imports), * = significant at 5% level. $t = \text{year}$

Net gold inflow from 1851 to 1893 is convergent but nonstationary because its AR(1) is convergent and stationary but its MA(1) is convergent and nonstationary.

$$\text{Log}(y_{1t}) = 14.63648 + 0.7232 \text{log}(y_{1t-1}) + \epsilon_t + 0.083569 \epsilon_{t-1} + 0.26009 \sigma^2$$

$$(40.19) * (3.46) * \quad (0.24) \quad (6.76) *$$

$R^2 = 0.58, F = 18.57, DW = 1.97$, inverted AR root = 0.72, inverted MA root = -0.08, * = significant at 5% level.

This series has no structural breaks during the period.

On the other hand, net inflow of silver in India during silver standard from 1851 to 1893 had been stipulating at the rate of 1.51% per year which was insignificant.

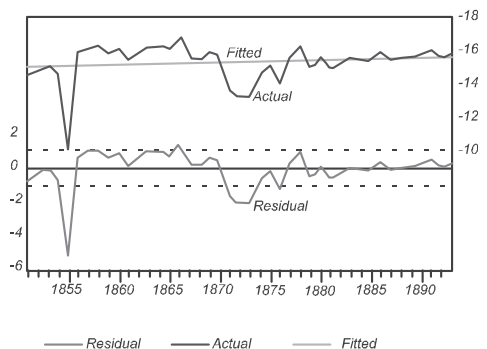
$$\text{Log}(y_2) = 15.034 + 0.015138t$$

$$(43.84) * (1.115)$$

$R^2 = 0.029, F = 1.24, DW = 1.36, \gamma_2 =$ net inflow of silver, * = significant at 5%.

In Fig-1, the upward fitted line is shown clearly.

Fig-1: Trend line of silver inflows



The net inflow of silver in India during 1851-1893 is non-stationary but convergent which is shown by ARIMA (1, 1, 1) model. It is not a good fit yet it is stable.

$$\text{Log}(y_{2t})=15.363+0.48873\text{log}(y_{2t-1})+\varepsilon_t-0.183616\varepsilon_{t-1}+1.0639\sigma^2$$

(35.71)* (0.96) (-0.34) (7.32)*

$R^2=0.11$, $F=1.64$, $DW=1.96$, inverted AR root=0.49, inverted MA root=0.18 ,*=significant at 5% level.

Net inflow of silver has one upward structural breaks in 1857 only.This is verified by Bai-Perron test(2003)in which HAC standard errors and covariance was assumed and trimming 0.15 with maximum 5 beaks is assumed.

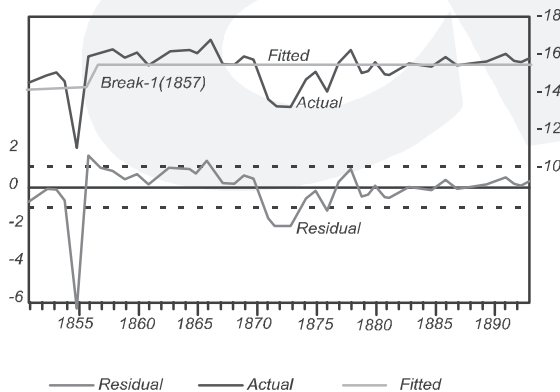
Table-1: Structural breaks of net inflow of silver

variables	coefficient	Standard error	T statistic	Probability
	1851-1856=6obs			
c	14.2328	0.3368	42.25	0.00
	1857-1893=37 obs			
c	15.537	0.218	71.30	0.00

$R^2=0.17$, $F=8.64^*$, $DW=1.62$;Source-Computed by author

In Fig-2,the upward structural break in 1857 is shown clearly.

Fig-2:Structural break



Source-Computed by author

Double log multivariate regression model showed that one per cent increase in GDP,GDP per capita,export,import,gold silver price ratio and net silver inflow led to 12.68% decrease ,19.27% increase,1.89% increase ,1.47% increase,9.93% decrease and 0.13% increase in net inflows of gold per year respectively where relation between gold inflows and GDP,GDP per capita, export, goldsilver price ratio are significant at 5% level.

$$\text{Log}(y_1) = -19.359 - 12.683\text{log}(x_1) + 19.275\text{log}(x_2) + 1.89\text{log}(x_3) + 1.47\text{log}(x_4) - 9.938\text{log}(x_5) + 0.1319\text{log}(y_2)$$

$$(-0.56) \quad (-1.99)^* \quad (2.86)^* \quad (2.54)^* \quad (1.53) \quad (-3.35)^* \quad (1.35)$$

$R^2 = 0.48$, $F = 5.67^*$, $DW = 1.24$, where $x_1 = \text{GDP}$, $x_2 = \text{GDP per capita}$, $x_3 = \text{export}$, $x_4 = \text{import}$, $x_5 = \text{gold silver price ratio}$, $y_2 = \text{net inflows of silver}$, $*$ = significant at 5% level

Similarly, one per cent increase in GDP, GDP per capita, export, import, gold silver price ratio and net gold inflow per year led to 11.11% fall, 12.13% rise, 1.86% increase, 0.045% rise, 1.47% increase and 0.37% increase in net silver inflows in India per year during 1851-1893 in silver standard regime which are all insignificant.

$$\text{Log}(y_2) = 2.739 - 11.1162\text{log}(x_1) + 12.139\text{log}(x_2) + 1.86\text{log}(x_3) - 0.045\text{log}(x_4) + 1.47\text{log}(x_5) + 0.37\text{log}(y_1)$$

$$(0.047) \quad (-1.10) \quad (0.98) \quad (1.416) \quad (-0.027) \quad (0.25) \quad (1.35)$$

$$R^2 = 0.24, F = 1.89, DW = 1.59,$$

To show linear combination of silver inflows with other variables, Johansen Co-integration test suggests that there are no co-integrating vectors shown by Trace and Max Eigen Statistic (Table-2).

Table-2: Co-integration test

Hypothesized no. of CEs	Eigen value	Trace statistic	0.05 CV	Probability*
None	0.524	113.692	125.615	0.211
At most 1	0.445	83.189	95.753	0.266
At most 2	0.412	58.993	69.818	0.267
At most 3	0.299	37.219	47.856	0.337
At most 4	0.245	22.630	29.797	0.264
At most 5	0.236	11.095	15.494	0.205
At most 6	0.0006	0.026	3.841	0.87
Hypothesized no of CEs	Eigen value	Max Eigen statistic	0.05 CV	Probability*
None	0.524	30.502	46.231	0.75
At most 1	0.445	24.196	40.077	0.825
At most 2	0.412	21.774	33.876	0.625
At most 3	0.299	14.588	27.584	0.779
At most 4	0.245	11.534	21.131	0.593
At most 5	0.236	11.068	14.264	0.150
At most 6	0.0006	0.0266	3.841	0.870

* = Mackinnon-Haug-Michelis (1999) p values

Since there is no co-integration ,The estimated VAR model is given below.

$$\Delta x_{1t} = 8451.51 + 0.212\Delta x_{1t-1} - 2.161\Delta x_{2t-1} + 3.10E-06\Delta x_{3t-1} + 1.53E-05\Delta x_{4t-1} + 174.27\Delta x_{5t-1} - 9.07E-06\Delta y_{1t-1} + 7.32E-06\Delta y_{2t-1}$$

$$(3.6)^* \quad (1.02) \quad (-0.54) \quad (0.32) \quad (1.27) \quad (1.45) \quad (-0.22) \quad (0.51)$$

$$R^2 = 0.92, F = 56.29, AIC = 14.47, SC = 14.80$$

$$\Delta x_{2t} = 313.711 - 0.025\Delta x_{1t-1} + 0.796\Delta x_{2t-1} + 1.20E-07\Delta x_{3t-1} + 3.32E-07\Delta x_{4t-1} + 7.67\Delta x_{5t-1} - 8.67E-07\Delta y_{1t-1} + 2.37E-07\Delta y_{2t-1}$$

$$(3.97)^* \quad (-3.53)^* \quad (5.83)^* \quad (0.365) \quad (0.807) \quad (1.86) \quad (-0.86) \quad (0.48)$$

$$R^2 = 0.765, F = 15.81, AIC = 7.72, SC = 8.05$$

$$\Delta x_{3t} = -46481278 + 4953.34\Delta x_{1t-1} - 137563.9\Delta x_{2t-1} + 0.466\Delta x_{3t-1} + 0.068\Delta x_{4t-1} + 4792340\Delta x_{5t-1} + 1.919\Delta y_{1t-1} - 0.355\Delta y_{2t-1}$$

$$(-1.08) \quad (1.27) \quad (-1.84) \quad (2.59)^* \quad (0.305) \quad (2.14)^* \quad (2.57)^* \quad (-1.33)$$

$$R^2 = 0.96, F = 130.0^*, AIC = 3.414, SC = 74.47$$

$$\Delta x_{4t} = -1.11E+08 + 9232.72\Delta x_{1t-1} - 84374.41\Delta x_{2t-1} + 0.084\Delta x_{3t-1} + 0.3377\Delta x_{4t-1} + 3264343\Delta x_{5t-1} + 0.2086\Delta y_{1t-1} - 0.235\Delta y_{2t-1}$$

$$(-3.92)^* \quad (3.61)^* \quad (-1.72) \quad (0.713) \quad (2.29)^* \quad (2.21)^* \quad (0.425) \quad (-1.33)$$

$$R^2 = 0.98, F = 247.81^*, AIC = 33.3, SC = 33.63$$

$$\Delta x_{5t} = 4.0918 - 8.24E-05\Delta x_{1t-1} + 0.00176\Delta x_{2t-1} + 4.27E-09\Delta x_{3t-1} - 2.07E-08\Delta x_{4t-1} + 0.716\Delta x_{5t-1} - 6.34E-08\Delta y_{1t-1} + 1.22E-08\Delta y_{2t-1}$$

$$(1.8) \quad (-0.401) \quad (0.439) \quad (0.45) \quad (1.75) \quad (6.06)^* \quad (-1.73) \quad (0.908)$$

$$R^2 = 0.97, F = 212.09^*, AIC = 0.629, SC = 0.96$$

$$\Delta y_{1t} = 8108862 + 636.61\Delta x_{1t-1} + 4042.18\Delta x_{2t-1} - 0.0215\Delta x_{3t-1} - 0.00204\Delta x_{4t-1} - 76501.53\Delta x_{5t-1} + 0.8244\Delta y_{1t-1} + 0.033\Delta y_{2t-1}$$

$$(-0.81) \quad (0.708) \quad (0.23) \quad (-0.51) \quad (-0.03) \quad (-0.14) \quad (4.78)^* \quad (0.54)$$

$$R^2 = 0.67, F = 10.28, AIC = 31.21, SC = 31.54$$

$$\Delta y_{2t} = 63316662 + 3366.48\Delta x_{1t-1} + 311.52\Delta x_{2t-1} - 0.034\Delta x_{3t-1} - 0.204\Delta x_{4t-1} + 1705435\Delta x_{5t-1} + 1.036\Delta y_{1t-1} + 0.235\Delta y_{2t-1}$$

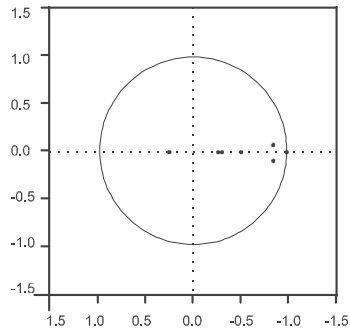
$$(-2.56)^* \quad (0.50) \quad (0.007) \quad (-0.33) \quad (-1.58) \quad (1.3) \quad (2.42)^* \quad (1.53)$$

$$R^2 = 0.42, F = 3.63, AIC = 33.03, SC = 33.36, * = \text{significant at 5\% level}$$

The estimated VAR model states that [i] change of GDP per capita is negatively related with change of previous period's GDP and positively related with previous period's GDP per capita,[ii] change of export is positively related with change of previous period's export,ratio of gold and silver price,change of gold inflows,[iii] change of import is positively related with change of previous period's GDP,import and gold silver price ratio,[iv]change of gold and silver inflows are positively related with their previous period .Other relations are insignificant.

This VAR model is unstable because one of its 7 roots is greater than one ,two roots are imaginary and 4 roots are less than one (,ie 1.012998, 0.853108±0.084339i, 0.527198, 0.307550, 0.272081), so all roots do not lie inside the unit root circle.It is seen in the Fig-3.

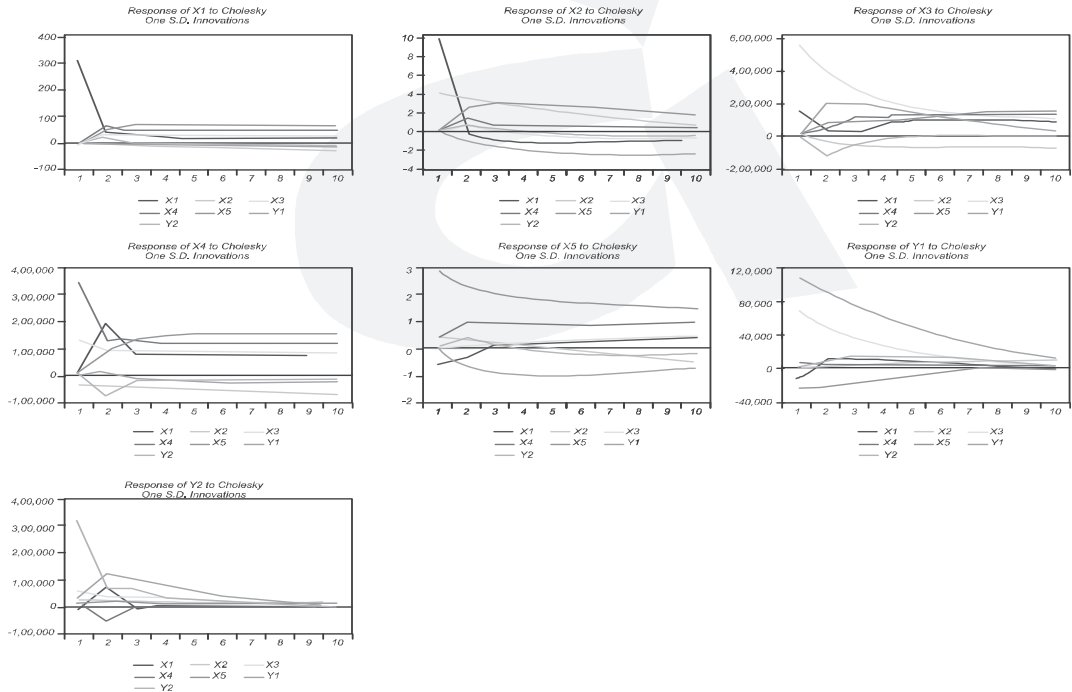
Fig-3:Inverse roots of AR characteristic polynomial



Source-Computed by author

The impulse response functions are diverging so that it is non-stationary and unstable. The exogenous shocks could not tend the model into equilibrium.

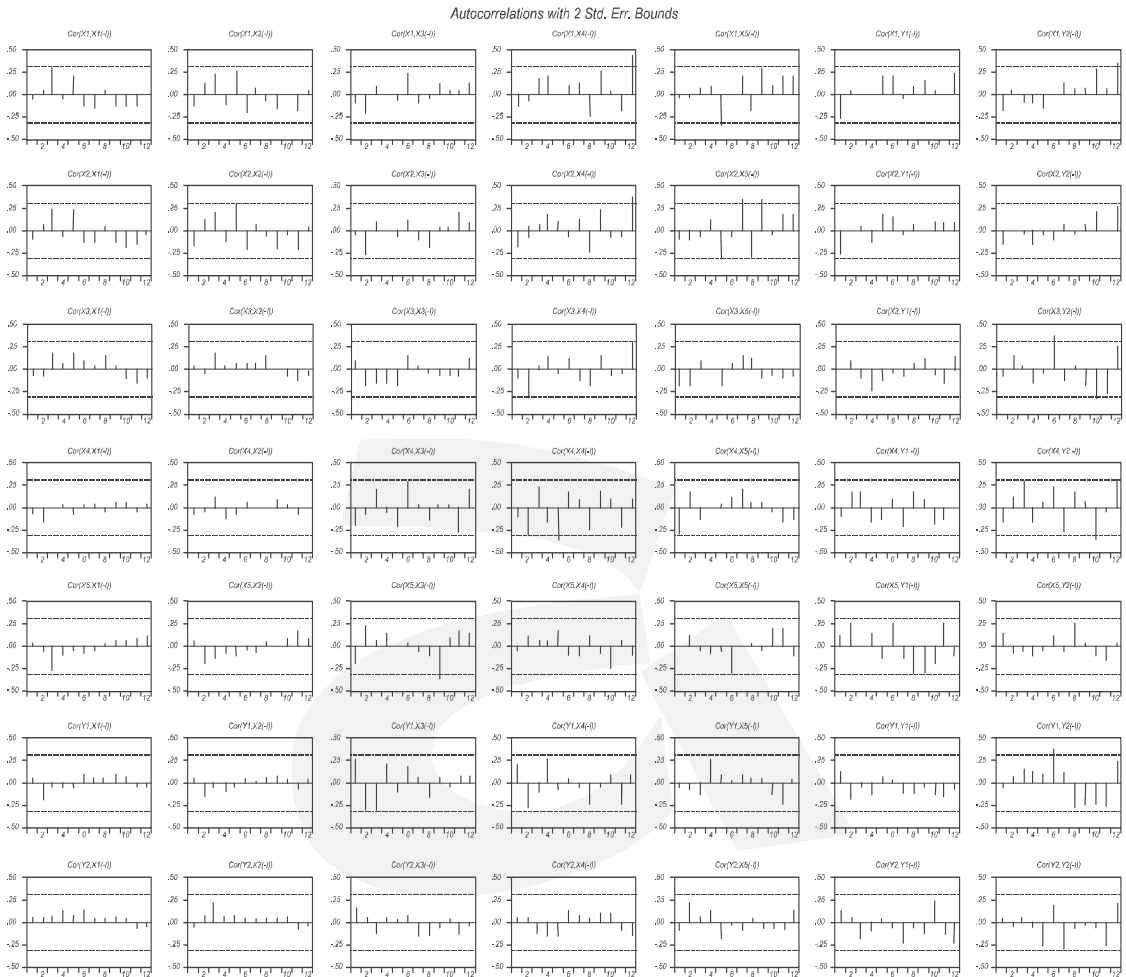
Fig-4:Impulse response functions



Source-Computed by author

The residuals test of VAR model assures that the VAR model has problems of autocorrelations which is seen in the Fig-5.

Fig-5: Problem of autocorrelation



Source-Computed by author

The Doornik-Hansen Normality test showed that some component values of Chi-squares of skewness and kurtosis are insignificant and some components of Jarque Bera are also insignificant, therefore normality test is rejected at 5% level. In Table-3, the values are arranged.

Table-3:Normality test

Component	Skewness	Chi-square	df	Probability
1	-1.02516	7.3394	1	0.0067
2	-0.34504	1.030359	1	0.3101
3	0.000458	1.89E-06	1	0.9989
4	-0.37256	1.194456	1	0.2744
5	0.969224	6.701514	1	0.0096
6	-0.743477	4.278805	1	0.0386
7	0.676342	3.621130	1	0.0571
Joint		24.16574	7	0.000
Component	kurtosis	Chi-square	df	Probability
1	5.462538	1.625122	1	0.2024
2	5.194797	12.01844	1	0.0005
3	4.744478	10.74461	1	0.0010
4	4.830324	8.96958	1	0.0027
5	4.980636	0.854511	1	0.3553
6	3.544591	0.027912	1	0.8673
7	4.384803	2.246676		0.1339
Joint		34.48682	7	0.000
Component	Jarque Bera	df	Probability	
1	8.96495	2	0.0113	
2	13.04880	2	0.0015	
3	10.74461	2	0.0046	
4	10.16400	2	0.0062	
5	7.556024	2	0.0229	
6	4.306717	2	0.1161	
7	5.867806	2	0.0532	
Joint	60.65256	14	0.000	

Source-Computed by author

Granger Causality test showed that there are bi-directional causality among $(x_1, x_2), (x_1, y_1), (x_2, x_3), (x_2, x_4), (x_2, x_5), (y_1, x_2), (x_3, x_5), (y_1, x_3), (y_1, x_4), (y_1, x_5)$ and there are uni-directional causality among $((x_1, x_3), (x_1, x_5), (x_1, x_4), (x_3, x_4), (x_4, x_5))$ respectively which are shown in the Table No-4 below.

Table-4:Causality

Null Hypothesis	Obs	F Statistic	probability
X ₂ does not Granger cause x ₁	42	2.999	0.0912
X ₁ does not Granger cause x ₂		0.01119	0.916
X ₃ does not Granger cause x ₁	42	8.153	0.0069
X ₁ does not Granger cause x ₃		1.657	0.202
X ₄ does not Granger cause x ₁	42	24.318	2E-05
X ₁ does not Granger cause x ₄		17.0419	0.0002
X ₅ does not Granger cause x ₁	42	14.38	0.0005
X ₁ does not Granger cause x ₅		2.02	0.1627
Y ₁ does not Granger cause x ₁	42	0.0136	0.907
X ₁ does not Granger cause y ₁		0.372	0.545
X ₃ does not Granger cause x ₂	42	0.1847	0.6697
X ₂ does not Granger cause x ₃		0.0041	0.9489
X ₄ does not Granger cause x ₂	42	2.199	0.1461
X ₂ does not Granger cause x ₄		2.907	0.1368
X ₅ does not Granger cause x ₂	42	1.539	0.2221
X ₂ does not Granger cause x ₅		1.324	0.2567
Y ₁ does not Granger cause x ₂	42	4.316	0.0444
X ₂ does not Granger cause y ₁		2.0388	0.1613
X ₄ does not Granger cause x ₃	42	3.658	0.0631
X ₃ does not Granger cause x ₄		2.2716	0.1398
X ₅ does not Granger cause x ₃	42	0.1985	0.6584
X ₃ does not Granger cause x ₅		1.0764	0.3059
Y ₁ does not Granger cause x ₃	42	3.1819	0.0822
X ₃ does not Granger cause y ₁		6.402	0.0155
X ₅ does not Granger cause x ₄	42	3.1819	0.0822
X ₄ does not Granger cause x ₅		6.402	0.0155
Y ₁ does not Granger cause x ₄	42	0.4605	0.5014
X ₄ does not Granger cause y ₁		0.9115	0.0.345
Y ₁ does not Granger cause x ₅	42	0.1439	0.7064
X ₅ does not Granger cause y ₁		0.6537	0.4237

Source-computed by author

VI.Limitation and future scope of research

In this paper, the data of GDP and per capita GDP of India have been calculated from 1851-1883 on the basis of constant growth rates which were collected from Maddison(2006) to fit them into long term time series from 1851-1893. If the model is compared to other monetary systems in India or China, then a good comparative study would be achieved. However, there is ample scope for future research in this area of study.

VII.Criticism

The act of 1835 made silver rupee weighing 180 gms or 11/12th fine (containing 165gms of fine silver) in unlimited legal tender including demonetization of gold coins but act of 1841 introduced gold mohurs acceptance in public

treasuries at the rate of 1:15. After 1850 production of silver tended to fall and currency famine intensified Indian economy. In 1861, paper currency Act passed and paper currency began to circulate. In 1874, government declared £1=Rs10.5 and government adopted gold currency which led to fall price of silver from 58 pence to 37.5 pence and to 27 pence in 1899 in which rupee sterling rate declined from 2s (in 1872) to 1s2d in 1892 and India government faced a loss of 154 crores of rupees during 1875-89. In 1892, coinage of silver suspended and introduced £1=Rs15, or Rs1=1s4d, and in 1893 the silver standard was abandoned. In Table- 5, it is shown that gold production rises with its rising price compared to silver including their index numbers during silver standard period from 1851 to 1892 which accelerated to demolish silver standard from India.

Table-5: Silver and gold production and price ratios.

	Ratio of gold production to silver production	Ratio of value of gold and silver	Index no. of production ratio	Index no of value of gold and silver
1851-1855	4.4	15.45	13.8	103.3
1856-1860	4.5	15.28	14.0	102.2
1861-1865	5.9	15.42	18.55	103.1
1866-1870	6.9	15.52	21.7	103.8
1871-1875	11.3	16.10	35.5	107.6
1876-1880	13.2	17.79	41.5	119.0
1881-1885	17.3	18.81	54.4	125.8
1886-1890	19.9	20.98	62.6	140.3
1891-1895	20.0	26.75	62.9	178.9

Source-Ambedkar(1923)

Sir, R. Giffen remarked before the Fowler commission that India has abundant gold supply and in 1868, Sir R. Temple concludes to follow gold as legal tender. From 1870-1876, a fall of silver value prompted Bombay Chamber of Commerce recommended gold standard. Smith committee also proposed to follow gold standard. The spokesmen like Giffen, Mallet,

Farrer, Welby to Herschell committee (1893) were in favour of introduction of gold standard in India.

Viena congress (1859), Barlin congress (1863), Paris conference (1867) proclaimed stability, uniform coinage, gold as the principal currency. In 1871, Germany passed gold standard, in

1872, Norway, Sweden, Denmark went to gold standard, in 1873 Belgium suspended silver standard, in 1879, Austria did the same, in 1873 USA passed gold standard and in 1878 Latin America suspended silver standard. During 1870-93 there was over supply of silver and silver price in terms of gold depreciated. Fisher also opposed to double standard with double coinages. England ultimately dominated world trade and finance in her favour adopting gold standard. But alas! India remains in gold exchange standard from 1893 onwards. Sterling was convertible to gold, rupee was convertible to sterling but rupee was not convertible to gold.

Capital inflows did not favour silver standard during 1851-1893 because one percent increases in gold inflows per year led to 0.65 decrease in GDP, 0.68% decrease in GDP per capita, 9.62% increase in export and 1.75% increase in import per year respectively which are all insignificant. On the other hand, one percent rise in silver inflow per year led to 1.13% increase in GDP, 0.0012% decrease in GDP per capita, 13.45% increase in export and 12.03% increase in import per year respectively all of which are insignificant. Although, GDP, export, import, gold silver price ratio had been increasing at the rates of 0.52%, 9.14%, 5.16% and 0.77% significantly per year respectively during the silver standard from 1851 to 1993. Therefore, instability of the silver standard in macroeconomic fundamentals is clear and the relations among them with capital flows were improper.

B.R. Ambedkar (1923) was dead against these outcomes of the silver standard in which the acts and laws were imposed as experiments during the silver standard by the British government although he fought for gold standard which was not introduced rather gold exchange standard was imposed in India from 1893.

VIII. Conclusion

The paper concludes that gold inflows during 1851-1893 had decreased at the rate of 0.34% per year insignificantly but it was nonstationary, convergent and had no structural breaks. Silver inflows during 1851-1893 had increased at the rate of 1.51% per year insignificantly and found nonstationary and convergent and had one upward structural break in 1857. No co-integration among gold or silver inflows with GDP, GDP per capita, export, import and gold silver price ratio was found during 1851-1893 where VAR model was unstable and non-stationary and impulse response functions were diverging. Semi-log linear regression model among silver inflows and gold inflows with those variables were also insignificant although GDP, export, import and gold silver price ratio had been increasing at the rates of 0.52%, 9.14%, 5.16% and 0.77% per year significantly. But double-log linear regression model suggested that gold inflows had significant impact from GDP, GDP per capita, export, and gold-silver price ratio but had no significant impact of silver inflows from those variables during 1851-1893 respectively. Yet, there is bidirectional causality among gold inflows, GDP, GDP per capita, export, import and gold silver price ratio significantly during the given period. Even, there were sharp depreciation of rupee sterling rate, silver price and production and gold price increased with production during the silver standard regime. Thus, gold and silver inflows could not synthesize the silver standard more effective in macro-dynamic adjustment during 1851-1893 although the series of managerial experiments of the commissions and government are equally responsible for instability of the silver standard in India which was equally identical with gold standard in England.

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Week End Effect: Evidence from Indian Stock Market

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Abstract

The study provides the evidence for the presence of seasonality across the days of the week by using the percentage changes of daily closing values of two NSE indices, i.e. CNX 500 index and CNX Sharia 500 index for the period from 1st January 2010 to 31st December 2016. The Kruskal-Wallis nonparametric test (by computing 'H' statistic) is adopted in lieu of parametric one-way analysis of variance in this study to test the week form efficiency of the market. From the results it is observed the market may be inefficient during the short period of time, but in the long run it is efficient. Hence, the investors cannot outperform the market for a long period of time by investing on the particular day of the week.

Introduction

The return behavior of the stock market underwent extensive research in both academic and investment world. Most of the earlier studies observed that the behavior of the stock market is not identical in various time horizons. One of the basic reasons for the changes in stock price is the flow of new information and the investors' reaction to that information. Hence, the term market efficiency is introduced in the capital market theories to explain to what extent the stock prices are reflected to the relevant information.

The Efficient Market Hypothesis (EMH) means the capital market is efficient in processing any information and the current price will incorpo-

rate all such information. Fama (1970) formalized the theory of Efficient Market Hypothesis (EMH) and presented the empirical evidence related to the theory. In his further research, Fama (1991) divided the market efficiency into three sub-hypotheses based on the type of information involved as (1) Weak-form of EMH, (2) Semi-strong form of EMH, and (3) Strong-form of EMH.

The weak form of the hypothesis states that the current price incorporates all information contained in the past series of stock prices. Hence, earning abnormal return is impossible simply by looking past behavior of stock prices, that is the price changes are random. On the other hand, if the market is said to be semi-strong then the investors can't make abnormal return from publicly available information like information on money supply, exchange rate, interest rates, announcement of dividends, annual earnings, stock splits, etc. However, the market is said to be strong form in its information efficiency if the investor is not able to earn abnormal return even from private information.

There are several researchers who have attempted already to explore the week end effect in stock market. Aggarwal et al. (1989) examined the seasonal and day-of-the-week effects in four emerging stock markets namely Hong Kong, Singapore, Malaysia, and the Philippines. He found the weekend effect in those markets as Monday returns were lower than the Friday return. Sunil (1996) found the week form efficiency in BSE during the period from 2nd January 1987

to 31st October, 1994. Choudhry (2000) examined the day of the week effect by using the GARCH model and found the day of the week effect in India, Indonesia, Malaysia, Philippines, South Korea, Taiwan, and Thailand stock markets from January 1990 to June 1995. Ricky and Venus (2010) found the existence of positive Monday effect and negative Friday effects in Indian stock market. Even though many studies already have done in this area, the question about the information efficiency of the market is perennial issue. Hence, the present study also attempting to test the week form efficiencies of the market in Indian context with CNX 500 index and CNX 500 Shariah index.

Statement of the problem

It is found from the earlier research that the Monday return is significantly negative and Friday experiences a high positive return. This observation is generally referred to as 'the day-of-the-week effect' or 'the week- end effect.' In essence, the stock return across all days of the week widely differ thus suggesting wide variation in stock return distribution. The absence of identical mean return across all days of the week may be attributed to, amongst many other factors, asymmetrical information arrival on each day of the week. For instance, as the stock market is closed during the week-end, i.e., on Saturday and Sunday, the information accumulation and processing on these two days will be delayed up to Monday. This results in flood of information processing on Monday and, thereby, wide price swings may be noticed on this day. Many Researchers documented that the bad news is generally released after the market closure on Friday resulting in wide price variation in Monday. Therefore, it is important to study how the Indian stock market reacts on Monday and whether the investors are making abnormal profit or not. Hence this study is undertaken to test the week end effect on CNX500 index and CNX Shariah 100 index.

Objectives

The objectives of the study are as follows,

- To explore the day of week effect on the Indian stock market after financial crisis.
- To assess the daily stock return in the day of week after financial crisis.

Hypothesis

Based on the above objectives the null hypothesis framed as

- H_0 : The mean return across all the five days do not exhibits statistically significant difference.

Data and Methodology

The stock market indices are fairly representative of the various industry sectors and trading activity mostly revolves around the stocks comprising the indices. Thus, the sample of the study consists of the two most prominent domestic market indexes viz., CNX 500 index and CNX Shariah 500 index. The CNX 500 index is India's first broad benchmark of the Indian capital market and CNX Shariah 500 index is one of the family indices of Shariah index which is the complete benchmark for Indian stock market. The daily closing values of the indices was collected from NSE web site for the period of four years from 1st January 2010 to 31stDecember 2016. The daily return of the indices is calculated by using following formula.

$$R = \frac{p_t - p_{t-1}}{p_{t-1}}$$

Here,

R= Daily return of the index

p_t = The closing value of the index at the time t

p_{t-1} =The closing value of the index at the time t-1

Kruskall-Wallis Test

Jason (1996) suggested that the Kruskall-Wallis test is an appropriate one for the data which is having non-normality and theheteroscedastic variance like the security returns. Hence, The Kruskall-Wallis nonparametric test (by computing

'H' statistic) is adopted in lieu of parametric one-way analysis of variance in this study. The accepted model for return is:

$$R_{it} = \mu + \tau_j + \varepsilon_{ij} \quad i=1,2,\dots,n_j$$

$$j=1,2,\dots,5$$

Where μ is the overall daily mean, τ_j quantifies the day effect whose expected value is '0,' and is mutually independent random variable. The null hypothesis for the given model would be that the population means are all equal.

H0: $\mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5$ or

H0: $\tau_j = 0$ for $j = 1, 2, \dots, 5$ and

H1: $\mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5$ or

H1: $\tau_j \neq 0$ for at least one value of j

The Kruskal-Wallis test requires the entire set of observations being ranked, higher the value, higher is the rank and vice-versa, then arranged into $n_j \times 5$ matrix where n_j represents the rank of the return and columns represent the day-of-the-week, i.e. Monday through Friday. The formula for calculating the test statistic 'H' is as under:

$$H = \left[\frac{12}{N(N+1)} \times \sum_{j=1}^5 \frac{R_j^2}{n_j} \right] - 3(N + 1)$$

Where R_j = sum of the ranks in the j th column

n_j = number of cases in the j th column

N = sum of observations in all the columns.

Since the sampling distribution of 'H' is asymptotically χ^2 based on four degrees of freedom, the critical value is 9.488 at 5 per cent level of significance for the given four degrees of freedom. If the computed 'H' is greater than the critical value then the null hypothesis will be rejected.

The descriptive statistics such as mean, median, skewness and kurtosis also used to understand the return series characteristics of CNX500 index and CNX Shariah 500 index. However, the study ignored the holiday effect adjustments as it requires long time for calculation and to collect the information about the stock market holiday. But, the ignorance of holiday effect may not have great influence on the result and the general conclusion as the study covers long period of time i.e. four years, with daily data.

Results and Discussion

From the Table 1 it is observed that the mean return of Monday (0.394) is higher than all other days with standard deviation of 0.884. However, highest standard deviation of 1.077 is observed in Wednesday with the mean return of 0.070. On the other hand, the lower mean return is observed in Tuesday. The negative skewness for Tuesday to Friday indicates the returns are negatively skewed, whereas Monday is slightly positively skewed. The all days mean return is 0.054 with S.D 0.964. It is also observed that the returns are negatively skewed during the period from 1st January 2010 to 31st March 2010.

Table 1: Descriptive statistics and Kruskal-Wallis H statistics for CNX500 index from 01/01/ 2010 to 31/12/2010

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	0.394	-0.164	0.070	0.031	-0.060	0.054
Std. Dev.	0.884	0.866	1.077	0.942	0.988	0.964
Kurtosis	0.049	0.470	2.037	1.297	0.422	1.011
Skewness	0.058	-0.589	-0.871	-0.798	-0.596	-0.566
Count	50	51	49	52	48	250
H Value			8.799			

Kruskall-Wallis 'H' statistics is employed to test whether the differences in mean return across the weekdays are statistically significant or not. The calculated value of 'H' for CNX500 index from 1st January 2010 to 31st December 2010 is

8.799 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

Table 2: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 1/1/2010 to 31/12/2010

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	0.351	-0.143	0.099	0.029	-0.075	0.051
Std. Dev.	0.831	0.839	0.963	0.907	0.908	0.899
Kurtosis	0.667	0.499	0.921	0.728	0.169	0.594
Skewness	0.133	-0.630	-0.573	-0.615	-0.326	-0.401
Count	50	51	49	52	48	250
H Value	7.584					

From the Table 2 it is observed that the mean return of Monday (0.351) is higher than all other days with the standard deviation of 0.831. However, the highest standard deviation of 0.963 is observed in Wednesday with the mean return of 0.099. On the other hand, the lower mean return is observed in Friday. The negative skewness for Tuesday to Friday indicates the returns are negatively skewed, whereas Monday is slightly positively skewed which is similar to

the pattern of CNX 500 index. The mean return of the calendar year 2010 is 0.051 with standard deviation of 0.899. However, the calculated value of 'H' for CNX Sharia 500 index from 1st January 2010 to 31st December 2010 is 7.584 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

Table 3: Descriptive statistics and Kruskal-Wallis H statistics for CNX500 index from 01/01/2011 to 31/12/2011

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	-0.102	-0.087	0.142	-0.317	-0.245	-0.033
Standard Deviation	1.309	1.196	1.076	1.203	1.346	1.107
Kurtosis	0.214	0.226	-0.314	0.503	-0.533	0.347
Skewness	0.353	0.450	0.363	-0.597	0.585	-0.094
Count	50	50	49	47	51	247
H Value	4.144					

Table 3 exhibits that the mean return of Monday (-0.102) is negative with standard deviation of 1.309. However, highest standard deviation of 1.346 is observed in Friday with the negative mean return of -0.246. On the other hand, the lower mean return is observed in Thursday. The range in all day return is higher than any other day. Moreover, the sum of return is negative for

all week days except for Wednesday. The calculated value of 'H' for CNX500 index from 1st January 2011 to 31st December 2011 is 4.144 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

Table 4: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/2011 to 31/12/2011

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	-0.082	0.022	0.170	-0.267	-0.298	-0.019
Standard Deviation	1.172	1.090	0.968	1.084	1.173	1.009
Kurtosis	-0.045	-0.065	-0.249	0.677	-0.443	0.193
Skewness	0.330	0.357	0.323	-0.540	0.460	-0.085
Count	50	50	49	47	51	247
H Value	6.328					

Table 4 shows that the total sum of the daily return is negative in Monday, Thursday and Friday and Wednesday registered the highest sum of return during the year 2011. The mean return of Monday (-0.082) is negative with standard deviation of 1.172. However, Friday registered the highest standard deviation of 1.173 with the negative mean return of -0.298. On the other hand, the lower mean return is observed in Thursday. Also it is observed that except Thursday all other days returns are positively skewed. The all days return is negative (-0.019) with standard deviation of 1.009. The calculated value of 'H' for CNX Sharia 500 index from 1st January 2011 to 31st December 2011 is 6.328 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

The mean return of Monday (-0.133) is negative with standard deviation of 0.931 for the year 2012 which is observed from the Table 5. However, for the same year, highest standard deviation of 1.041 is registered in Friday with the mean return of 0.141. It clearly indicates that the Friday return is high volatile than the other day's return. The skewness is negative for Monday and Thursday and positive for the remaining day's returns. During the calendar year 2012, Tuesday gives the highest total return of 23.004 percent where as Monday registered the negative return of -6.79 percent. The calculated value of 'H' for CNX500 index from 1st January 2012 to 31st December 2012 is 9.817 which is higher than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is rejected and concluded that there is significant difference in the mean return of weekdays.

Table 5: Descriptive statistics and Kruskal-Wallis H statistics for CNX500 index from 01/01/2012 to 31/12/2012

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	-0.133	0.469	0.087	0.025	0.141	0.017
Std. Dev.	0.931	0.925	0.869	0.816	1.041	1.055
Kurtosis	0.571	0.725	1.697	0.749	-0.241	0.480
Skewness	-0.726	0.073	0.126	-0.575	0.497	-0.107
Count	51	49	47	49	51	247
H Value	9.817					

Table 6 exhibits the results of descriptive statistics and H Statistics for the calendar year 2012 for CNX Sharia 500 index. During the year 2012, highest standard deviation of 1.919 is observed in Friday with the mean return of 0.084. The returns are negatively skewed in Monday and Thursday due to extreme returns are presents left side to the mean return. The mean return of the

year 2012 is 0.0105 with the standard deviation of 0.9312. The calculated value of 'H' for CNX Sharia 500 index from 1st January 2012 to 31st December 2012 is 13.025 which is higher than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is rejected and concluded that there is significant difference in the mean return of weekdays.

Table 6: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/2012 to 31/12/2012

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	-0.162	0.378	0.106	-0.047	0.084	0.0105
Standard Deviation	0.733	0.700	0.646	0.613	0.919	0.9312
Kurtosis	0.616	0.522	0.181	0.911	-0.213	0.4375
Skewness	-0.534	0.143	0.296	-0.864	0.203	-0.1130
Count	51	49	47	49	51	247
H Value	13.025					

Table 7: Descriptive statistics and Kruskal-Wallis H statistics for CNX500 index from 1st January 2013 to 31st December 2013

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	0.062	-0.114	-0.068	0.143	0.078	0.020
Standard Deviation	0.910	1.187	0.846	1.265	1.100	1.075
Kurtosis	-0.261	1.710	0.508	-0.163	2.509	1.064
Skewness	-0.089	-0.250	0.417	-0.008	-0.563	-0.136
Count	50	53	46	51	48	248
H Value	1.929					

Table 7 shows that the returns are negatively skewed except for Wednesday. However, lowest standard deviation on Wednesday (0.846) indicates that the return of Wednesday is less volatile than any other day. The Kurtosis values are less than three which indicates the probability for extreme values is less than for a normal distribution, and the returns are wider spread around the average returns. The calculated value

of 'H' for CNX500 index from 1st January 2013 to 31st December 2013 is 1.929 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays. Hence, investors can not earn abnormal return by buying on Monday and selling on Friday.

Table 8: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/2013 to 31/12/2013

	Monday	Tuesday	Wednesday	Thursday	Friday	All Days
Mean	0.059	-0.009	0.049	0.080	0.138	0.023
Standard Deviation	0.777	0.980	0.769	1.020	0.995	0.926
Kurtosis	-0.225	2.028	0.743	-0.362	2.590	0.588
Skewness	0.194	-0.532	0.030	0.266	-0.774	-0.138
Count	50	53	46	51	48	248
H Value	0.983					

From the Table 8 it is observed that the mean return for Monday is 0.059 per cent with the standard deviation of 0.777. However, Monday registered the lowest standard deviation which indicates the return on Monday is less volatile than any other day during the period. The daily returns are positively skewed except Tuesday and Friday. The less value of kurtosis for Monday indicates that the returns are distributed around

the mean and the risk is very less. The all days mean return is 0.023 with the S.D of 0.926. The calculated value of 'H' for CNX Sharia 500 index from 1st January 2013 to 31st December 2013 is 0.983 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

Table 9: Descriptive statistics and Kruskal-Wallis H statistics for CNX 500 index from 1st January 2014 to 31st December 2014

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.031	0.011	0.021	0.032	0.025	0.024
Standard Deviation	0.987	0.954	0.566	0.921	1.200	1.018
Kurtosis	0.991	0.949	-0.292	0.107	0.196	0.676
Skewness	-0.414	-0.911	-0.001	0.204	-0.065	-0.305
Count	49	49	51	46	47	243
H Value	4.078					

Table 9 exhibits the descriptive statistics and Kruskal Wallis H test for the return of CNX 500 index for the calendar year 2014. It is observed from the result that the average daily return is positive for all the day of the week in the year. However, low values of Kurtosis indicate the

distribution of the return is around the mean return and having less risk. Moreover, the calculated H-Value of 4.078 is lesser than the table value of 9.488, which leads to accept the null hypothesis and concluded that there is no significant difference in the mean return of different day of the week.

Table-10: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/ 2014 to 31/12/2014

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.02	0.005	0.012	0.012	0.023	0.015
Standard Deviation	0.075	0.828	0.638	0.825	0.832	0.745
Kurtosis	-0.522	1.322	-0.618	1.052	-0.527	0.489
Skewness	-0.156	-0.516	-0.270	-0.163	-0.196	-0.296
Count	49	49	51	46	47	243
H Value	2.159					

From the Table 10 it is observed that CNX Sharia 500 index registered the lowest average return on Tuesday. The negative values of skewness indicate that the distribution of CNX Sharia 500 index return is negatively skewed for the calendar

year 2104. The calculated H-Value of 2.159 is much lesser than the critical value of 9.488. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of week days.

Table 11: Descriptive statistics and Kruskal-Wallis H statistics for CNX 500 index from 1st January 2015 to 31st December 2015

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	-0.011	-0.031	0.020	0.03	0.012	0.021
Standard Deviation	1.031	0.902	0.962	0.929	0.911	1.025
Kurtosis	10.798	1.202	0.954	0.171	-0.230	7.171
Skewness	-2.345	-1.074	-0.687	0.058	-0.048	-1.385
Count	51	50	51	49	46	248
H Value	47.434					

Table 12: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/ 2015 to 31/12/2015

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	-0.01	-0.01	0.02	0.01	0.003	0.04
Standard Deviation	1.301	0.985	0.812	0.845	0.931	0.945

Kurtosis	12.963	1.079	0.397	-0.304	-0.524	9.484
Skewness	-2.721	-1.037	-0.330	-0.172	0.014	-1.653
Count	51	50	51	49	46	248
H Value	47.196					

Table 11 and 12 show the descriptive statistics and Kruskal-Wallis H statistics for CNX 500 index and CNX Sharia 500 index respectively. Both the indices registered the highest negative skewness on Monday and positive average daily return for Wednesday, Thursday and Friday. However, the calculated value of Kruskal-Wallis H test is

47.434 for CNX 500 index and 47.196 for CNX Sharia 500 index which is higher than the table value of 9.488. Hence, the null hypothesis is rejected and concluded that there is a day of the week effect in the calendar year 2015 for both the selected index.

Table 13: Descriptive statistics and Kruskal-Wallis H statistics for CNX 500 index from 1st January 2016 to 31st December 2016

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.034	0.039	0.041	-0.134	0.120	0.020
Standard Deviation	1.001	1.021	0.998	1.009	0.944	1.040
Kurtosis	0.354	1.955	0.132	1.612	2.026	1.234
Skewness	0.082	0.007	0.066	-0.870	-0.709	-0.296
Count	47	48	50	50	50	246
H Value	29.237					

Table 14: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 index from 01/01/2016 to 31/12/2016

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.022	0.008	0.071	-0.097	0.091	0.020
Standard Deviation	1.901	0.933	1.001	0.989	0.975	0.945
Kurtosis	0.379	2.156	0.104	1.438	2.111	1.180
Skewness	0.047	-0.396	-0.187	-0.846	-0.572	-0.396
Count	47	48	50	50	50	246
H Value	28.428					

Table 13 and 14 exhibits the results of descriptive statistics and H Statistics for the calendar year 2016 for CNX 500 index and CNX Sharia 500 index respectively. The returns are negatively skewed on Tuesday, Wednesday, Thursday and

Friday for CNX Sharia 500 index whereas the returns were negatively skewed only for Thursday and Friday due to extreme returns are presents left side to the mean return. The calculated value of 'H' for CNX 500 index and CNX Sharia 500

index is 29.237 and 28.428 respectively which are higher than the table value of 9.488 at 5 per cent level of significance. Hence, the null

hypothesis is rejected and concluded that there is a significant difference in the mean return of the weekdays.

Table 15: Descriptive statistics and Kruskal-Wallis H statistics for CNX 500 Index from 1st January 2010 to 31st December 2016

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.326	0.124	0.336	-0.147	-0.123	0.105
Standard Deviation	0.788	0.821	0.725	0.818	0.861	0.803
Kurtosis	2.921	3.731	4.038	3.515	2.502	3.295
Skewness	0.001	-0.043	0.041	-0.577	0.029	-0.124
Count	348	350	343	344	341	1726
H Value	1.918					

The descriptive statistics and Kruskal-Wallis H statistics for CNX500 index during the entire study period from 1st January 2010 to 31st December 2016 is exhibited in Table 15. Friday registered the highest variability with standard deviation of 0.861 and the lowest average return is observed in Thursday. The negative skewness for Tuesday and Thursday indicates the returns are negatively

skewed. The calculated value of 'H' for CNX500 index from 1st January 2010 to 31st December 2016 is 1.918 which is lower than the table value of 9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays for the overall study period.

Table 16: Descriptive statistics and Kruskal-Wallis H statistics for CNX Sharia 500 Index from 01/01/ 2010 to 31/12/2016

	Monday	Tuesday	Wednesday	Thursday	Friday	Overall
Mean	0.243	0.342	0.603	-0.276	-0.234	0.145
Standard Deviation	0.690	0.707	0.632	0.703	0.771	0.702
Kurtosis	3.010	3.691	3.404	3.653	2.397	3.227
Skewness	0.214	-0.164	0.184	-0.551	-0.192	-0.140
Count	348	350	343	344	341	1726
H Value	3.258					

Table 16 exhibits the results of descriptive statistics and Kruskal-Wallis H statistics for the CNX Sharia 500 index during the study period from the calendar year 2010 to 2016. Highest standard deviation of 0.771 is noted in Friday with the negative mean return of -0.234. This clearly indicates that the market is more volatile

in Friday than any other days. The return of the CNX Sharia 500 index is negatively skewed except for Monday and Wednesday. The Kurtosis indicates that the return is leptokurtic. The calculated value of 'H' for CNX Sharia 500 index from 1st January 2010 to 31st December 2016 is 3.258 which is lower than the table value of

9.488 at 5 per cent level of significance. Hence, the null hypothesis is accepted and concluded that there is no significant difference in the mean return of weekdays.

Conclusion

The present study aims at exploring the presence of seasonality in the Indian stock market returns after financial crisis of 2008. The study provides the evidence for the presence of seasonality across the days of the week by using the percentage changes of daily closing values of two NSE indices, i.e. CNX 500 index and CNX Sharia 500 index for the period from 1st January 2010 to 31st December 2016. For the overall period, the study accepts the null hypothesis and concluded that there is no significant difference in the mean return of weekdays. However, for the calendar year 2012, 2015 and 2016, there is an evidence of significant difference in the weekday returns. During the calendar year 2012 the market were in sideways, the year 2015 the market was under the control of bear and the year 2016 the market enjoyed the bull run. On the other hand, the year 2010 and 2011 were not registered the significant weekday difference in their returns. The result clearly indicates that the market may be inefficient in the short term, but in the long run the market is efficient. Hence, the investors cannot outperformance the market and enjoy the super normal profit consistently for long period of time. Moreover, the results consistent with the earlier studies as the leptokurtic distribution of equity returns; presence of highest variance on Friday and regularity of returns across the weekdays.

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Development of Financial Derivatives

Market-in Indian context

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Abstract

Risk is a characteristic feature of most commodity and capital markets. Variations in the prices of agricultural and non-agricultural commodities are induced, over time, by demand-supply dynamics. The last two decades have witnessed many-fold increase in the volume of international trade and business due to the wave of globalization and liberalization sweeping across the world. This has led to rapid and unpredictable variations in financial assets prices, interest rates and exchange rates, and subsequently, to exposing the corporate world to an unwieldy financial risk. In the present highly uncertain business scenario, the importance of risk management is much greater than ever before. The emergence of derivatives market is an ingenious feat of financial engineering that provides an effective and less costly solution to the problem of risk that is embedded in the price unpredictability of the underlying asset. In India, the emergence and growth of derivatives market is relatively a recent phenomenon. Since its inception in June 2000, derivatives market has exhibited exponential growth both in terms of volume and number of traded contracts. The market turnover has grown from Rs.2365 crore in 2000-2001 to Rs.11010482.20 crore in 2008-2009. Within a short span of eight years, derivatives trading in India has surpassed cash segment in terms of turnover and number of traded contracts. The present study encompasses in its scope an analysis of historical roots of

derivative trading, types of derivative products, regulation and policy developments, trend and growth, future prospects and challenges of derivative market in India. Some space is devoted also to a brief discussion of the status of global derivatives markets in Indian context Indian derivatives.

Keywords: Forward, Futures, Options, Financial Derivatives, Risk Management, Exchange rates

Introduction

Risk is a characteristic feature of all commodity and capital markets. Overtime, variations in the prices of agricultural and non-agricultural commodities occur as a result of interaction of demand and supply forces. The last two decades have witnessed a many-fold increase in the volume of international trade and business due to the ever growing wave of globalization and liberalization sweeping across the world. As a result, financial markets have experienced rapid variations in interest and exchange rates, stock market prices thus exposing the corporate world to a state of growing financial risk. Increased financial risk causes losses to an otherwise profitable organization. This underlines the importance of risk management to hedge against uncertainty. Derivatives provide an effective solution to the problem of risk caused by uncertainty and volatility in underlying asset. Derivatives are risk management tools that help an organization to effectively transfer risk. Derivatives are instruments which have no independent value. Their value depends upon the

underlying asset. The underlying asset may be financial or non-financial. The present study attempts to discuss the genesis of derivatives trading by tracing its historical development, types of traded derivatives products, regulation and policy developments, trend and growth, future prospects and challenges of derivative market in India. The study is organized into four sections. Section I deals with the concept, definition, features and types of financial derivatives. Section II has been devoted to a discussion of the growth of derivatives market, and regulation and policy development. Section III discusses status of global derivatives market vis-a-vis Indian derivatives market. The last section specifies summary and concluding remarks.

Section I

1. Concept of Derivatives

The term 'derivatives, refers to a broad class of financial instruments which mainly include options and futures. These instruments derive their value from the price and other related variables of the underlying asset. They do not have worth of their own and derive their value from the claim they give to their owners to own some other financial assets or security. A simple example of derivative is butter, which is derivative of milk. The price of butter depends upon price of milk, which in turn depends upon the demand and supply of milk. The general definition of derivatives means to derive something from something else. Some other meanings of word derivatives are:

- a) Derived function: the result of mathematical differentiation; the instantaneous change of one quantity relative to another; $df(x)/dx$,
- b) Derivative instrument: a financial instrument whose value is based on another security, (linguistics) a word that is derived from another word; 'electricity' is a derivative of 'electric'. The asset underlying a derivative may be commodity or a financial asset. Derivatives are those financial instruments that derive their value from the other assets. For example, the price of gold to be delivered

after two months will depend, among so many things, on the present and expected price of this commodity.

1.1. Definition of Financial Derivatives

Section 2(ac) of Securities Contract Regulation Act (SCRA) 1956 defines Derivative as:

- A) A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security.
- B) A contract which derives its value from the prices, or index of prices, of underlying securities.

1.2. Underlying Asset in a Derivatives Contract

As defined above, the value of a derivative instrument depends upon the underlying asset. The underlying asset may assume many forms:

- A) Commodities including grain, coffee beans, orange juice;
- B) Precious metals like gold and silver;
- C) Foreign exchange rates or currencies;
- D) Bonds of different types, including medium to long term negotiable debt securities issued by governments, companies, etc.
- E) Shares and share warrants of companies traded on recognized stock exchanges and Stock Index
- F) Short term securities such as T-bills; and
- G) Over- the Counter (OTC) money market products such as loans or deposits.

1.3 Participants in Derivatives Market

1. Hedgers: They use derivatives markets to reduce or eliminate the risk associated with price of an asset. Majority of the participants in derivatives market belongs to this category.
2. Speculators: They transact futures and options contracts to get extra leverage in betting on future movements in the price of an asset. They can increase both the potential gains and potential losses by usage of derivatives in a speculative venture.

3. Arbitrageurs: Their behavior is guided by the desire to take advantage of a discrepancy between prices of more or less the same assets or competing assets in different markets. If, for example, they see the futures price of an asset getting out of line with the cash price, they will take off setting positions in the two markets to lock in a profit.

1.4. Applications of Financial Derivatives

Some of the applications of financial derivatives can be enumerated as follows:

1. Management of risk: This is most important function of derivatives. Risk management is not about the elimination of risk rather it is about the management of risk. Financial derivatives provide a powerful tool for limiting risks that individuals and organizations face in the ordinary conduct of their businesses. It requires a thorough understanding of the basic principles that regulate the pricing of financial derivatives. Effective use of derivatives can save cost, and it can increase returns for the organizations.
2. Efficiency in trading: Financial derivatives allow for free trading of risk components and that leads to improving market efficiency. Traders can use a position in one or more financial derivatives as a substitute for a position in the underlying instruments. In many instances, traders find financial derivatives to be a more attractive instrument than the underlying security. This is mainly because of the greater amount of liquidity in the market offered by derivatives as well as the lower transaction costs associated with trading a financial derivative as compared to the costs of trading the underlying instrument in cash market.
3. Speculation: This is not the only use, and probably not the most important use, of financial derivatives. Financial derivatives are considered to be risky. If not used properly, these can lead to financial destruction in an organization like what happened in Barings Plc. However, these instruments act as a powerful instrument for knowledgeable

traders to expose themselves to calculated and well understood risks in search of a reward, that is, profit.

4. Price discover: Another important application of derivatives is the price discovery which means revealing information about future cash market prices through the futures market. Derivatives markets provide a mechanism by which diverse and scattered opinions of future are collected into one readily discernible number which provides a consensus of knowledgeable thinking.
5. Price stabilization function: Derivative market helps to keep a stabilizing influence on spot prices by reducing the short-term fluctuations. In other words, derivative reduces both peak and depths and leads to price stabilization effect in the cash market for underlying asset.

1.5. Classification of Derivatives

Broadly derivatives can be classified into two categories: Commodity derivatives and financial derivatives. In case of commodity derivatives, underlying asset can be commodities like wheat, gold, silver etc., whereas in case of financial derivatives underlying assets are stocks, currencies, bonds and other interest rates bearing securities etc. Since, the scope of this case study is limited to only financial derivatives so we will confine our discussion to financial derivatives only.

1.5.1. Forward Contract

A forward contract is an agreement between two parties to buy or sell an asset at a specified point of time in the future. In case of a forward contract the price which is paid/ received by the parties is decided at the time of entering into contract. It is the simplest form of derivative contract mostly entered by individuals in day to day's life.

1.5.2. Futures Contract

Futures is a standardized forward contract to buy (long) or sell (short) the underlying asset at specified price at a specified future date through a specified exchange. Futures contracts are traded on exchanges that work as a buyer or seller for the counterparty. Exchange sets the

standardized terms in term of Quality, quantity, Price quotation, Date and Delivery place (in case of commodity).The features of a futures contract may be specified as follows:

- i These are traded on an organized exchange like IMM, LIFFE, NSE, BSE, CBOT etc.
- ii These involve standardized contract terms viz. the underlying asset, the time of maturity and the manner of maturity etc.
- iii These are associated with a clearing house to ensure smooth functioning of the market.
- iv There are margin requirements and daily settlement to act as further safeguard.
- v These provide for supervision and monitoring of contract by a regulatory authority.
- vi Almost ninety percent future contracts are settled via cash settlement instead of actual delivery of underlying asset. Futures contracts being traded on organized exchanges impart liquidity to the transaction. The clearinghouse, being the counter party to both sides of a transaction, provides a mechanism that guarantees the honouring of the contract and ensuring very low level of default (Hirani, 2007).

Following are the important types of financial futures contract:-

1. Stock Future or equity futures,
2. Stock Index futures,
3. Currency futures, and
4. Interest Rate bearing securities like Bonds, T- Bill Futures. To give an example of a futures contract, suppose on November 2007 Ramesh holds 1000 shares of ABC Ltd. Current (spot) price of ABC Ltd shares is Rs 115 at National Stock Exchange (NSE). Ramesh entertains the fear that the share price of ABC Ltd may fall in next two months resulting in a substantial loss to him. Ramesh decides to enter into futures market to protect his position at Rs 115 per share for delivery in January 2008. Each contract in futures market is of 100 Shares. This is an example

of equity future in which Ramesh takes short position on ABC Ltd. Shares by selling 1000 shares at Rs 115 and locks into future price.

1.5.3. Options Contract

In case of futures contact, both parties are under obligation to perform their respective obligations out of a contract. But an options contract, as the name suggests, is in some sense, an optional contract. An option is the right, but not the obligation, to buy or sell something at a stated date at a stated price. A "call option" gives one the right to buy; a "put option" gives one the right to sell. Options are the standardized financial contract that allows the buyer (holder) of the option, i.e. the right at the cost of option premium, not the obligation, to buy (call options) or sell (put options) a specified asset at a set price on or before a specified date through exchanges.

Options contracts are of two types: call options and put options. Apart from this, options can also be classified as OTC (Over the Counter) options and exchange traded options. In case of exchange traded options contract, contracts are standardized and traded on recognized exchanges, whereas OTC options are customized contracts traded privately between the parties. A call options gives the holder (buyer/one who is long call), the right to buy specified quantity of the underlying asset at the strike price on or before expiration date. The seller (one who is short call) however, has the obligation to sell the underlying asset if the buyer of the call option decides to exercise his option to buy.

Suppose an investor buys One European call options on Infosys at the strike price of Rs. 3500at a premium of Rs. 100. Apparently, if the market price of Infosys on the day of expiry is more than Rs. 3500, the options will be exercised. In contrast, a put options gives the holder (buyer/ one who is long put), the right to sell specified quantity of the underlying asset at the strike price on or before an expiry date. The seller of the put options (one who is short put) however, has the obligation to buy the underlying

asset at the strike price if the buyer decides to exercise his option to sell. Right to sell is called a Put Options. Suppose X has 100 shares of Bajaj Auto Limited. Current price (March) of Bajaj auto shares is Rs 700 per share. X needs money to finance its requirements after two months which he will realize after selling 100 shares after two months. But he is of the fear that by next two months price of share will decline. He decides to enter into option market by buying Put Option (Right to Sell) with an expiration date in May at a strike price of Rs 685 per share and a premium of Rs 15 per shares.

1.5.4 Swaps Contract

A swap can be defined as a barter or exchange. It is a contract whereby parties agree to exchange obligations that each of them have under their respective underlying contracts or we can say, a swap is an agreement between two or more parties to exchange stream of cash flows over a period of time in the future. The parties that agree to the swap are known as counter parties. The two commonly used swaps are: i) Interest rate swaps which entail swapping only the interest related cash flows between the parties in the same currency, and ii) Currency swaps: These entail swapping both principal and interest between the parties, with the cash flows in one direction being in a different currency than the cash flows in the opposite direction

Section II

2. History of Derivatives Markets in India

Derivatives markets in India have been in existence in one form or the other for a long time. In the area of commodities, the Bombay Cotton Trade Association started futures trading way back in 1875. In 1952, the Government of India banned cash settlement and options trading. Derivatives trading shifted to informal forwards markets. In recent years, government policy has shifted in favour of an increased role of market-based pricing and less suspicious derivatives trading. The first step towards introduction of financial derivatives trading in India was the promulgation of the Securities

Laws (Amendment) Ordinance, 1995. It provided for withdrawal of prohibition on options in securities. The last decade, beginning the year 2000, saw lifting of ban on futures trading in many commodities. Around the same period, national electronic commodity exchanges were also set up.

Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2001 on the recommendation of L.C Gupta committee. Securities and Exchange Board of India (SEBI) permitted the derivatives segments of two stock exchanges, NSE and BSE and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. Initially, SEBI approved trading in index futures contracts based on various stock market indices such as, S&P CNX, Nifty and Sensex. Subsequently, index-based trading was permitted in options as well as individual securities.

India's derivatives markets, both OTC and exchange-traded, have seen rapid growth over the last decade, and with relatively few sputters. The successes are visible and real-several Indian exchanges rank among the world's top exchanges in terms of number of derivatives contracts traded (though the figures are exaggerated by the small size of Indian contracts compared to the major international exchanges); and there have been no large scale derivatives disasters of the sort that have roiled the advanced economies. But problems lurk not far beneath the surface. Many underlying markets are illiquid and lack depth, simultaneously increasing the need for alternative risk-management tools and hampering the development of the corresponding derivatives markets. Anecdotal evidence suggests too that Indian exchanges may be losing volumes to overseas competitors because of regulatory burdens. The challenge in this environment is to find away to sustain the growth and deepen the market, making tools of risk-management more widely available to corporate and banks, even while avoiding speculative excesses. In this context, the recent Dodd-Frank reforms in the

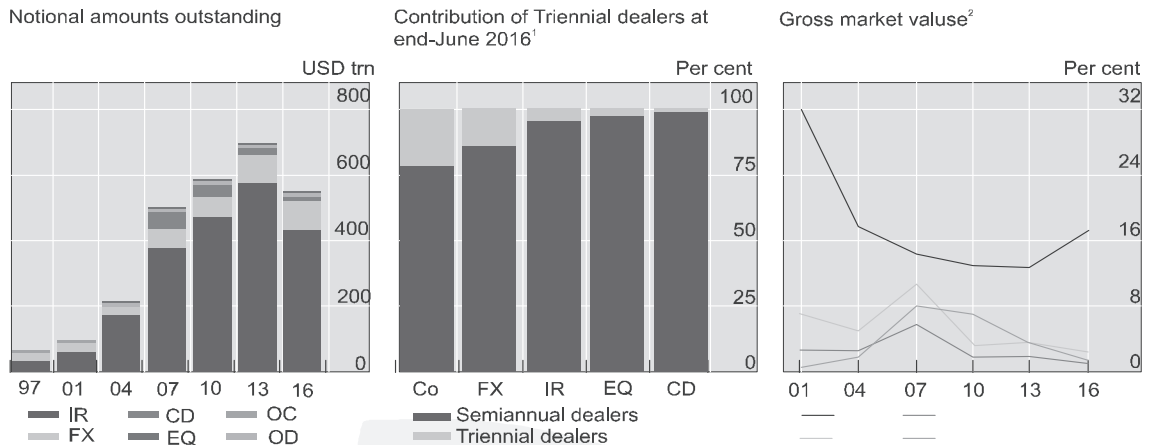
US offer a useful framework for thinking about issues. The Dodd-Frank Act has as its objectives the minimization of systemic risk from derivatives

use and increasing the transparency of the OTC derivatives market. Towards these ends, the Act has mandated, among other things, that those OTC derivatives that are sure

Global OTC derivatives markets, by underlying risk

Outstanding positions at end-June of the indicated year

Graph 1



CD - credit derivatives; Co - Commodity derivatives; EQ = equity-linked derivatives; FX - foreign exchange derivatives; IR = single-currency interest rate derivatives, OD = other OTC derivatives.

As a percentage of notional amounts outstanding at end-June 2016. Semiannual dealers refer to reporting dealers who participate in the semiannual survey, and Triennial dealers refer to those who participate only in the Triennial Survey, ie excluding semiannual dealers. For a list of countries whose dealers participate in this semiannual and Triennial surveys, see Annex C. : As a percentage of the gross market value of all outstanding OTC derivatives.

Source: BIS Triennial Central Bank Survey. Further information is available at www.bis.org/publ/rpx16.htm.

Most interest rate derivatives are centrally cleared

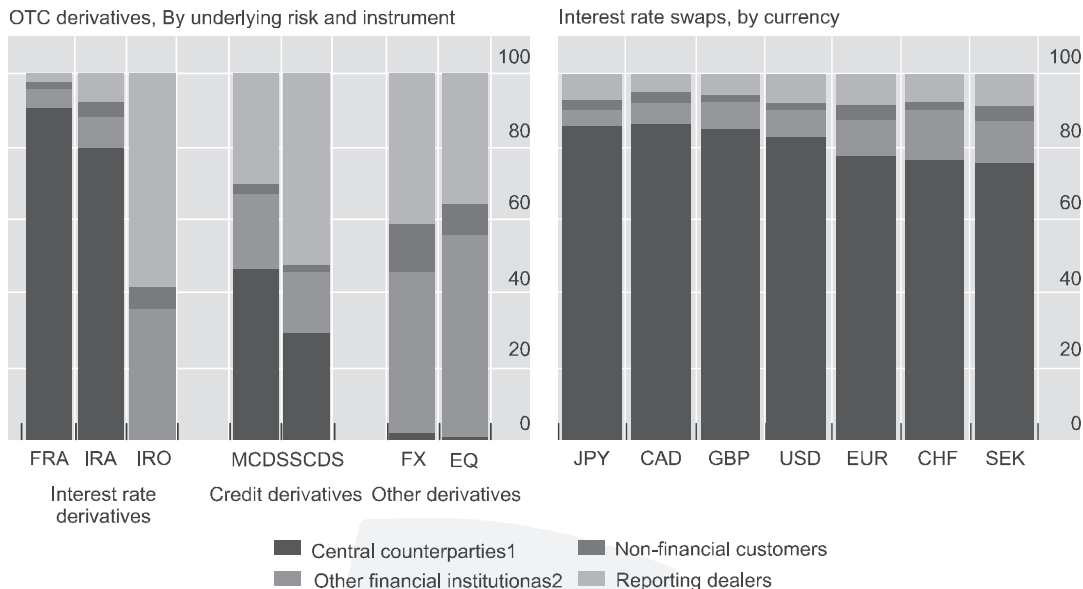
For the first time, the latest semiannual and triennial surveys captured comprehensive data on positions with CCPs. Whereas in previous surveys details about financial counterparties were collected only for CDS, at end-June 2016 CCPs were separately identified for all types of OTC derivatives. Central clearing is a key element in authorities' agenda for reforming OTC derivatives markets to reduce systemic risks. These new data show that central clearing has made very significant inroads into OTC interest

rate derivatives markets but is much less prevalent in other OTC derivatives segments. The share of reporting dealers' positions booked against CCPs is highest for interest rate derivatives, where it stood at 75% at end-June 2016. It is important to note that this share refers to the outstanding positions of reporting dealers and not the share of trades cleared through CCPs; as a share of outstanding positions, contracts with CCPs are counted twice, whereas as a share of trades each contract would be counted once.

Significance of central clearing

Types of counterparties, as a percentage of national amounts outstanding at end-June 2016

Graph 2



FRA = forward rate agreement: FX = foreign exchange derivatives: IRS = interest rate swaps: IRO = interest rate options: EQ = equity-linked derivative: MCDS = multi-name credit default swaps: SCDS = single-name credit default swaps.

¹ Contracts between reporting dealers that are subsequently novated CCPs are recorded twice (reported once by each dealer). See footnote 4 on page 6 of the main text. ² excluding central counter parties and reporting dealers.

Source: BIS Triennial Central Bank Survey. Further information is available at www.bis.org/publ/rpfx16.htm.

Among interest-rate instruments, the share of positions booked against CCPs is highest for forward rate agreements and interest rate swaps, at 91% and 80%, respectively (Graph 2, left-handpanel). For interest rate options, the share of CCPs is close to zero. The importance of CCPs does not vary a lot across major currencies, ranging from 76% for interest rate swaps denominated in Swedish krona to 86% for those in Canadian dollars and Japanese yen, with US dollars in between at 83% (Graph 2, right hand panel).

While comprehensive data on central clearing are available only from end-June 2016, the share of positions with other financial institutions - from the historical counterparty distribution of OTC derivatives - can be used to approximate the pace of the shift in activity towards CCPs in recent years. Previously, CCPs were grouped

indistinguishably with all financial institutions other than dealers, and the latest data show that CCPs accounted for most of the positions reported with this group of counterparties.

The share of interest rate derivatives with financial institutions other than dealers climbed from 61% of notional amounts outstanding at end-June 2010 to 75% at end-June 2013 and 86% at end-June 2016. In contrast, the inter-dealer segment declined in importance, from 30% to 12% over this period. These opposing trends likely reflect the novation of inter-dealer contracts to CCPs. The notional principal of interest rate contracts between derivatives dealers has been falling more or less steadily since the Great Financial Crisis, dropping from \$163 trillion at end-June 2007 to \$50 trillion at end-June 2016. Central clearing is also gaining in importance in credit derivatives markets.

The proportion of outstanding credit default swaps (CDS) cleared through CCPs has increased steadily since these data were first reported in 2010, from 10% at end-June 2010 to 23% at end-June 2013 and 37% at end-June 2016. The share of CCPs is higher for multi-name products than for single-name products: 47% versus 29% (Graph 2, left-hand panel). Multi-name products, which consist primarily of contracts on CDS indices, tend to be more standardized than single-name products and consequently more amenable to central clearing. As CDS become more standardized, CCPs' share of newer contracts is likely to increase. Nevertheless, CDS with remaining maturity of one year or less have

a lower share of central clearing (27%) than those maturing in one to five years (41%).

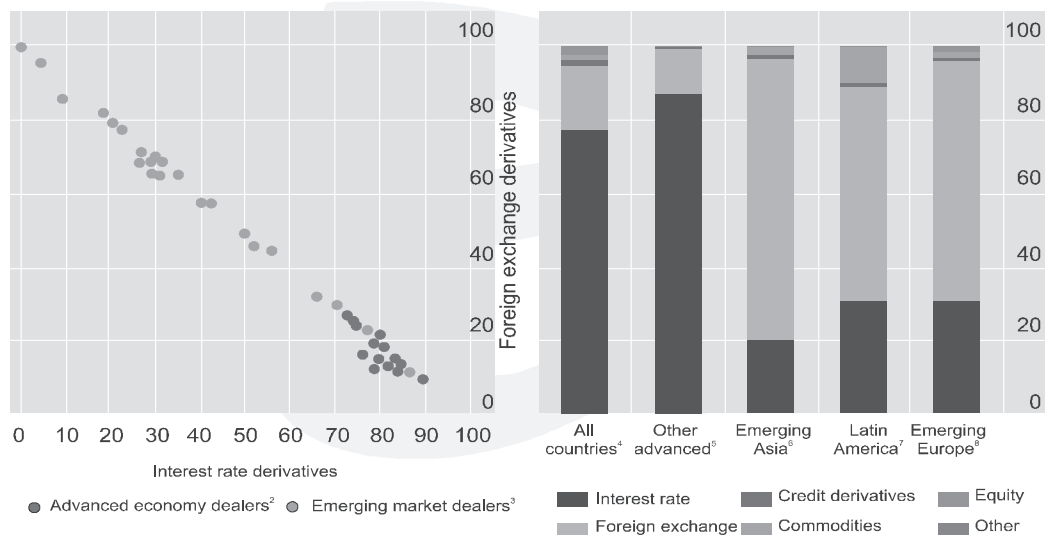
In contrast, dealers from advanced economies are active in a wider range of markets. For many major dealers, contracts denominated in their domestic currency accounted for less than 50% of their outstanding interest rate derivatives, with contracts in US dollars or euros accounting for much of the remainder (Graph 4, left-hand panel). Similarly, many manage FX risks not linked to their domestic currency. For a few dealers from advanced economies, FX contracts involving their domestic currency on one side accounted for less than 30% of the outstanding notional positions (Graph 4, right-hand panel).

Risk Composition of outstanding positions, by nationality of dealer

As a percentage of all OTC derivatives outstanding at end-June 2016

Graph 3

National amounts of interest rate and FX derivatives¹ Gross market values, by region where dealer is based



¹ Dots show the risk composition of national amount reported by dealers headquartered in each country participating in the semiannual and triennial surveys. For a list of participating countries, see Annex C. Dealers report their worldwide consolidated positions. ²Dealers from AU, AT, BE, CA, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, JP, NL, NO, PT, SE and US. ³ Dealers from countries that participate in the Triennial Survey, excluding those listed in footnote 2. See Annex C. ⁴All countries that participate in the semiannual and triennial surveys. ⁵AT, DK, FI, GR, IE, NO, PT. Excludes dealers from the 13 countries that participate in the semiannual survey. ⁶CN, HK, ID, IN, KR, MY, PH, SG, TH, TW. ⁷AR, BR, CL, CO, MX, PE. ⁸HU, LV, PL, RO, RU, and TR, plus the Middle East (BH, IL, SA) and Africa (ZA).

Sources: BIS Triennial Central Bank Survey. Further information is available at www.bis.org/publ/rpfx16.htm.

Table: Global OTC derivatives markets

 Amounts outstanding, in billions of US dollars²

	National amounts outstanding			Gross market value		
	end-June 2010	end-June 2013	end-June 2016	end-June 2010	end-June 2013	end-June 2016
GRAND TOTAL	582, 683	696,120	544,052	24,695	20,234	20,701
A. Foreign exchange contracts	62,961	80,917	85,170	3,179	2,613	3,558
Forwards and swaps	31,934	39,495	46,889	1,335	1,082	1,698
Currency swaps	18,903	26,292	25,855	1,386	1,169	1,550
Options	12,123	15,074	12,907	458	362	310
Other	1	56	60	...	...	...
B. Interest rate contracts²	478,093	580,599	437,739	18,508	15,763	16,005
Forward rate agreements	60,028	89,992	74,727	204	276	381
Interest rate swaps	367,541	439,838	327,445	16,703	14,135	14,226
Options	50,519	50,191	35,427	1,600	1,352	1,397
Other	5	579	140	...	...	...
C. Equity-linked contracts	6,868	6,963	6,761	796	706	522
Forwards and swaps	1,854	2,350	2,592	202	209	175
Options	5,013	4,614	4,169	595	498	347
D. Commodity contracts³	3,273	2,717	1,761	493	391	260
Gold	669	610	500	54	83	47
Other	2,604	2,108	1,261	439	309	212
Forwards and swaps	1,686	1,394	936	...	...	...
Options	918	714	325	...	...	...
E. Credit derivatives	31,416	24,845	11,991	1,708	732	351
Forwards and swaps	31,331	24,497	11,881	...	...	...
CDS	31,057	24,469	11,861	1,694	728	346
Single-name instruments	18,920	13,211	6,681	1,012	432	219
Multi-name instruments	12,136	11,258	5,180	681	296	127
Index products	7,500	10,163	4,836	...	...	...
Options	85	348	110	...	...	...
F. Other derivatives	72	78	89	12	29	6
Forwards and swaps	38	63	75	...	...	...
Options	34	15	14	...	...	...
GROSS CREDIT EXPOSURE⁴	...	...	...	3,581	3,784	3,692
Memo: Exchange-traded contracts ⁵	69,898	62,503	67,700	...	...	...

All figures are adjusted for double-counting of trades between dealers. Notional amounts outstanding have been adjusted by halving positions vis-à-vis other reporting dealers. Gross market values have been calculated as the sum of the total gross positive market value of contracts and the absolute value of the gross negative market value of contracts with non-reporting counterparties. 2 Single currency

contracts only. 3 Adjustments for double-counting partly estimated.

Gross market values after taking into account legally enforceable bilateral netting agreements. 5 Open interest of foreign exchange and interest rate futures and options traded worldwide. Sources: Euromoney TRADEDATA, Futures Industry Association; The Options Clearing Corporation; BIS derivatives statistics.

Authorities from an additional 33 countries participated in the outstanding position part of the latest Triennial Central Bank Survey of FX and OTC Derivatives markets.

Country	Reporting authority	Country	Reporting authority
Argentina	Central Bank of Argentina	Israel	Bank of Israel
Austria	Central Bank of the Republic of Austria	Korea	Bank of Korea
Bahrain	Bahrain Monetary Agency	Latvia	Bank of Latvia
Brazil	Central Bank of Brazil	Malaysia	Central Bank of Malaysia
Chile	Central Bank of Chile	Mexico	Bank of Mexico
China	People's Bank of China	Norway	Central Bank of Norway
	State Administration of Foreign Exchange	Peru	Central Reserve Bank of Peru
Chinese Taipei	Central Bank of China	Philippines	Bangko Sentral ng Pilipinas
Colombia	Bank of the Republic	Poland	Narodowy Bank Polski
Denmark	Denmarks National Bank	Portugal	Bank of Portugal
Finland	Bank of Finland	Romania	National Bank of Romania
Greece	Bank of Greece	Russia	Central Bank of the Russian Federation
Hong Kong SAR	Hong Kong Monetary Authority	Saudi Arabia	Saudi Arabian Monetary Agency
Hungary	Magyar Nemzeti Bank	Singapore	Monetary Authority of Singapore
India	Reserve Bank of India	South Africa	South African Reserve Bank
Indonesia	Bank Indonesia	Thailand	Bank of Thailand
Ireland	Central Bank of Ireland	Turkey	Central Bank of the Republic Turkey

OTC derivatives statistics at end-June 2016

Bulgaria participated in the outstanding positions part of the Triennial Survey from 2007 to

2013. Australia and Spain participated only in the Triennial Survey through 2010 and from end-2011 participated in the semiannual survey too. An additional six countries participated in the turnover part of the latest Triennial Central Bank Survey. The market share of dealers that participate in the semiannual survey varies across risk categories. It is highest in the credit, equity and interest rate segments (99%, 98% and 96%, respectively, at end-June 2016) and lowest in the commodity and foreign exchange segments (79% and 86%). Overall, the results of the Triennial Survey indicate that the semiannual survey captured about 94% of global OTC derivatives positions at end-June 2016. The next Triennial Survey of outstanding positions will be conducted in June 2019.

Section IV

4. Summary and Concluding Remarks

Innovation of derivatives have redefined and revolutionized the landscape of financial industry across the world and derivatives have earned a well deserved and extremely significant place among all the financial products. Derivatives are risk management tool that help in effective management of risk by various stakeholders. Derivatives provide an opportunity to transfer risk, from the one who wish to avoid it; to one, who wish to accept it. India's experience with the launch of equity derivatives market has been extremely encouraging and successful. The derivatives turnover on the NSE has surpassed the equity market turnover. Significantly, its growth in the recent years has surpassed the growth of its counterpart globally.

The turnover of derivatives on the NSE increased from Rs. 23,654 million (US \$ 207 million) in 2000-01 to Rs. 130,904,779 million (US \$ 3,275,076 million) in 2007-08. India is one of the most successful developing countries in terms of a vibrant market for exchange-traded derivatives. This reiterates the strengths of the modern development of India's securities markets, which are based on nationwide market access, anonymous safe and secure electronic trading, and a predominantly retail market. There is an increasing sense that the equity derivatives market is playing a major role in shaping price discovery. Factors like increased volatility in financial asset prices; growing integration of national financial markets with international markets; development of more sophisticated risk management tools; wider choices of risk management strategies to economic agents and innovations in financial engineering, have been driving the growth of financial derivatives worldwide and have also fuelled the growth of derivatives here, in India. There is no better way to highlight the significance and contribution of derivatives but the comments of the longest serving Governor of Federal Reserve, Alan Greenspan: "Although the benefits and costs of derivatives remain the subject of spirited debate, the performance of the economy and the financial system in recent years suggests that those benefits have materially exceeded the costs.

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RBI's Revised PCA Framework for Ailing Banks

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Abstract

Banking and financial institutions in the country play multiple and pivotal roles, and contribute substantially for the overall development of the economy. In spite of this pivotal role that these banking institutions are playing, their financial performance is not satisfactory. One of the indicators of this not-so satisfactory performance is the mounting non-performing loans (NPLs). This is adversely affecting their performance from the points of view of other indicators such as capital adequacy, return on assets, etc. This NPL has, therefore, become a big challenge for the bankers and also to the government. To resolve this problem of mounting NPLs of banks, the Reserve Bank of India (RBI) and the Government of India (GOI) have taken many a number of steps. However, these measures have not yielded the desired result and the problem remain unresolved. Hence, the apex bank of the country revised its earlier scheme viz., Prompt Corrective Action (PCA) Framework of 2002 thoroughly and issued the Revised PCA Framework in April 2017 identifying the key performance areas, parameters to measure the performance of banks in each of these key areas, Risk Thresholds for each performance indicator and also the corrective actions required to be taken by the banks if their performance breach the Risk Thresholds. In this background, this paper makes an attempt examine the problem together with other related issues followed by an analysis of different aspects of Revised PCA Framework, 2017.

Key Words/Terms: Asset Quality, CAR, CET - 1 Ratio, CRAR, Net NPA Ratio, Prompt Corrective Action, Return on Assets Ratio, Risk Thresholds, Tier - I and II Capital

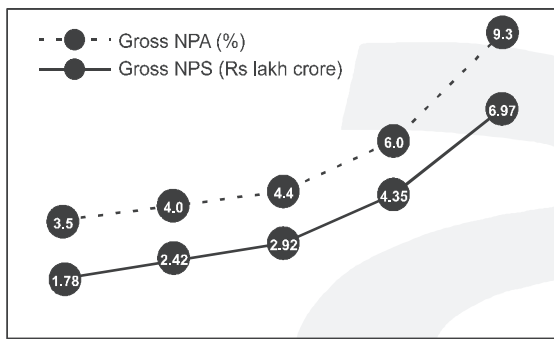
Introduction

Banking and financial institutions play a stupendous role in the overall development of the economy. This is true even in the case of Indian banking and financial institutions. They provide profitable and secured avenues for the general public to park their surplus fund, and also provide loans and advances to those who are in need of fund including the economic entities. On the public deposits, the banking and financial institutions pay interest at the agreed rate periodically which is inescapable. On the other hand, on the loans and advances, they earn interest income which is, in some cases, uncertain. Besides uncertain interest income, there is also an uncertainty about receiving back the amount lent in accordance with the payment schedule. This uncertainty with regard to both the interest income and the receipt of principal loan amount is leading to a number of problems to the lending bankers. These problems are leading to deterioration in the asset quality, curtailment of fund for further lending, reduction in the Capital Adequacy Ratio, decline in the interest income, reduction in the spread, reduction in the rate of return on assets, etc. All these problems, in one way or the other, are centered around non-performing loans/assets (NPLs/NPAs) and this NPA has become a very big challenge not only to banking organizations in the country but

also for the higher authorities including the apex bank and the government.

NPAs - A Few Statistics

Public sector banks (PSBs) in India are struggling hard with NPAs/bad loans amounting to little over ₹ 6 lakh crore. Bad loans increased by over ₹ 1 lakh crore in the first nine months of the last fiscal to ₹ 6.07 lakh crore by 31 December 2016. The gross NPAs of these banks stood at ₹ 5.02 lakh crores at 31 March 2016 and at ₹ 2.67 lakh crore at the end of 2014-15 financial year. Further, the NPAs of banks have increased to ₹ 6.15 lakh crore by the end of February 2017. A few more relevant statistics pertaining to the NPAs of Indian banks are presented in the following graph (Figure - 1).



31-12-2012 31-12-2013 31-12-2014 31-12-2015 31-12-2016
Figure -1 Gross NPA

It is obvious from the above that both the amount and the ratio of Gross NPA of Indian banks have been increasing year after year continuously which should be a matter of great concern for all stakeholders. A recent annual report of the United Nations Economic and Social Commission for Asia and Pacific observes that the country (i.e., India) faced immense risks from concentration of bad loans in PSBs. This is another indication of the gravity of the problem. The core problem of NPAs is with a very few large corporate borrowers (predominantly in infrastructure, power, steel and textile sectors). These corporate giants borrowed huge sums from the banks to expand their capacity during the boom period, 2003-08, but failed to

face the onslaught of global financial crisis. As a result, there has been a slow-down in the operations of these corporate-borrowers leading to default in their payment schedule to lending banks. These corporate defaults are resulting in mounting NPAs of banks. As stated by Sri Chaudhary Birendra, the Minister of Steel, in the Lok Sabha recently, Indian Steel Sector owes about ₹ 3 lakh crore to banks. Further, as Sri Arun Jaitley, the Finance Minister, said in the Lok Sabha recently, top 20 NPAs account for ₹ 1.54 lakh crore. According to the Financial Stability Report (December 2016) of the Reserve Bank of India (RBI, apex bank), the large borrowers (i.e., the debtors to whom the lenders have an exposure of at least ₹ 5 crore each) account for 56 per cent of banks' debt but 88 per cent of their NPAs! It is, therefore, expected that if the banks recover the amounts due from their 40 - 50 large corporate borrowers, it would reduce the banks' NPAs substantially and this will be a great relief not only to the banks but also for the country's economy. However, all these statistics clearly demonstrate the severity of NPA problem of banks including PSBs and SCBs (Scheduled Commercial Banks).

To address this mounting and challenging NPA problem of banks, both the Government of India (GOI) and the RBI have taken many a number of steps/actions in the form of issue of guidelines and directives to the banks, formulation of schemes, etc. And the recent one is the issue of Revised Prompt Corrective Action Framework (Revised PCA Framework) for banks by the RBI on 13 April 2017. In this background, this paper makes an endeavour to examine different dimensions of the Revised PCA Framework issued by the RBI.

Conceptual Framework

The Revised PCA Framework uses certain terms and parameters whose meanings are specific and not similar to those used in rest of the corporate world. Hence, an attempt is made here to present four important indicators/concepts in the right perspective before taking up the RBI's Revised PCA Framework for analysis.

The financial performance of any bank depends, to a greater extent, on its performance in at least four important key areas viz., capital adequacy, asset quality, profitability, and leverage. The performance of a bank with regard to each of these key areas is measured and indicated by CRAR/Common Equity Tier - I Ratio, Net NPA Ratio, Return on Assets (RoA) Ratio, and Tier - I Leverage Ratio respectively.

One of the four key areas is the Capital Adequacy and this is measured by CRAR/Common Equity Tier - I Ratio. CRAR is the acronym for the Capital to Risk Weighted Assets Ratio or Capital Adequacy Ratio (CAR) which considers both Tier - I and Tier - II capital. On the other hand, the Common Equity Tier - I Ratio (CET - I Ratio) is a part of CRAR as it (CET - I Ratio) represents the percentage of Core Equity Capital (net of Regulatory Adjustments) to Total Risk Weighted Assets. However, on the basis of the degree of contribution to capital from the owners (i.e., shareholders), capital is classified into two broad categories as Tier - I Capital and Tier - II Capital.

1) Tier - I Capital, as specified by the RBI, refers to one of the components of regulatory capital comprising share capital and disclosed reserves (less, goodwill, if any). And the major portion of Tier - I Capital (also called, **Core Capital**) is, usually, in the form of equity capital. Therefore, the items of Tier - I Capital are deemed to be of highest quality as they are available fully to cover losses. Anyhow, Tier - I Capital is equivalent to the aggregate of (i) Common Equity Tier - I and (ii) Additional Tier - I.

2) Tier - II Capital, also known as **supplementary capital**, refers to one of the components of regulatory capital (i.e., qualifying as regulatory capital to the extent that they can be used to absorb losses arising from the activities of banks). However, the loss absorption capacity of Tier - II Capital is lower than that of Tier - I Capital as it is more in the form of reserves, debts, etc. However, it comprises certain reserves and certain types of **subordinated debt** [i.e., the debt which has

only a secondary claim on repayments (after other debts have been repaid) in the event of bankruptcy/liquidation of the debtor].

3) Risk-Weighted Asset represents the product of notional amount of the asset (i.e., mostly, loans) and risk assigned to that asset. It may be noted here that the '**risk weight**' differs from one asset to another e.g., risk weight assigned to (i) each of cash in hand and balance with the RBI is '0' (zero), (ii) balances in current accounts of other banks is 0.2 (i.e., 20%), (iii) loans granted to public sector undertakings (PSUs) of either GOI or state governments is '1' (i.e., 100 per cent), (iv) investments in venture capital funds is 1.5 (i.e., 150%), etc. These weights are determined and assigned in accordance with the Basel Committee guidance for assets of each credit rating slab.

Using the above variables, CAR/CRAR is computed by dividing the capital of the bank by the aggregated risk weighted assets for credit risk, market risk and operational risk as follows.

$$\text{CAR or CRAR} = \left[\frac{\text{Tier - I Capital} + \text{Tier - II Capital}}{\text{Risk Weighted Assets or Exposures}} \times 100 \right]$$

This Ratio measures the capital adequacy in terms of riskiness of the loans/assets. The apex bodies specify the minimum amount of capital a bank has to hold given the size of its risk-weighted assets. For example, if the CRAR is specified at 9 per cent, then the bank has to back every ₹ 100 of commercial loans with ₹ 9 of capital. Therefore, 'higher the loan assets, higher should be the capital of the bank'. This also means that 'higher the CRAR of a bank, the better capitalized it is'. Further, the Revised PCA Framework requires the Capital Conservation Buffer (CCB) i.e., building up of capital buffers by the banking institutions outside periods of stress which can be drawn down as losses are incurred.

The second key area is the asset quality and it is reflected by the Net NPA Ratio. This Ratio (also called, Net Non-performing Advances Ratio) is computed by dividing the amount of Net NPA by

the amount of Net Advances and usually, it is expressed in terms of percentage as presented below.

$$\text{Net NPA Ratio} = \left[\frac{\text{Amount of Net NPA}}{\text{Amount of Net Advances}} \times 100 \right]$$

Therefore, two variables viz., the amount of Net NPA and the amount of Net Advances need some description. When an asset, including a leased asset, ceases to generate income for the bank, it is reckoned as gross non-performing asset (Gross NPA). On the other hand, Net NPA represents the excess of Gross NPA over the aggregate of (i) total provisions held, (ii) part payment received and kept in suspense account, (iii) balance in Interest Suspense Account, and (iv) DICGC (Deposit Insurance and Credit Guarantee Corporation)/ECGC (Export Credit Guarantee Corporation) claims received and held pending adjustment. That means,

$$\text{Net Non-performing Asset} = \left[\text{Gross Non-performing Asset} \right] - \left[\text{Total Provisions Held} + \text{Total Payment in Suspense Account} + \text{Balance in Interest Suspense Account} + \text{DICGC/ECGC Claims Received but pending Adjustment} \right]$$

On the other hand, the amount of **Net Advances** represents the difference between the gross advances and repayments of principal received as presented below.

$$\text{Net Advances} = \left[\text{Gross Advances} \right] - \left[\text{Repayments of Principal} \right]$$

The third key area is the profitability and it is indicated by, among others, **Return on Assets Ratio**. This Ratio establishes the meaningful relationship between the amount of Profit after Tax and the amount of Average Total Assets. It is also expressed in the form of percentage as presented below.

$$\text{Return on Assets Ratio} = \left[\frac{\text{Amount of Net Profit}}{\text{Amount of Average Total Assets}} \times 100 \right]$$

The numerator of the above formula viz., Net Profit is influenced by a few more variables such as Profit before Tax, Provision for Tax, Realized Gains or Losses on Sale of Assets, Net Operating Profit, etc. However, the amount of **Net Profit**

represents the difference between Profit before Tax and the Provision for Tax.

$$\text{Net Profit (i.e., after Tax)} = \left[\frac{\text{Profit before Tax}}{\text{Tax}} \right] - \left[\frac{\text{Provision for Tax}}{\text{Tax}} \right]$$

It may be noted here that the amount of **Profit before Tax** is computed by adding realized gains or subtracting losses on sale of assets to/from the Net Operating Profit.

$$\text{Profit before Tax} = \left[\frac{\text{Net Operating Profit}}{\text{Profit}} \right] \pm \left[\frac{\text{Realized Gains or Losses on Sale of Assets}}{\text{on Sale of Assets}} \right]$$

And **Net Operating Profit** represents the excess of Operating Profit before Provision over the aggregate of (i) Provision for Loan Losses, (ii) Depreciation in Investments, and (iii) Write-offs and Other Provisions.

$$\text{Net Operating Profit} = \left[\frac{\text{Operating Profit before Provisions}}{\text{before Provisions}} \right] - \left[\frac{\text{Provision for Loan Losses} + \text{Depreciation in Investments} + \text{Write-offs and other Provisions}}{\text{Losses Investments Provisions}} \right]$$

The difference between Total Income and Total Operating Expenses represents the Operating Profit before Provisions.

$$\text{Operating Profit before Provisions} = \left[\frac{\text{Total Income}}{\text{Income}} \right] - \left[\frac{\text{Total Operating Expenses}}{\text{Expenses}} \right]$$

The fourth key area is the Leverage and it is indicated by the Leverage Ratio which is computed as below.

$$\text{Leverage Ratio} = \left[\frac{\text{Capital Measure}}{\text{Exposure Measure}} \times 100 \right]$$

This is a simple, transparent and non-risk based Leverage Ratio calibrated to act as a credible supplementary measure to the risk-based capital requirements.

In the light of the above conceptual framework, further analysis is made in the following paragraphs.

Review of Literature

For the purpose of improving their efficiency, it is necessary for the banks to improve their asset quality which depends upon the recovery of loans. This is because of the reason that any upsurge in the over-dues results in high level of

NPAs leading to deterioration in the asset quality which in turn reduces further the lending capacity of banks. This results in the attenuation of funds for developmental activities. Therefore, both the GOI and the RBI have made attempts to control the NPAs. Unfortunately, the commercial banks have not been able to resolve the issue of NPAs (Monika Kashyap, 2014).

There are evidences to show the substantial increase in the NPA Ratio of Indian banks attributed to the introduction of fair value accounting of banks' assets. And it is more likely to spread to the banking organizations which are inherently weak with regard to capital adequacy, etc (Subramanyam M, May 2012). In order to address the NPAs of banks and to restructure corporate debts in India, forensic auditing strategy is also suggested. Even the apex bank encourages the banks to use this strategy to investigate money laundering allegations and also the companies involved with high-profile default such as Bhushan Steel Ltd., Kingfisher Airlines Ltd., etc (FRPT- Finance Snapshot, 10 December 2014).

When a borrower fails to meet his obligation or defaults on his commitment, credit risk arises. And the increase in credit risk is a symptom of financial crisis in the banking sector. Increasing risk of default requires increase in equity of commercial banks as per Basel - III which is very difficult for the small- and medium-sized banks in the short time. Therefore, the requirement of Basel - III has forced the banks (in Katowice) to limit their active operations i.e., reducing lending and sale of treasury bonds of countries with a low credit rating (Joanna Cichorska, 2014).

Though the Chinese authorities have introduced substantial capital into the banking system for the purpose of lowering the high level of NPLs, the results support the moral hazard hypothesis suggesting that an increase in the NPL Ratio enhancing riskier lending causing further deterioration in loan quality and financial system instability (Dayong Zhang, Jing Cai, David G Dickinson & Ali M Kutan, February 2016).

Regulators and the financial institutions in the US and other countries have taken many steps to address the problem of persistent troubled assets on their banks' balance sheets. These measures include, among others, the announcement of asset guarantee schemes by the governments. A few countries have also initiated the process of selling the troubled assets, and the third approach is the formation of 'bad banks' enabling the banking and financial institutions to sell their troubled assets into a new entity i.e., bad banks (Anna T Pinedo, September 2009). An analysis of a few US-based systemically important financial institutions covering a period of 10 years from 2000 to 2010 reiterated the fact that NPAs and operating efficiency are significant determinants. However, Tier - I Capital Ratio is not a significant indicator of default risk (Natalya A. Schenck, 2014).

An evaluation, using the Panel VAR Methods, of sensitivity of NPLs to shocks of six industries in Barbados (viz., agriculture and fishing, construction, distribution, manufacturing, mining and quarrying, and professional services and tourism) has revealed some degree of heterogeneity in the response of NPLs to these shocks? No evidence to suggest that shocks to the agriculture and manufacturing sectors (two small sectors) affect NPLs; and the positive shocks to the output of distribution, and professional services and tourism resulting in the overall decline in the level of stress in the financial system (Anton Belgrave, Kester Guy & Mahalia Jackman, December 2012).

An analysis of profitability of 16 Indian banks was found to be reasonable during 2000-01 - 2006-07 when compared to the previous years. Return on Investment, overall profitability indicator, was at a moderate rate. With regard to Debt-Equity position, these banks maintained 1:1 ratio though it was very high for some period. Though Capital Adequacy Ratio was constant, Interest Coverage Ratio registered a continuous increase. It was found that Return on New Worth had a negative correlation with the Debt-Equity Ratio. Besides, Interest Income to Working Funds also had a negative association with the Interest Coverage Ratio. Further, NPAs to Net Advances

was negatively correlated with the Interest Coverage Ratio (Harish Kumar Singla, February 2008). The change in profit is usually attributed to changes in revenue (desirable outputs) and cost i.e., risk and inputs (Jia-Ching Juo, April 2014). Further, weaknesses in the performance of banking and financial institutions can be measured with the help of return on average assets, NPLs, and equity to assets (James B Bexley & Jonathan Breazeale, Winter 2012).

Profitability of banks, as in any other sector, depends upon their volume of performing assets, customer orientation, operational efficiency, optimal level of operation, etc. Another crucial determinant is their ability to build up large volumes of quality assets while complying with the prudential norms. Besides, productivity and efficiency play a vital role in the banking industry. Continuous up-gradation at all levels, and commitment to the vision and mission of banks require the attention of banks in future, and in all likelihood, only those banks which are proactive responding quickly to the changing needs of customers with due attention for the changing scenario will survive and prosper in this competitive world (Vibha Jain (2007)).

On the lines of the above, there are many more studies undertaken by the researchers in the past on different aspects of performance evaluation of banking institutions including the management of NPAs. However, the above analysis brings the point to the fore that capital adequacy, asset quality and profitability are vital areas wherein the banks have to focus to improve their CAR/CRAR, to lower their Net NPA Ratio and to maximize their RoA Ratio (Figure - 2).

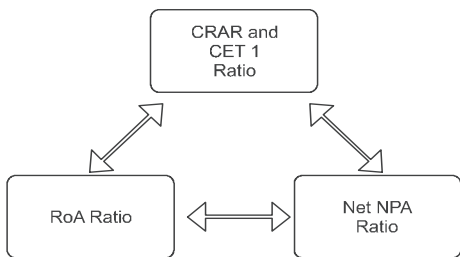


Figure - 2: Inter-relationship among Financial Performance Indicators

The success of banks in the areas of capital adequacy and profitability depend upon how effectively they manage their NPA to lower their NPA. This highlights the need for, and importance of, reducing the NPAs. In order to combat the mounting menace of NPL/NPA, the Indian regulatory authorities have initiated a few measures which are summarized below.

Measures for addressing NPA Menace

Both the RBI and the GOI have formulated and introduced a few schemes to address and resolve the problem of NPAs. These include, among others, the following (Inchara P M Gowda & Manjunatha K R, March 2017).

(1) SARFAESI Act, 2002 (The Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002) has been enacted with the objective of speeding up the recovery process and to empower the lending banks/financial institutions to recover their NPAs without the intervention of courts. To strengthen the hands of the lending banks, the Act provides two alternative mechanisms viz.,

- (a) Securitization empowering the secured creditors to take possession of the securities offered by the borrowers if they fail to adhere to the payment schedule and to sell such securities for recovering their loan.
- (b) Setting up of Securitization/ Reconstruction Companies (SCs/RCS) to acquire the NPAs from the banks thereby cleaning the banks' balance sheets and enabling them to concentrate on their primary business. Further, the Act empowers the SCs/RCS to take possession of the secured assets of borrowers including right to transfer and realize the secured assets.

(2) Establishment of 33 Debts Recovery Tribunals (DRTs) and 5 Debts Recovery Appellate Tribunals (DRTs) by the GOI (under the Provisions of Recovery of Debts Due to

Banks and Financial Institutions Act, 1993) for the speedy adjudication and recovery of debts due to banking institutions (with outstanding amount of ` 10 lakh and above).

(3) Lok Adalats is an alternative disputes resolution (ADR) mechanism enabling the expeditious, in-expensive and mutually acceptable means of settling the disputes between the lending banks and borrowing parties.

(4) RBI's Schemes: For the purpose of enabling the banks to resolve the problem of their stressed assets, the RBI has designed and introduced a few schemes. These include the following, among others.

(a) Joint Lenders' Forum (JLF) to empower the smaller lender-banks,

(b) Corporate Debt Restructuring (CDR, 2001) enabling the banks to help the ailing corporates with additional funds based on majority decision,

(c) Strategic Debt Restructuring (SDR, 2015) enabling the lender-banks to take control of management and to convert their outstanding loans into majority equity stake,

(d) Flexible refinancing under 5/25 Scheme, etc.

(e) The apex bank has also come out in June 2016 with a new scheme called, Scheme for Sustainable Structuring of Stressed Assets (S4A) as another option for the banks to deal with the stressed assets arising out of their corporate lending.

(5) In the Economic Survey, 2016-17, the GOI mooted the idea of establishing a new central agency called, Public Sector Asset Rehabilitation Agency (PARA) to address the largest and the most difficult cases and to take politically tough decisions to reduce the debt of public sector which in turn enable the banks to reduce their NPAs (Inchara P. M Gowda, March 2017).

However, the outcome of these exercises is not satisfactory as the problem remained unresolved. Hence, the apex bank of the country has issued the Revised Prompt Corrective Action (PCA) Framework requiring the banks to implement the actions specified in the Framework if applicable to them. It may be noted here that the apex bank had issued a similar Framework way back in December 2002 (RBI, 21 December 2002) after considering the suggestions received from the bankers and others, and after its approval by the Board for Financial Supervision (BFS) and the GOI. This earlier Framework (of December 2002) identified the trigger points (i.e., minimum/maximum limit in performance indicator of each key area - causing the initiation of action as stipulated in the Framework if the performance of a bank reached or crossed any of these trigger points), structured actions and discretionary actions. This 2002 PCA Framework made it very clear that, if (i) the CRAR of any SCB falls below 9 per cent or (ii) if its Net NPA Ratio is 10 per cent or more, or (iii) if its ROA falls below 0.25 per cent, then that bank falls within the PCA Framework. Further, within each of the first two minimum/maximum performance indicators (as above), the apex bank made 2 - 3 zones/slabs and the actions (both Structured Actions and Discretionary Actions) differed from one zone/slab (of performance) to another.

Revised PCA Framework, 2017 - Key Areas, Indicators and Risk Thresholds

The apex bank reviewed and revised the existing 2002 PCA Framework, and the Revised PCA Framework has been issued on 13 April 2017 (RBI, 13 April 2017). The salient features of the Revised PCA Framework are presented below. The apex bank has stipulated the minimum/maximum limit for each performance indicator. If the performance of any bank falls below this minimum limit or exceeds the maximum limit, then the bank will fall within the scope of Revised PCA Framework.

(1) Capital Adequacy - Indicators and Risk Thresholds: As far as the Capital Adequacy is concerned, the Revised PCA Framework

uses two indicators and 2 - 3 Risk Thresholds. The two indicators are CRAR and CET - 1 Ratio. In the case of CRAR, the minimum ratio is 10.25% (i.e., 9% Minimum Total Capital + 1.25% of CCB)¹. And it is 6.75% in the case of CET - 1 Ratio. If the CRAR is less than 10.25% and/or if the CET - 1 is less than 6.75%, it triggers the Revised PCA. That means, if the CRAR is 10.25% or more, and CET - 1 is 6.75% or more, it does not trigger the Revised PCA. Within this minimum capital requirement, the Framework identifies 2 - 3 Risk Thresholds as detailed below.

- (a) Risk Threshold - 1: CRAR is $\geq 7.75\%$ but $< 10.25\%$ (i.e., up to 250 bps² below indicator) and/or CET - 1 Ratio is $\geq 5.125\%$ but $< 6.75\%$ (i.e., up to 162.50 bps below indicator).
- (b) Risk Threshold - 2: CRAR is $\geq 6.25\%$ but $< 7.75\%$ (i.e., more than 250 bps but not exceeding 400 bps below indicator) and/or CET - 1 Ratio $\geq 3.625\%$ but $< 5.125\%$ (i.e., more than 162.50 bps but not exceeding 312.50 bps below indicator).
- (c) Risk Threshold - 3: CET - 1 is less than 3.625 per cent.

(2) Asset Quality- Indicators and Risk Thresholds: For the purpose of evaluating the asset quality, Net Non-performing Advances³ Ratio is used. In the earlier PCA Framework (2002), only two zones were used viz., Net NPA Ratio is $> 10\%$ but $< 15\%$, and $\geq 15\%$. That means, if the Net NPA Ratio of a bank is 10 per cent or less, it does not trigger PCA. All other banks whose Net NPA Ratios were higher than 10 per cent attracted PCA. But now, in the Revised PCA Framework, the apex bank made two important changes - (i) increase the number of zones to three as Risk Thresholds - 1, 2 and 3, and (ii) reducing the minimum trigger point from greater than 10 per cent to 6 per cent as detailed below.

- (a) Risk Threshold - 1: Net NPA Ratio is $\geq 6\%$ but $< 9\%$.
- (b) Risk Threshold - 2: Net NPA Ratio is $\geq 9\%$ but $< 12\%$.
- (c) Risk Threshold - 3: Net NPA Ratio is $\geq 12\%$.

(3) Profitability- Indicators and Risk Thresholds:

As far as the measurement of profitability is concerned, there is no change in the indicator as the RoA continues to be the yardstick to measure the profitability. However, the Revised PCA Framework has created three Risk Thresholds - 1, 2 and 3 as against only one trigger point in the 2002 PCA Framework. Further, the Revised PCA Framework has done away with < 0.25 per cent limit (used in the 2002 PCA Framework) as evident from the following.

- (a) Risk Threshold - 1: Negative ROA for two consecutive years
- (b) Risk Threshold - 2: Negative ROA for three consecutive years
- (c) Risk Threshold - 3: Negative ROA for four consecutive years

(4) Leverage- Indicators and Risk Thresholds:

This is an additional key area used by the apex bank in the Revised PCA Framework and to assess the performance of a bank from the point of view of Leverage, Tier - 1 Leverage Ratio (i.e., the percentage of Capital Measure to Exposure Measure) is specified. In this regard, the Revised PCA Framework uses two Risk Thresholds - 1 and 2 as detailed below.

- (a) Risk Threshold - 1: Tier - 1 Leverage Ratio is $\leq 4.0\%$ but $\geq 3.5\%$ (i.e., leverage is over 25 times the Tier - 1 Capital)
- (b) Risk Threshold - 2: Tier - 1 Leverage Ratio is $< 3.5\%$ (i.e., leverage is over 28.6 times the Tier - 1 Capital)

It may be noted from the above that higher the zone/Risk Threshold Number, higher is the gravity of the problem requiring more stringent actions as evident from the following.

Revised PCA Framework, 2017 -Corrective Actions

As far as the prompt corrective actions are concerned, the apex bank has made certain

changes in the Revised PCA Framework as compared to the 2002 PCA Framework. One is the restructuring of 'Structured Actions' as 'Mandatory Actions'. These Mandatory Actions are common for all key areas and performance indicators. However, the mandatory actions differ from one Risk Threshold to another. The second important change is in 'Discretionary Actions'. The Revised PCA Framework specifies 'common menu' for selection of discretionary corrective actions. It may be noted here that the Revised PCA Framework applies to all banks operating in India on breach of Risk Thresholds of identified indicators. These banks include even the small banks, and branches and subsidiaries of foreign banks.

Further, a bank will be placed under the Revised PCA Framework based on its audited annual financial results and the supervisory assessment made by the apex bank. Besides, the apex bank is empowered to impose the Revised PCA Framework on any bank during the course of a year (including migration from one Threshold to another) if the circumstances warrant. The Provisions of this Revised PCA Framework will be effective from 1 April 2017 based on the financial results of the banks for the year ended 31 March 2017. And these Provisions will be in force for a period of three years from 1 April 2017 and the apex bank intends to review the same after three years.

In the light of the above, the prescribed actions - both Mandatory and Discretionary - are presented below. It may be noted here that, besides the corrective actions prescribed below, the Revised PCA Framework does not preclude the apex bank from taking any other action as it deems fit.

(1) Mandatory Actions: As already pointed out, these actions are common for all banks which trigger PCA. Further, all mandatory actions specified for Risk Threshold - 1 are applicable even for the subsequent Thresholds - 2 and 3 but not vice-versa. The Revised PCA Framework prescribes the following mandatory actions for different Risk

Thresholds. Hence, the banks which fall within the Revised PCA Framework have no other option except implementing these mandatory actions fully and with all seriousness.

- (a) Risk Thresholds - 1, 2 and 3: Any bank which breaches either CRAR or CET - 1 Ratio or Net NPA Ratio or RoA Ratio or Leverage Ratio or any combination of these Ratios is subject to restriction on dividend distribution/remittance of profits. Further, the Promoters/owners/parent in the case of foreign banks are required to bring in capital.
- (b) Risk Threshold - 2: Additionally, the banks are subject to restriction on branch expansion - domestic and/or overseas (this action is also applicable to Risk Threshold - 3). Further, the banks are required to make higher provisions as part of the coverage regime.
- (c) Risk Threshold - 2: Additional action is the restriction on management compensation and directors' fees, as applicable.

These actions aim at improving the CRAR and ROA Ratio, and reducing the Net NPA Ratio by increasing the capital base, reducing expenses and appropriations, etc.

(2) Discretionary Actions: The Revised PCA Framework prescribes a common menu with specified actions for each of nine specific issue areas, and from this common menu, the relevant corrective actions are required to be chosen and executed depending upon the area wherein the performance of a bank triggers actions. The nine broad areas and the corrective actions prescribed are summarized below.

- (a) **Special Supervisory Interactions** comprise (i) Special Supervisory Monitoring Meetings (SSMMs) at quarterly or other identified frequency, (ii) special inspections/targeted scrutiny of the bank, and (iii) special audit of the bank.

- (b) **Strategy-related Actions:** The apex bank to advise the bank's Board to (i) activate the Recovery Plan, (ii) undertake a detailed review of business model in terms of sustainability of the business model, profitability of business lines, medium- and long-term viability, etc., (iii) review short- and medium-term strategies addressing immediate concerns, identifying achievable targets and setting concrete milestones for progress and achievement, etc., (iv) undertake business process reengineering and restructuring of operations as appropriate.
- (c) **Governance related Actions:** The apex bank (i) to actively engage with the bank's Board on various aspects, (ii) to recommend to owners to bring in new management/Board, (iii) to remove managerial persons, (iv) to supersede the Board or to recommend supersession of the Board as applicable, etc.
- (d) **Capital related Actions:** (i) Detailed Board level review of capital planning, (ii) submission of plans and proposals for raising additional capital, (iii) requiring the bank to bolster reserves through retained profits, (iv) restriction on investment in subsidiaries/associates, expansion of high risk-weighted assets to conserve capital, (v) reduction in exposure to high risk sectors to conserve capital, etc., are some of the actions prescribed by the apex bank to tackle capital related issues.
- (e) **Credit Risk related Actions:** (i) Preparation of time bound plan and commitment for reduction of stock of NPAs and for containing generation of fresh NPAs, (ii) strengthening of loan review mechanism, (iii) restrictions on/reduction in credit expansion for borrowers below certain rating grades and for unrated borrowers, (iv) reduction in loan concentrations, (v) sale of assets, (vi) setting up of dedicated Recovery Task

Forces, Adalats, etc., are some of the actions listed in the common menu of Revised PCA Framework for managing credit risk.

- (f) **Market Risk related Actions** comprise restrictions on/reduction in borrowings from the inter-bank market, restrictions on accessing/renewing wholesale deposits/costly deposits/certificates of deposits, restrictions on derivative activities, restriction on excess maintenance of collateral, etc.
- (g) **HR related Actions** comprise restriction on staff expansion, and review of specialized training needs of existing staff.
- (h) **Profitability related Actions** consist of restrictions on capital expenditure, other than for technological upgradation within Board approved limits.
- (i) **Operations related Actions:** (i) Restrictions on branch expansion plans, (ii) reduction in business at overseas branches/subsidiaries/ in other entities, (iii) restrictions on entering into new lines of business, (iv) reduction in leverage through reduction in non-fund based business, (v) reduction in risky assets, (vi) restrictions on non-credit asset creation, etc., are the important prescriptions for operations-related issues.

The above are the actions prescribed by the RBI for the banks which, because of poor performance, trigger the Revised PCA Framework. It may be noted here that the apex bank is empowered to take any other specific action that it may deem fit considering specific circumstances of a bank.

PCA Framework, 2002 Vs 2017 - A Few Differences

A comparison of the Revised PCA Framework of 2017 with that of December 2002 reveals certain differences in terms of prescribed actions, key areas, min/max performance results attracting the Provisions of PCA Framework, etc. However,

an attempt is made here to analyze and present only a few differences.

- (1) In the case of Asset Quality which is measured with the help of Net NPA Ratio, the 2002 PCA Framework made only two zones viz., (i) $>10\%$ but $<15\%$, and (ii) $\geq 15\%$. But in the Revised PCA Framework of 2017, the apex bank made three zones and also reduced upper limit of the last zone (Risk Threshold - 3). Further, instead of 'trigger points', the apex bank uses 'Risk Thresholds' now. And the three zones, in the case of Net NPA Ratio, are (i) $\geq 6\%$ but $< 9\%$, (ii) $\geq 9\%$ but $< 12\%$, and (iii) $\geq 12\%$. Similar differences can be found even in other key areas, performance indicators and the risk thresholds.
- (2) In the earlier PCA Framework, only three key areas and their performance indicators were used to ascertain whether a bank falls within the PCA Framework or not. They are, Capital Adequacy (CRAR/CET - 1 Ratio), Asset Quality (Net NPA Ratio) and Profitability (ROA Ratio). But in the Revised PCA Framework, one more key area viz., Leverage is included and to measure the performance of the banks from the point of view of Leverage, Tier - 1 Leverage Ratio is used.
- (3) In the 2002 PCA Framework, the apex bank stipulated both the Structured Actions and Discretionary Actions for each of the Key Areas and Trigger Points separately. But in the Revised PCA Framework, there are Mandatory Actions (in place of Structured Actions) for each of the three Thresholds and these Actions are common for all the four Key Areas. And the Common Menu for selection of Discretionary Corrective Actions is specified, in the Revised PCA Framework, for all Key Areas. And this Common Menu is related to nine specific areas such as supervisory, governance, credit risk, profitability, operations, etc.

On the lines of the above, there are a few more differences between the PCA Framework of 2002 and the Revised PCA Framework of 2017.

Conclusion

The apex bank, through the issue of Revised PCA Framework (April 2017), has made another attempt to address the NPA problem of Indian banks. It has tightened the Risk Thresholds and therefore, it is expected that more than half of PSBs would breach at least one of the new Risk Thresholds owing to high level of NPAs, and it may be noted here that if any bank fails to meet the requirements in any of these indicators or Risk Thresholds will lead to initiation of action by the apex bank on the banks concerned such as stricter norms on lending, restriction on branch expansion, change of management, merger, etc. This is because of the reason that the breach of any Risk Threshold would result in the invocation of Revised PCA. These stringent measures are expected to address the NPA problem of banks vigorously. However, one should not forget the fact that a similar scheme (i.e., PCA Framework, 2002) has been in vogue since December 2002 but the NPA problem remained unresolved. It is hoped that based on the experience with the PCA Framework, 2002, the banks, apex bank and the GOI will implement the Provisions of Revised PCA Framework, 2017 effectively to improve the performance and to reduce the NPAs of banks if they breach the Risk Thresholds. However, the primary task for all banks is to work efficiently and profitably, and to see that they do not attract the actions under Revised PCA Framework, 2017.

Notes

- (1) The Capital Conservation Buffer (CCB) is required to be increased to 1.875 per cent by 31 March 2018 and to 2.5 per cent by 31 March 2019.
- (2) 'bps' is used to measure the change in the (interest) rate/yield. And '1' basis point (i.e., '1' bps) means 0.01 per cent (i.e., one-hundredth of one per cent).
- (3) The Revised PCA Framework uses the term 'Net Non-performing Advances'. However, the meaning is same as that of Net Non-performing Loans or Net Non-performing Assets.

(4) In 2002 PCA Framework, both the Structured and Discretionary Actions were specified for each key area, for each performance indicator and for each trigger points separately.

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Abstract

The introduction of currency derivatives in India was done a decade back and from then on there have been many changes that have been implemented in the trading system in this regard. The paper gives a glimpse of derivatives in general and currency derivatives in particular. It aims to assess the development of currency derivatives in India. To study the growth of the currency derivatives, the number of contracts traded, trading volume and open interest at NSE are studied. The period of study conducted is from 2008-2009 to 2016-17. It is hoped that the currency derivatives market will develop faster and it will be a good choice for all the market participants in the near future and it will find its way in the Indian economy. This paper also explores the factors which determine the usage of currency derivatives by Indian Companies. One of the objectives is to know the development patterns of currency derivatives in India with respect to National Stock Exchange (NSE).

Keywords: currency futures, currency options, open interest, volume traded.

Introduction

Currency derivatives have had a fruitful period in India. Though it took more than three decades from the time currency futures was introduced at CME, to make its mark in Indian trading sector. Today the exchange traded currency segment in India is stable, growing and powered by the increasing involvement of hedgers and other market participants.

Concept of Derivatives

The term 'derivatives', refers to a broad class of financial instruments which mainly include options and futures. These instruments derive their value from the price and other related variables of the underlying asset. They do not have worth of their own and derive their value from the claim they give to their owners to own some other financial assets or security. A simple example of derivative is cocoa butter, which is derivative of cocoa bean. The price of cocoa butter depends upon price of cocoa bean, which in turn depends upon the demand and supply of cocoa bean. The general definition of derivatives means to find the underlying value of an asset. Derivatives can be better understood by dividing into two as a derived function and a derivative instrument. A derived function is the result of mathematical differentiation; the instantaneous change of one quantity relative to another; $df(x)/dx$, while a derivative instrument is a financial instrument whose value is based on another security, (linguistics) a word that is derived from another word; 'electricity' is a derivative of 'electric'. The asset underlying a derivative may be commodity or a financial asset. Derivatives are those financial instruments that derive their value from the other assets. For example, the price of gold to be delivered after two months will depend, among so many things, on the present and expected price of this commodity.

Meaning of Currency Derivative

Currency Derivatives are Future and Options contracts which one can buy or sell specific quantity of a particular currency pair at a future date. It is similar to the Stock Futures and Options but the underlying happens to be currency pair. Currency Pairs are USD-INR, EUR-INR, GBP-INR and JPY-INR (Indian Rupee (INR), US Dollars (USD), Euro (EUR), Great Britain Pound (GBP) and Japanese Yen (JPY)). In other words currency derivatives are complex financial instruments which are traded over-the-counter (OTC) and this is a collective term used for futures, forwards and swaps. Currency derivatives are used for hedging. This hedging involves a future payment or receipt in a foreign currency.

Historical Back Ground of Currency Derivatives

Currency derivative are introduced in The Chicago Mercantile Exchange (CME) in the year of 1972. The FX contract capitalized on the U.S. abandonment of the Bretton woods agreement, which had fixed world exchange rates to a gold standard after World War II. The abandonment of the Bretton woods agreement resulted in currency values being allowed to float increases the risk of doing a business, by creating another market. The concept of Currency at CME was revolutionary, & gained credibility through endorsement of Nobel-prize-winning economist Milton Friedman. CME offered 41 individual FX futures & 31, options contracts on 19 currencies. The traders of CME FX futures are a diverse group that includes multinational corporations, hedge funds, commercial banks, investment banks, financial managers, commodity trading advisors and individual investors. They trade in order to transact business hedge against unfavourable changes in currency rates or to speculate on exchange rate fluctuations.

Types of Currency Derivatives

Currency forwards: A currency forward is an agreement between two parties where both the parties agreed to buy/sell an underlying asset at a predetermined price in future. This involves future payment or receivable an unknown foreign exchange rate.

Currency futures: A futures contract is a standardized contract, traded on an exchange, to buy or sell a certain underlying asset or an instrument at a certain date in the future, at a specified price. When the underlying is an exchange rate, the contract is termed a "currency futures contract".

Currency options: A currency option is a contract giving the option purchaser (the buyer) the right, but not the obligation, to buy or sell a fixed amount of foreign exchange at a fixed price per unit for a specified time period.

Currency swaps: A currency swap is an agreement between two parties to exchange cash flows in two different currencies. The swap consists of interest rate differentials between currencies.

Use of currency derivatives

According to a study conducted on currency derivatives by Manoj Anand, K P Kaushik September, 2008 at IIM-B it was found that most of the firms that use currency derivatives have a clear documented foreign exchange risk management plans, policies or programmes. The study further found that transaction exposure as a foreign currency risk was most critical for the firms, followed by translation exposure and economic exposure. The major objectives of using derivatives were:

- For hedging risk
- Arbitrage and
- Price discovery

Speculation as an objective of using foreign currency derivatives was the least preferred.

To reduce volatility in profits after tax and cash flows' and 'to reduce the cost of capital and thus increase firm value' on one side of the pole and 'to reduce risks faced by management' on the other side of the pole were found to be the major motivations of the firms using foreign currency derivatives in India. Firm characteristics such as high degree of debt ratio and ESOPs usage influence use of foreign currency derivatives in India.

Currency Futures - An alternative to Over-The-Counter

Currency futures market has become an alternative platform for people using the OTC market. The companies having lesser forex requirement does not get limits to book forward contracts or the brokerage charged by banks is very high. Thus these corporates can use currency futures market to hedge their exposures as they can book the smallest amount of say \$1000 in this market and brokerage charged is same irrespective of the amount. One of the disadvantages of OTC market is that the maximum permissible period of booking is 1 month option period. This is mitigated by hedgers by booking their exposure for the first month in currency futures market, roll it over near the month end and cancel the contract on actual delivery to their bank.

Corporates have now found that they can hedge their exposure through currency derivative market, this helps them in availing better prices and they can hedge for smaller quantity with options. Corporates can also use this platform for cost reduction as there is no restriction on plain selling of options in exchange traded derivative segment. Currency Futures and derivatives segment on exchanges have another advantage of less documentation after execution of trades.

Instances such as hiding the trades from top management and blowing out of proportion of hedge books are also prevented due to daily Mark to Market mechanism. Another difficulty with OTC market is that it is completed primarily over the phone. This hinders the execution of deals as there may be congestion of phone lines or non-availability of price in the market. While for Currency Futures and Derivatives segment all exchanges is online system driven hence better execution of trades is possible.

Exchanges have put in place a comprehensive risk management system, which is constantly upgraded to pre-empt market failures. The Clearing Corporation ensures that trading member obligations are commensurate with their net worth. Mark to market margin on daily basis ensures that the client position does not blow out of proportion. NSE is one of the major stock exchanges in India. As mentioned earlier the Indian markets have shown a significant growth both in terms of volumes and numbers of contracts. The equity derivative market in India is expected to grow at an explosive rate in the coming times. NSE alone accounts more than 90% of the derivatives trading in Indian markets. The Currency Derivatives segment at NSE commenced operations on August 29, 2008 with the launch of currency futures trading in US Dollar-India Rupee (USD-INR).

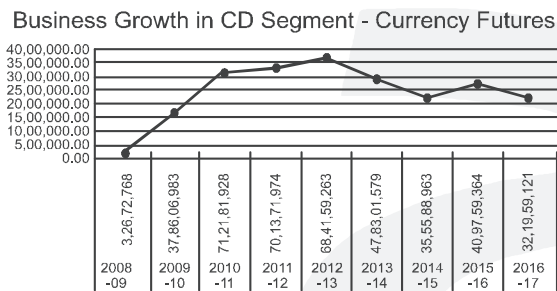
Table-1 Business Growth in CD Segment

Year	Currency Futures		Currency Options	
	No of Contracts	Turnover (in Rs. Cr.)	No of Contracts	Notional Turnover (in Rs. Cr.)
2008-09	3,26,72,768	1,62,272.43	-	-
2009-10	37,86,06,983	17,82,608.04	-	-
2010-11	71,21,81,928	32,79,002.13	3,74,20,147	1,70,785.59
2011-12	70,13,71,974	33,78,488.92	27,19,72,158	12,96,500.98
2012-13	68,41,59,263	37,65,105.33	27,50,84,185	15,09,359.32
2013-14	47,83,01,579	29,40,885.92	18,18,90,951	10,71,627.54
2014-15	35,55,88,963	22,47,992.34	12,50,75,731	7,75,915.32
2015-16	40,97,59,364	27,49,332.96	26,38,23,800	17,52,552.62
2016-17	32,19,59,121	22,17,344.49	30,73,56,564	20,83,898.43

(Source: Compiled from NSE)

The trading activity in currency futures and options has been seeing a bounding growth. Table -1 provides the glimpse of the business growth in CD segment. It can be found that the total turnover of currency futures in the year 2008-09 was Rs 1,62,272.43 crore and increased by 1366.43% to Rs 22,17,344.49 crore in 2016-17. Total number of contracts traded during 2008 -09 were Rs 3,26,72,768 while it was Rs 32,19,59,121 in 2016-17. The total turnover of currency options in the year 2010-11 was Rs 1,70,785.59 crore and increased by 1220.18% to Rs 20,83,898.43 crore in 2016-17. Total number of contracts traded during 2010 -11 were Rs 3,74,20,147 while it was Rs 30,73,56,564 in 2016-17. The average daily turnover during this period for CD is RS 14,609.62 crore.

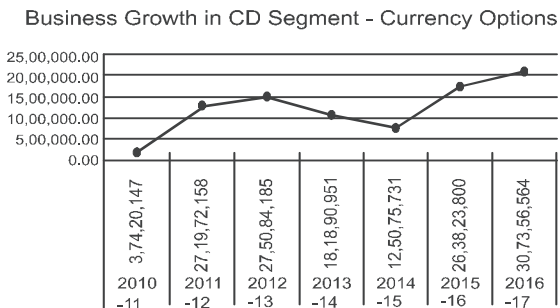
Figure 1



(Source: Compiled from NSE)

The figure-1 represents turnover in crores on vertical axis and number of contracts on horizontal axis. It can be found that there has been period of dips in the currency future traded especially in years 2014-15 and 2016-17.

Figure 2



(Source: Compiled from NSE)

The figure-2 represents turnover in crores on vertical axis and number of contracts on horizontal axis for currency options. There has been a noticeable growth in currency options since last 2 years.

Currency Derivative Trade Statistics for the month of January 2017

The currency pair wise open interest for USD INR is 96.78% with a turnover of 93.34%.

Figure-3

Currency pair wise open Interest

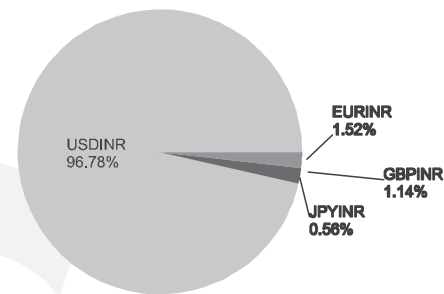
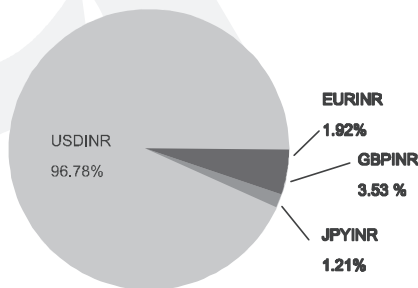


Figure-4

Currency pair wise turnover



(Source: NSE- Market Pulse January 2017)

Open Interest is the total number of outstanding contracts that are held by market participants at the end of the day. It can also be defined as the total number of futures contracts or option contracts that have not yet been exercised, expired, or fulfilled by delivery. Open interest, or the total number of open contracts on a security,

is often used to confirm trends and trend reversals for Futures and Options contracts. Open interest measures the flow of money into the futures market. For each seller of a futures contract there must be a buyer of that contract. Thus a seller and a buyer combine to create only one contract. Therefore, to determine the total open interest for any given market we need only to know the totals from one side or the other, buyers or sellers, not the sum of both. The open interest position that is reported each day represents the increase or decrease in the number of contracts for that day, and it is shown as a positive or negative number.

Table-2 shows the relationship between the price and open interest and the market trend that it follows.

Table-2

Relationship between the price and open interest

Price	Open Interest	Interpretation
Increasing	Increasing	Market is Strong
Increasing	Decreasing	Market is Falling
Decreasing	Increasing	Market is Weak
Decreasing	Decreasing	Market is Improving

(Source: Compiled through various reading material)

Conclusion

Currency derivatives market has now become stable in India. It has started attracting bigger corporates and thus would be seeing increased level of activity. It provides benefits to the participating parties and is here to stay along with the OTC market. Improving the position of currency futures and derivatives market will support Indian Banking System as a risk mitigation tool. Further currency futures market can introduce more currency pairs for other market participants. Currency option market should also introduce option in other cross currencies, this introduction of variety of currencies and contracts will increase the depth and liquidity in this market.

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NSE Market Pulse January 2017

NSE Currency Derivatives Brochure

www.nseindia.com

Credit Management in Cooperative Banks - An Exploratory Study of DCC Bank Shivamogga District

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Abstract

In the new millennium, the co-operatives are to play a pivotal role and act as agencies of economic growth, creating wealth and employment opportunities especially in the rural areas. The United Nations declared 2012 as International Year of Co-operatives. The theme of this year is "Co-operative enterprises help to build a better world". The logo of the International Year of Co-operatives is a cube lifted and supported by seven people. It represents autonomous association of persons united voluntarily to meet their common economic, social, and cultural needs and aspirations through a jointly owned and democratically controlled enterprise. So in this background the current study assume greater importance to study credit management in cooperative banks.

Key words:Credit Management, Cooperative Bank, DCC Bank, Agriculture, Commercial banks

Introduction

A co-operative bank is a financial entity which belongs to its members, who are at the same time the owners and the customers of their bank. Co-operative banks are often created by persons belonging to the same local or professional community or sharing a common interest. Co-operative banks generally provide their members with a wide range of banking and financial services and assistance (loans, deposits, banking accounts etc.). Co-operative banks differ from stockholder banks by their organization, their

goals, their values and their governance. In most of the countries, they are supervised and controlled by banking authorities and have to respect prudential banking regulations, which put them at a level playing field with stockholder banks. Depending on countries, this control and supervision can be implemented directly by state entities or delegated to a co-operative federation or central body. Co-operative banking is retail and commercial banking organized on a co-operative basis. Co-operative banking institutions take deposits and lend money in most parts of the world. Cooperative banking, includes retail banking, as carried out by credit unions, mutual savings and loan associations, building societies and co-operatives, as well as commercial banking services provided by manual organizations (such as co-operative federations) to co-operative businesses.

Rural Cooperative Banking and Credit Institutions play an important role in meeting the growing credit needs of rural India. The volume of credit flowing through these institutions has increased voluminosly. The performance of these institutions, however (apparent in the share of total institutional credit and the indicators of their financial health), has been less than satisfactory and is deteriorating rapidly. Of late, a number of Committees have gone into the reasons for this situation and suggested remedial measures, but there has been little progress in implementing their recommendations for the betterment and improving the current situation.

Credit Management

The word "**credit**" comes from the Latin word "**credo**" which means "**I believe**". Hence, credit is based upon belief, confidence, trust and faith. The loan is based upon the confidence of borrower's future solvency and repayment. Hence, credit means ability to command the other's capital in return for a promise to re-pay at some specified time in future. Besides, credit is the combination of "**ability to borrow**" and "**willingness to borrow**". In fact, credit is an individual's borrowing capacity, often being considered as an "**economic good**" to be produced, managed and marketed.

Credit management is a term used to identify accounting functions usually conducted under the umbrella of accounts receivables. Essentially, this collection of processes involves qualifying the extension of credit to a customer, monitors the reception and logging of payments on outstanding invoices, the initiation of collection procedures, and the resolution of disputes or queries regarding charges on a customer invoice. When functioning efficiently, credit management serves as an excellent way for the business to remain financially stable.

In other words the Credit management is the process of controlling and collecting payments from customers. This is the function within a bank or company to control credit policies that will improve revenues and reduce financial risks.

The process of credit management begins with accurately assessing the credit - worthiness of the customer base. This is particularly important if the company chooses to extend some type of credit line or revolving credit to certain customers. Proper credit management calls for setting specific criteria that a customer must meet before receiving this type of credit arrangement. As part of the evaluation process, credit management also calls for determining the total credit line that will be extended to a given customer.

In spite of this position in 1920-21 and the subsequent onslaughts of the worldwide depression, the Royal Commission on Agriculture

(1928) was encouraged to point out that "experience has amply proved the advantage of this type as a foundation for more ambitious schemes. It affords an excellent training in the handling of money, in expending it on productive purposes, and in the elements that combine to build up sound credit." It frankly admitted that "in the present state of India, the money-lender is a necessity" but emphasized that "the importance of the co-operative movement is accentuated by the comparative failure of legislative measures designed to deal with the problem of indebtedness to achieve their objects." From this emerged its classical warning that "if co-operation fails, there will fail the best hope of rural India." The central banking enquiry committee and the provincial banking enquiry committees which undertook a more elaborate inquiry into the particular problem three years later endorsed the view of the agricultural commission and reiterated its faith in the potentialities by emphasizing that "the greatest hope of the salvation of rural classes from their crushing burden of debt rests in the growth and spread of a healthy and well organized co-operative movement based on the careful education and systematic training of the villagers themselves."

District Central Co-operative Banks (DCCBs): A Special Mention

When the first Co-operative Credit Societies Act was passed in 1904, there was no provision for the formation of DCCBs. But the Act 1912 permitted the organization of higher level federal societies. Before passing this Act of 1912, some Central Co-operative Banks had been established to cater to the financial needs and requirements of the primary societies. They were registered as PACS but were working as Central Co-operative Banks. However with the passing of the Co-operative Societies Act in 1912, District Central Co-operative Banks came to be established on a large scale in the country. The period from 1906 to 1918 may be called as the period of origin of the District Central Co-operative Banks in the country.

The National Bank for Agriculture and Rural Development (NABARD) Act, 1981, provided the following definition of a Central Co-operative Bank: "Central Co-operative Bank means the principal co-operative society in a district of a state, the primary object of which is the financing of other co-operative societies in that district, provided that in addition to such principal society in a district or where there is no such principal society in a district, the State Government may declare any one or more co-operative societies carrying on the business of financing other co-operative societies in that district to be Central Co-operative Bank".

Review of Earlier Work

Ramesha K. (2001) made a study entitled "Credit Risk Management in Agricultural Co-operative Banks" in 2001. Given the rates of NPAs and chronic over dues, credit risk management assumes greater significance in Co-operative Banks. The inherent risk in agricultural lending makes credit risk management all the more important and burning requirement in Agricultural Credit Co-operatives. Needless to say, credit discipline should form the centre piece of the strategies for the survival and growth of PACBs.

Adinew Abate et al, (2002) examined in their research study the magnitude and growth of institutional credit flow to agricultural sector in Karnataka. They observed that recovery performance of agricultural advances especially in the post-reform period had significantly improved in commercial banks, RRBs and DCCBs lending. Only the recovery performance of PCARDBs continued to decline. They suggested that the government and lending institutions should take stringent measures on willful and deliberate defaulters and then only the problem could be solved.

Singh and Singh (2006) studied the funds management in the District Central Cooperative Banks (DCCBs) of Punjab with special reference to the analysis of financial margin. The study noted that a higher proportion of own funds and

the recovery concerns have resulted in the increased margin of the Central Co-operative Banks and thus had a larger provision for non-performing assets (NPAs).

Bhagavati Prasad (2006) has clearly pointed in his article "Co-operative banking in competitive business environment" has examined the performance of co-operative credit and banking structure. The researcher has analyzed the critical problems faced by PACBs such as lack of diversification in business portfolio, low volume of business, declining percentage of borrowing membership, high cost of management, imbalances in loan outstanding, unskilled staff, lack of professionalism, weak MIS, involvement in less profitable PDS business and low interest margin.

Agricultural Finance Sub-Committee (1945) The committee clearly observed that, "the spread of co-operation would provide the best and the more lasting solution for problems of rural economy in general and that of agricultural credit in particular." However, it was considered that it might not be possible for the cooperative movement to supply the entire credit needs of agriculturists. Therefore, it was recommended that state aid should be given in much larger measure that was provided in the past so that the co-operatives might be enabled to supply better credit facilities.

Co-operative Planning Committee (1945) - Under the Chairmanship of R.G. Saraiya in 1945, the committee recommended that primary societies be converted into multipurpose societies and that efforts should be made to bring 30 per cent of the rural population and 50 per cent of villages within the ambit of the reorganized societies within a period of 10 years, 25 per cent of the total marketable surplus or agricultural produce should come under co-operatives. Committee also recommended that Reserve Bank of India should provide greater assistance to co-operatives.

All India Rural Credit Survey or Gorwala Committee (1954) - The Committee was appointed by the Reserve Bank of India in 1951,

to supervise a survey regarding facilities available in rural areas for providing agricultural loans to the agriculturists and to make necessary recommendations. The Committee submitted its report in 1954. After analyzing the various causes for unsatisfactory working of the movement, the committee concluded that "Co-operation has failed but it must succeed". The committee recommended- A) an "Integrated Scheme of Rural Credit? involving three fundamental principles, namely- i) State participation at different levels, ii) Co-ordination of credit with other economic activities especially processing and marketing in the co-operative sector, and iii) Administration through trained and efficient personnel responsible to the needs of the rural population. B) Suitable amendments were suggested in RBI Act and the establishment of a National Co-operative Development and Ware Housing Board at all India level. C) The establishment of three special funds under the RBI was suggested. ie. i) The National Agricultural Credit (long-term operations) Fund, ii) The National Agricultural (stabilization) Fund, iii) National Agricultural Credit (Relief and Guarantee) Fund. D) A crop loan system was to be evolved. E) The economic viability of the cooperatives at the village level was very much essential. Each village society should be revitalized and reorganized for the purpose of efficient and effective administration and be made really effective. These recommendations were generally approved and were made the basis for the future plans for development.

Law Committee (1956)- Law Committee was set up by Government of India, under the Chairmanship of S.T.Raja. The committee submitted its report in 1957 and prepared a draft bill, which was forwarded to all State Governments for simplifying and liberalizing the provisions of co-operative laws and procedures, with suitable modifications and amendments to their local conditions. The law related to co-operatives, their responsibility of enactment and administration rested in the State Governments. After the committee report, many State Governments passed their new Acts.

Objectives of the Study

Based on the Literature reviewed the **primary objective** of the study is to make "**Credit Management in Cooperative Banks**". However to structure the study in a lucid logical order the following Secondary Objectives are formulated.

1. To elucidate the Credit Management system in DCC Banks
2. To evaluate the Effectiveness of Credit management by DCCBs from Employers perspective as well as customers perspective
3. To explore and compare growth in credit portfolio of DCCBs.

Hypothesis

In line with the objectives framed for the study, the researcher has set the following hypotheses in order to analyze the data statistically.

- H01: Chances of layoff of Interest or loan itself is not a significant factor influencing for preferring cooperative banks over other peer group banks.
- H02: The Overall Credit Evaluation Effectiveness of the DCCBs is not significant from the perspective of respondents with different income pattern.
- H03: The DCCBs Credit Management issues in Purpose based loans offered are not significant.

Sources of data

The present study is based on both primary and secondary data. Primary data has been collected from the sample respondents by adopting convenience random sampling method through pre-tested questionnaire. The secondary data has been collected through sources like, Published articles, reports, papers, books etc.

Table 1: Gender Wise Respondents

Gender	Frequency	Percentage (%)
Male	128	59.8
Female	86	40.2
Total	214	100.0

Source: Primary Data

Table 1 show the gender wise classification of respondents participated in the study. The percentage of male is more than female respondents who have rendered their opinion on credit management of cooperative banks. 59.8 percent of the respondents are male and 40.2 percent of the respondents are female. It is to be noted that, Male respondents were more open and had been more responsive in responding to the scheduled questions. However the researcher made sincere attempt in majority of the instances to obtain equal responses from both gender with the help of bank employees.

Table 2: Age Wise Distribution of Respondents

Age	Frequency	Percentage
20 Years to 30 Years	22	10.3
30 Years to 40 Years	101	47.2
40 Years to 50 Years	59	27.6
50 Years and above	32	15.0
Total	214	100

Source: Primary Data

Table 2 shows the age wise classification of the respondents participated in the study. 10.3 percent of the respondents are of the age group between 20 years and 30 years, 47.2 percent of the respondents are of the age group between 30 years and 40 years, 27.6 percent of the respondents are of the age group between 40 years and 50 years and 15 percent of the respondents are above 50 years. It is to be noted that, most of the respondents above 40 years with more number of years of association with the bank had favorable and positive opinion in most of the cases but the same was not true with that of age group 20 to 30 years. It is observed that, the respondents of age group had more of comparative and competition based opinion on credit management of DCCBs and more to say on Ease of operation and use of Technology.

Table 3 Numbers of Years of Association with the Bank

Number of Years	Frequency	Percentage
Less than 1 Year	11	5.1
1 to 5 Years	168	78.5
More than 5 Years	35	16.4
Total	214	100.0

Source: Primary Data

Table 3 shows the number of years of association of the respondents with the bank involved in the study. 5.1 percent of the respondents are associated with the bank for less than one year. 78.5 of the respondents are associated with the bank between 1 and 5 years. 16.4 percent of the respondents are associated with the bank more than 5 years. The data clearly signifies that majority of customers are being associated with the bank for considerable number of years. However it is also important to note that actively involved number of young customers is very low compared other groups.

Factors supporting opinion of the respondents on attributes of the bank they are associated with The Karl Pearson's Co-efficient of Correlation measures how variables or rank orders are related. This is useful in a linear relationship among variables. It also develops the linear parametric relationship among any of the factors. When two variables are continuous in nature and exploring relationship between or among variables correlation is apt statistical tool to find Numerical estimates of the correlation coefficient and test for the statistics significance of the correlation coefficient. Pearson correlation coefficient is denoted by "r" which always by definition lies between -1 and +1. Interpretation for r-value should normally be as follows.

- 0.0 - 0.2 poor correlation
- 0.2 - 0.4 fair correlation
- 0.4 - 0.6 Moderate correlation**
- 0.6 - 0.8 good correlation
- 0.8 - 1.0 strong correlation

Table 4: Correlation coefficient for the opinion of the respondents on attributes of the bank they are associated with

Attributes	Factor supporting		
	Pearson Correlation	Sig. (1-tailed)	N
Subsidized Interest Loans	0.708	0.001	214
Attractive Interest Rates	0.635	0.000	214
Competitive Loan amounts on Purpose based Loans	0.889	0.000	214
Permissible Amounts on Available security (Margin on security)	0.805	0.000	214
Subsidies	0.577**	0.000	214
Chances of layoff of Interest or loan itself (more significant)	0.901***	0.000	214
Security deposit Free loan	0.842	0.000	214
Government promotional schemes	0.621	0.000	214
Easy of getting loan	0.655	0.000	214

Source: Primary Data [*** highly significant (Strong Correlation) ** Least Significant

Table 4 depicts the Karl Pearson's coefficient of correlation of the opinion of the respondents on attributes of the bank they are associated with. Out of nine attributes included for the study four attributes are more significant, out of which the chances of layoff of interest or loan itself plays more significant with a correlation value of 0.901. the other important attributes with high significant values are competitive loan amounts on purpose based loans, security deposit free

loan, permissible amounts on available security deposit with the correlation value of 0.889, 0.842 and 0.805 respectively. Subsidies provide by the bank has a least correlation value and it is inferred from the table that is least significant.

Based on the above table and the correlation it is proved that the first hypothesis, that too alternative hypothesis is proved. So it can be reasonably stated that Chances of layoff of Interest or loan itself is a significant factor influencing for preferring cooperative banks over other peer group banks.

Table 5: Descriptive Statistics

Factors	Mean	Std. Deviation	N
Subsidized Interest Loans	4.62	.714	214
Interest Rates	2.70	1.445	214
Competitive Loan amounts on Purpose based Loans	2.76	.897	214
Permissible Amounts on Available security deposit (deviation is high)	3.30	1.389	214
Subsidies	4.52	.948	214
Chances of layoff of Interest or loan itself	4.32	.946	214
Clean Loan: Security Free loan (deviation is high)	3.29	1.387	214
Government promotional schemes	4.72	.578	214
Easy of getting loan (deviation is high)	3.27	1.367	214

Source: Primary Data

Table 5 indicates mean and standard deviation values performed using the descriptive statistics. A set of nine factors were considered for the study, out of which four factors have high degree of deviation compared to other factors namely, interest rates, permissible amounts on available security deposit, security deposit free loan and easiness in getting loans with a standard deviation score of 1.445, 1.389, 1.387 and 1.367 respectively. Government promotional scheme has a low degree of standard deviation with a score of 0.578.

One way ANOVAS between nature of association with agriculture and loan sanctioning effectiveness

The analysis of variance technique helps to draw inferences whether the samples have been drawn from population having the same mean, In general the ANOVA techniques investigate any number of factors which are supposed to influence the dependent variable of interest. It is also possible to investigate the differences in various categories within each of these factors.

Table 6: Nature of Association with Agriculture and Loan Sanctioning Effectives

Dependent Variable	Level	ANOVA				
	Nature of Association with Agriculture	N	Mean	SD	F	Sig.
Credit Evaluation Committee	Agriculturist (with no Income alternative)	78	3.30	0.71	4.53	0.00
	Agriculturist(with Income alternative)	136	3.10	0.68		
	Total	214	3.20	1.39		
Collateral Evaluation Powers with Branch Employees	Agriculturist (with no Income alternative)	78	3.10	0.76	5.78	0.03
	Agriculturist(with Income alternative)	136	2.90	0.89		
	Total	214	3.00	1.65		
Clarity in Standard Procedure for Credit Evaluation	Agriculturist (with no Income alternative)	78	3.30	0.711	2.26	0.00
	Agriculturist(with Income alternative)	136	3.10	0.68		
	Total	214	3.01	1.39		
Overall effectiveness of Credit Evaluation	Agriculturist (with no Income alternative)	78	2.20	0.70	4.69	0.01
	Agriculturist(with Income alternative)	136	2.80	0.64		
	Total	214	2.50	1.34		
Loan Sanctioning Committee	Agriculturist (with no Income alternative)	78	3.20	0.70	4.90	0.09**
	Agriculturist(with Income alternative)	136	3.10	0.62		
	Total	214	3.15	1.32		
Sanctioning Procedure	Agriculturist (with no Income alternative)	78	2.90	0.69	4.27	0.08**
	Agriculturist(with Income alternative)	136	3.12	0.67		
	Total	214	3.01	1.36		
Consumer Awareness On Sanctioning Procedure	Agriculturist (with no Income alternative)	78	2.23	0.56	5.27	0.00
	Agriculturist(with Income alternative)	136	3.14	0.68		
	Total	214	2.68	1.24		

Renewal Procedure	Agriculturist (with no Income alternative)	78	2.43	0.69	4.32	0.00
	Agriculturist(with Income alternative)	136	2.98	0.68		
	Total	214	2.70	1.37		
Political Interference	Agriculturist (with no Income alternative)	78	2.48	0.67	5.01	0.00
	Agriculturist(with Income alternative)	136	2.10	0.68		
	Total	214	2.29	1.35		
Corruption	Agriculturist (with no Income alternative)	78	2.76	0.75	4.11	0.09**
	Agriculturist(with Income alternative)	136	2.98	0.72		
	Total	214	2.87	1.47		
Favoritism	Agriculturist (with no Income alternative)	78	2.97	0.67	4.21	0.00
	Agriculturist(with Income alternative)	136	2.11	0.62		
	Total	214	2.54	1.29		

Source: Primary Data

Table 6 indicates the nature of association with agriculture and loan sanctioning effectiveness using one way analysis of variance. Totally eleven factors were considered and included for the study and the results indicate that loan sanctioning committee, sanctioning procedure and corruption were not significant when compared to other factors. Other factors like credit evaluation committee, collateral evaluation powers with branch employees, clarity in standard procedure for credit evaluation, overall effectiveness of credit evaluation, consumer awareness on sanctioning procedure, renewal procedure, political Interference and favoritism were significant.

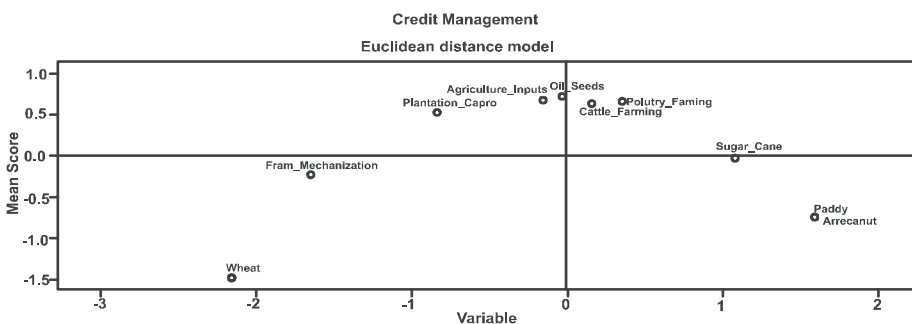
From the above table and interpretation it can be reasonably justified that, The Overall Credit

Evaluation Effectiveness of the DCCBs is significant from the perspective of respondents with different income pattern. Hence the alternative hypothesis HA2 of Overall Credit Evaluation Effectiveness of the DCCBs being significant from the perspective of respondents is proved.

Presence of Credit Management Issue by Type of Loans in the Branch

Mapping Tools was applied. "Multidimensional scaling usually plots the perceptions and preferences of individuals singly and as a group even when the information about the dimensions or bases of evaluations is minimal. Perceptual Mapping Analysis of Credit Management issue by type of loans in the branch has been shown below.

Figure 1: Perceptual Mapping Analysis of Credit Management issues in Purpose based loans offered



The above diagram depicts the perceptual mapping of the various types of loans facility offered by the bank to the customers. The perceptual map has four quadrants namely Low-low, low high, high-low and high-high. The type of loan facilities fall under the high-high category which was most preferred by the customers are poultry farming, cattle farming and sugar cane. The bank can continue with the efforts they are offering to their customers for these types of loans. For the loans provided for farm-mechanization and ware house loans has to take necessary action to improve on it because it was not preferred by the customers as they fall under the low-low quadrant.

From the above perceptual mapping, it can be reasonably stated that there are issues in Credit Management in Purpose based loans offered and the significance is proved. Hence the third alternative hypothesis is proved that is The DCCBs Credit Management issues in Purpose based loans offered are not significant.

Conclusion

On the basis of qualitative and quantitative analysis, and keeping in mind the aim and objectives of the Study, this research paper summarizes, broad Findings of the Study and the related Conclusions. The Conclusions of the Study pointed out a variety of issues and concerns, which need to be addressed for the evolution and effective implementation of proper credit management practices in the District Central Cooperative Banks in Shivmogga district. The credit management in banks has been the interest of the academicians, researcher and the policy maker for a longer period of time. In addition to that the theme of credit management in DCCBs is socially highly relevant in today's business and economy. In this connection the present study captioned "Credit Management in co-operative Bank - an exploratory study of DCC Bank of Shivamogga District.

This study basically analyses the credit management policy and practices of DCCBs in Shivamogga District from both the perspectives

of employees and the perspectives of the customers of the banks by conducting a survey. Finally for building co-operative institutions it need leadership with dedication and determination wedded to the ideology of co-operative. Unfortunately as the saying goes, "co-operation has failed for want of co-operative" naturally. Therefore co-operative can succeed with co-operation. If the mentioned suggestions are implemented in latter then spirit of co-operative credit system can serve as an effective instrument for the catalytic of agricultural and rural development.

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Cost Analysis, Cost Controlling and It's Effectiveness - Selected Hospitals

7

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Abstract

Cost-Effectiveness is a method for identifying interventions that achieve the greatest level of health impact per unit of expenditure. Effectiveness is typically measured in terms, improvements in health status. An important aspect of cost-effectiveness analysis is that it can be used to assess technical and allocative efficiency. Cost-benefit analysis is very widely used and it is therefore important that its methods be properly understood. In this article to contribute to the understanding by giving a formal description of the subject and examining the theoretical basis for some of the techniques which have become accepted tools of decision-making around the world. The data from the Supraja Hospital in Hyderabad can be used to identify areas of inefficiencies by comparing the costs and outputs. By comparing results of the various facilities, the range of costs for outpatient and inpatient services becomes evident and reasons for the differences can be better analyzed: low utilization, high administrative costs, personnel staffing, equipment and maintenance budgets, etc. Strategies can then be developed to address the problems, which may include increasing utilization of under-utilized facilities, changing staffing patterns, closing under-utilized facilities, etc. This study highlights the Cost analysis of various departments and the cost cutting recommendations to the Supraja Hospitals for the period of two years (2014-16).

Key Words: Cost-Benefit Analysis, Capital Costs, Personnel Staffing, Cost by Budget Category, Cost Analysis, Efficiency Indicators.

Introduction

A cost analysis is described by the American Accounting Association as "The foregoing in the monetary terms, incurred or potentially to be incurred in realization of objective of management which may be manufacturing a product or rendering of service." This particular study has been undertaken in order to ascertain various costs under different departments that are incurred in the health care industry named Supraja Hospitals and also to identify those departments where more costs are incurred. This article also focuses on cost benefit analyses where the benefits earned by investing in certain areas various areas where cost can be reduced are identified and also few suggestions are given to the industry for better cost control. The objective of cost control is to achieve the cost target and it aims at maintaining the cost in accordance with established standards. It aims at lowest possible cost under existing conditions. The article uses the step-down technique for allocating overhead and intermediate service departments costs to final service departments. The step-down technique was also used to allocate overhead and intermediate service department staff to final service department, and to estimate the full-time equivalents for each department and clinic.

Two major avenues for increasing health benefits from scarce resources are 1) increasing the efficiency and improving the management of existing health facilities and health programs and 2) increasing the allocation of resources to those programs that are most cost-effective. In order to increase the use of scarce resources for more cost-effective and efficient services, the Ministry of Health and Population undertook a cost-effectiveness exercise. Cost-Effectiveness is a method for identifying interventions that achieve the greatest level of health impact per unit of expenditure. Effectiveness is typically measured in terms of improvements in health status. An important aspect of cost-effectiveness analysis is that it can be used to assess technical and allocative efficiency.

Cost Allocation among Departments

Total costs consist of recurrent costs and the discounted present value of capital costs. These are allocated to the overhead, intermediate service, and final service departments according to the proportion of support required by each department. Data collected for cost estimation were grouped under five broad categories: major and minor equipment, building and permanent structures, labor (personnel costs), utilities, drugs and medical supplies.

1. Capital Costs are the annual costs of resources that have a life expectancy of more than one year. They include depreciated annual costs for buildings, equipment and furniture. The study uses replacement costs for capital items.
2. Recurrent Costs are costs associated with inputs that will be consumed or replaced in one year or less, such as salaries, training (refresher courses), drugs, food and utilities.

Purpose of the study

The Purpose of the study is to know the cost incurred in the various departments of Supraja Hospital. To know the cost of a departments in the particular financial years. To analyze the profit and loss account of the Supraja Hospitals and how much expenses they are bearing in the financial years.

Scope of the study

The study is confined to the period of 2014-16. In this study attempts are made to discover the general rates and prices of the equipment's and pharmacy (Medicines) used in the Hospital. This study is useful for the Supraja Hospitals to know how much they are expending in different departments and how to control the costs in next financial year. The study will also be useful in deciding the purchase of equipment's from various suppliers

Objectives of the study

The study is an attempt to seek an insight into aspects that are involved in Cost Analysis to achieve the following objectives: To find the Cost Analyzing & its effectiveness on the firm from 2014-16.

The main objectives of the cost and allocative efficiency article of the Supraja Hospitals are the following: (a). Develop a clear and appropriate methodology for calculating the service cost. (b). Estimate the actual economic costs of services delivered by each medical department of the hospital. (c). To give cost cutting recommendations to the hospital after analyzing the cost analysis of the Hospitals.

Review of Literature

Review: 1

Authors: Sheetal Vyas, Gneyaa S Bhatt, Kinnari I Gupta, Hemant Tiwari

Title: A cost analysis of deliveries conducted in various health care settings in a city of India

Description

In the present study, the differences in average total expenditure in case of ND as well as CS in Government, Corporation and Private Hospitals and in Home (for ND only) were found significant. This difference is mainly because of difference in the direct medical cost in these settings. In civil hospital, it is only that of medicines and consumables and no cost of hospital bill to the patients. Even the charges taken by personal in home delivery either in cash or in most cases in

kind were higher than the cost in government hospital. In case of CS delivery direct non-medical and indirect cost were higher in government hospital that may be because duration of stay was more in these cases. It was seen that quite a big share of monthly income was spent for child birth especially in corporation and private institutions. In case of CS delivery, it even exceeded 100%. One fifth of the family were compelled to take debt to overcome the expenditure

Review: 2

Author: Jane Doherty

Title: Cost-effectiveness analysis for priority-setting in South Africa - what are the possibilities?

Description:

Some capacity to undertake costing and CEA in South Africa already exists. CEA information has already influenced clinical decision-making and policy. The following are possibilities offered by CEA and burden of disease estimates to contribute further to decision-making in South Africa:

1. Promotion of dialogue on health and health care priorities as well as affordability.
2. Advocacy against interventions that are clearly cost-ineffective and unaffordable (especially at central hospital level).
3. Advocacy for interventions that strengthen the district health system (because of the highly cost-effective nature of primary and district hospital care), including motivation for increased funding from Treasury.
4. Advocacy for acceptable pricing of drugs and vaccines.
5. Assessment of innovative new interventions, including those for emerging conditions.
6. Identifying clusters of interventions that can enhance the shared use of inputs, reduce costs to patients, achieve synergy between interventions, reach related individuals, and screen patients at the primary level to increase efficiency of referral.

Review: 3

Title: Health Cost Containment and Efficiencies

Source: National Conference of State legislatures (NCSL Briefs for State Legislators)

Description:

NCSL's Health Cost Containment and Efficiency Series describes multiple alternative state policy approaches, with an emphasis on documented and fiscally calculated results. An article is housed at the NCSL Health Program in Denver, Colorado. It is led by Richard Cauchy, program director, and Martha King, group director, with Barbara Yonder as lead researcher and author of most of the briefs.

NCSL gratefully acknowledges the financial support for this publication series from The Colorado Health Foundation and Rose Community Foundation of Denver, Colorado.

1. This brief focuses on reforms designed to reduce medical malpractice litigation costs. Other types of reforms are primarily intended to reduce the incidence of medical negligence (e.g., by improving hospital patient safety or giving patients access to reports of hospitals' and doctors' adverse incidents).
2. A "tort" is defined as a wrongful act other than a breach of contract that injures another and for which the law imposes civil liability.

Complementary Strategies the cost savings potential of medical malpractice liability reforms may be enhanced when offered with complementary cost containment strategies. Examples include patient safety initiatives and global payments to providers, which are the subject of other briefs in this series. Other complementary strategies include providing adequate or enhanced funding for state medical boards to expeditiously investigate complaints about and discipline doctors; developing robust data-collection efforts to track and analyze medical errors and instances of malpractice; and supporting efforts to make clinical best practice guidelines widely available to, and a safe harbor in malpractice cases for, clinicians.

Review:4

Title: Cost-effectiveness Analysis of Health Care Interventions in Meskanena Mareko Wereda, Ethiopia

Authors: Ababi Zergaw, Damen Haile Mariam, Ahmed Ali

Description:

Implementing 22 health care interventions with cost of less than 100 Birr per DALY gained at the health stations level will avert 52% of the BOD in the area. On the other hand implementing 17 interventions at the hospital and 18 interventions at the health center level will avert only about 22 to 34% of the BOD.

Objectives: To analyze and evaluate the cost-effectiveness of health care interventions in terms of lessening disease burden and improving health status in a rural community.

Methods: The evaluation was conducted in health institutions in Meskana Mareko Wereda and in Shashemene Hospital that were purposively selected. Article subjects were people utilizing these facilities. Data on inputs of interventions were analyzed using the Disease Burden Modeling System and Disability Adjusted Life Years (DALYs) gained was used as a measure of effectiveness of interventions.

Results: Interventions at health stations level were most cost-effective compared to those at health center and the hospital. Generally, community and preventive interventions were found to be more cost-effective in lessening existing burden of disease (BOD) in the local community and in improving the general health status of the populations with cost of less than 5 Birr per DALY gained.

Review:5

Title: Evaluating Costs and its Benefits in Health Care

Description:

Most of the specific findings of this report relate to two major general findings of the OTA

assessment. The first of the general findings is that performing an analysis of costs and benefits has the potential to be very helpful to decision makers, because the process of analysis structures the problem, allows an open consideration of all relevant effects of a decision, and forces the explicit treatment of key assumptions. The second general finding is that CEA/CBA exhibits too many methodological and other limitations to justify relying solely or too heavily on the results of formal CEA/CBA studies in making a decision. Thus, CEA/CBA could be useful for assisting in many decisions, but is probably not appropriate as the sole or prime determinant of a decision.

About the Company

- **Inspired to Be the Best:** Supraja Hospitals was founded by a group of doctors who are committed to provide world-class tertiary care at affordable prices coupled with a patient friendly environment and empathy. As they believe empathy is the most soothing human gesture that is as important as treatment! Supraja Hospitals strive to be a people's hospital offering exceptional value and unconditional transparency.
- **Inspired to Set Standards:** At Supraja Hospitals they believe 'Healthy Living' is every individuals birth right, this motto ever inspires us to serve better...and forms the philosophy behind our vision, mission and core values.

Supraja Hospitals are distinguished from the rest by:

- Health care services catering to the growing middle-income Groups
- World class standards of hygiene and infection Control
- High level of expertise available through highly trained professionals
- Continuous medical and professional education programs for all Staff
- Personalized patient care with professionally trained Staff

- Patient friendly design, that allows easy access to all departments
- Internationally benchmarked standard protocols and 'evidence-based' medical practice
- Cashless In-patient services for patients with insurance and employees of corporate companies

Hospitals

Despite the increased outsourcing (not uncommon in any industry today) of medical records, housekeeping, lab testing, and clinical services (e.g., orthopedics and radiology), hospitals remain the biggest employers in the health-care industry. The huge networks such as HCA and Tenet demand a steady supply of doctors, nurses, administrators, medical technicians, therapists, and other support staff. In areas where competition from HMOs is mounting and cost-cutting is a priority, former staff may move outside the immediate confines of a hospital. However, close and important links remain-particularly for any type of surgery or specialized treatment such as chemotherapy.

Home care

Advances in technology have done much to improve efficiency and reduce costs for both patients and home care staff. Today, home care nurses and aides can administer complex treatments previously available only in hospitals and clinics to the elderly and severely disabled in their own homes. And because almost all hospitals and HMOs now release patients before they are self-sufficient, home care is often the most cost-effective choice. Most jobs in this sector don't require much training (they are closely supervised by RNs, NPs, or physicians)-just deep reserves of patience and kindness.

Care for profit

Most people pursue a career in health care because they want to help people in need. Increasingly, however, the business side of health care has come between patients and providers.

"At my hospital, we're supposed to call the patients 'customers,'" says one insider. "I keep telling my boss this is not Lord Taylor!" or "All I can say is it stinks, and corporate America has no business in the system," says another. Lots of strong emotions emerge in this discussion, and these days are certainly not easy or happy ones in this industry. The higher up the ladder you go, the more bruising and harsh the politics and economics tend to become.

Methodology

Methodology is a way to solve the research problem systematically. It includes the methods required for systematic analysis and logical interpretation of empirical evidence. So, it covers the source of data collection, tools and techniques used for the analysis, interpretation and presentation of data and limitations of the study.

Research Tools

The detailed procedure of calculation adopted by the researcher: Annual Costs of Supraja Hospitals for the financial years 2014-16

Diagrammatic and graphical representation of data:

A picture is a worth of thousand words. Thus created by a picture has much greater impact than any amount of detailed explanation. Statically data can be effectively presented in the form of Graphs and Diagrams. Graphs and Diagrams make complex data simple and easily understandable. They help to compare related and bring out subtle data with amazingly clarity.

Data Collection

There are two types of data collection one is primary data collection and other one is secondary data collection. Here in this study secondary data collection used.

Secondary data

The article collects most of the information from different secondary resources official websites, financial statements, newspapers and by using the statistical tools and different methods also.

- Annual reports of various departments
- Internet
- Magazines and journals

Period of the study

The period of the study is confined to financial years 2014 - 2016

Tools and Techniques used

- **Average cost (unit cost):** Defined as the total cost divided by number of units of output, e.g., cost per admission, cost per patient-day and cost per outpatient visit. Similarly, marginal cost is the additional cost required to produce one more unit of output.
- **Annual cost of department:** The total annual cost of the department after allocation of overhead and intermediate departments using the step-down allocation method.
- **Annual hospital expenditures:** Includes the annual cost of personnel, medications, depreciation of buildings and equipment, and food and utilities.
- **Average length of stay (ALOS):** The mean number of days from admission to discharge for diagnosis and inpatient department.

$$\text{ALOS} = \frac{\text{Annual number of inpatient days}}{\text{Annual number of admissions}}$$
- **Bed turnover rate (T):** The average number of patient admissions per bed during one year.

$$T = \frac{\text{Annual number of admissions}}{\text{Average number of available hospital beds during a year}}$$
- **Capital cost:** The annual cost of resources that have a life expectancy of more than one year, e.g., buildings, equipment and vehicles. Staff training also can be classified as capital cost if the new skills are expected to last for one year or more. The costs of refresher training courses that occur throughout the

year should be classified as recurrent.

- **Cost-effectiveness analysis:** The technique used for identifying which health interventions achieve the greatest level of health impact per unit of investment.
- **Cost per admission = Total annual cost of inpatient department/total annual number of admissions for the department. Direct costs of department:** The costs attributed to each cost center prior to the allocation of the cost centers associated with hospital outputs.
- **Financial cost:** The actual expenditures or outlays made for a specific intervention.

Limitations of the study

- The study is confined to a period of 2014-2015 and 2015-2016 only.
- Being the Hospital was recently established so we can't get the exact capital costs of the hospital.
- Need to improve in the efficiency indicators of the Hospital.
- Another important limitation of the study is the adjustments made for the unit prices for the purpose of rounding off. As a result, a few of the places in the study variations are occurring.

Data Analysis and Interpretation

Capital Costs

Annual Cost for Fixed Assets

The study used the replacement cost of fixed assets during the period of reference time, the period of data collection from 01-04-2014 to 31-03-2015. This categorizing system was designed with the assistance of experts in the field of medical supplies who are familiar with the actual productive lifetime for equipment and furniture in India according to the level of maintenance and used frequency of the fixed assets. The costs of the total fixed assets are shown below:

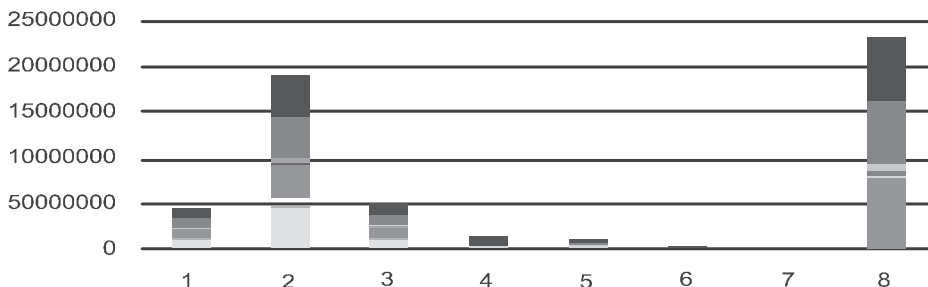
2014-2015

Particulars	Additions during the year	Depreciation	Net Block
lease hold	11080233	56904	11023329
hospital equip	46063025	689368	45373657
electrical equip	11866388	264328	11602060
Computer	1139765	49951	1089814
furniture	2392557	47717	2344840
office equip	797076	15897	781179
Vehicles	413000	12362	400638
Total	73752044	1136527	72615517

2014-2016

1/4/2015	Additions	Gross as at 31-3-2016	Deprecia TION as at 1-4-2015	From the year	Total Deprecia tion as at 31-3-2016	Net Block 31-03-2016	31-03-2015
11080233	397054	11477287	56904	364679	421583	11055704	11023329
46063025	1035000	47098025	689368	3419565	4108933	42989092	45373657
11866388	532020	12398408	264328	1174855	1439183	10959225	11602060
1139765	97250	1237015	49951	398015	447966	789049	1089814
2392557	63440	2455997	47717	235323	283040	2172957	2344840
797076	0	797076	15897	158329	174226	622850	781179
413000	0	413000	12362	49464	61826	351174	400638
Total	2124764	75876808	1136527	5800230	6936757	68940051	72615517

Cost of fixed Assets



Interpretation: Hospital was established in ending of financial year 2012-13, so no fixed are purchased. Fixed assets are purchased in the F.Y.2014-2015 so it comes under additions, the net block of fixed assets in F.Y 2014-15 is 72615517. In 2015 again additions value of 2124764 added. Here they followed **straight line depreciation method** so in the F.Y. 2015-2016 the same depreciation value has carried down. Comparing to the F.Y. 2014-2015 and 2015-2016 the net block value of asset is higher in F.Y.2014-2015 only because of heavy depreciation charged.

Annual Cost of Drugs and Medical Supplies

This category includes drugs and medical supplies provided by the hospital. It does not include prescribed drugs that patients purchase outside of the hospital. Data related to drugs and medical supplies used by the final service departments were collected from the Pharmacy and Store Departments. Cost analysis shows that 16% of annual hospital expenditures were spent on drugs and medical supplies.

Results of the study

This section presents the main findings from the study. To recapitulate, the total annual cost is the sum of the annualized capital costs and recurrent costs. In turn, capital costs and recurrent costs are subdivided into five subcategories. The total annual cost for Supraja Hospital in 2014-2015 and 2015-2016 was 24642881 and 93060753.

Cost by Budget Category

Breakdown of total costs by capital and recurrent costs:

- ♦ Annualized capital costs represented 33.93% percent of total costs. Of these building costs accounted for 6% and equipment and furniture 14%. For the analysis, the cost of land is not taken into consideration.

- ♦ Recurrent costs represent 80 percent of the total cost. Personnel accounted for 51 percent of total cost, followed by drugs and medical supplies at 16 percent and utilities at 13 percent.
- ♦ Physicians account for 45 percent of personnel costs, followed by nurses at 20 percent, and other personnel making up the remaining 35 percent.
- ♦ A large portion of the cost of drugs and medical supplies - 30 percent - is attributable to the renal dialysis department.
- ♦ Only 0.28 percent of the total annual recurrent costs are spent on maintenance.

Department Specific Results

Ear, Nose and Throat Department

Cost Analysis

- ♦ Annual cost of the department; 483485 (5% of total annual expenditures of inpatient departments). Cost per inpatient admission: 1328
- ♦ (Annual cost of the department/ No.of inpatients = 483485/364)
- ♦ Average Cost per month 40,290 (483485/ 12)
- ♦ Average length of stay: 2.85
- ♦ Annual cost per bed: 3233
- ♦ (Annual cost of the department/ No.of beds in hospital)

Efficiency Indicators

- ♦ Annual admissions: 364 (4.37 percent of total annual admissions)
- ♦ Occupancy rate: 29.37
- ♦ Bed Turnover Rate: 3
(Annual number of admissions/Average number of available hospital beds during a year: 364/150)

General Medicine Department

Cost Analysis

- Annual cost of the department; 28711916 (20% of total annual expenditures of inpatient departments)
- Cost per inpatient admission: 7667
- (Annual cost of the department/ No. of in patients = 28711916/3745)
- Average Cost per month 2392660 (28711916/12)
- Annual cost per bed: 191412
(Annual cost of the department/ No.of beds in hospital)

- Average length of stay: 11.06

Efficiency Indicators

- Annual admissions: 3745(21.27 %of total annual admissions)
- Occupancy rate: 40%
- Bed Turnover Rate: 25
(Annual number of admissions/Average number of available hospital beds during a year: 3745/150)

Cardiology:

Cost Analysis

- Annual cost of the department; 113586 (0.12%% of total annual expenditures of inpatient departments)
- Cost per inpatient admission: 1321
- (Annual cost of the department/ No.of in patients =113586/86)
- Average Cost per month 9466 (113586/12)
- Annual cost per bed: 757.24
(Annual cost of the department/ No.of beds in hospital)
- Average length of stay: 2.28

Efficiency Indicators

- Annual admissions: 86 (0.5%of total annual admissions)
- Occupancy rate: 10%
- Bed Turnover Rate: 1
(Annual number of admissions/Average number of available hospital beds during a year: 86/150)

Radiology:

Cost Analysis

- Annual cost of the department; 986697 (1.09% total annual expenditures of inpatient departments)
- Cost per inpatient admission: 1019
- (Annual cost of the department/ No. of in patients =986697/968)
- Average Cost per month 82224.75 (986697/12)
- Annual cost per bed: 6577.98
(Annual cost of the department/ No.of beds in hospital)
- Average length of stay: 5.25

Efficiency Indicators

- Annual admissions: 968 (5.5%of total annual admissions)
- Occupancy rate: 15%
- Bed Turnover Rate: 7
(Annual number of admissions/Average number of available hospital beds during a year: 968/150)

Neurology Surgery:

Cost Analysis

- Annual cost of the department; 1970209 (2.19% total annual expenditures of inpatient departments)

- Cost per inpatient admission: 30310
(Annual cost of the department/ No. of in patients = 1970209/65)
- Average Cost per month: 164184 (1970209/12)
- Annual cost per bed: 13135
(Annual cost of the department/ No. of beds in hospital)
- Average length of stay: 5.70

Efficiency Indicators

- Annual admissions: 65 (0.5% of total annual admissions)
- Occupancy rate: 5%
- Bed Turnover Rate: 0.43
(Annual number of admissions/Average number of available hospital beds during a year: 65/150)

Orthopedics:

Cost Analysis

- Annual cost of the department; 11945097 (13.28% total annual expenditures of inpatient departments)
- Cost per inpatient admission: 6192.37
(Annual cost of the department/ No. of in patients = 11945097/1929)
- Average Cost per month: 995424.75 (11945097/12)
- Annual cost per bed: 79633.98
(Annual cost of the department/ No. of beds in hospital)
- Average length of stay: 12.33

Efficiency Indicators

- Annual admissions: 1929 (11% of total annual admissions)
- Occupancy rate: 35%
- Bed Turnover Rate: 13
(Annual number of admissions/Average number of available hospital beds during a year: 1929/150)

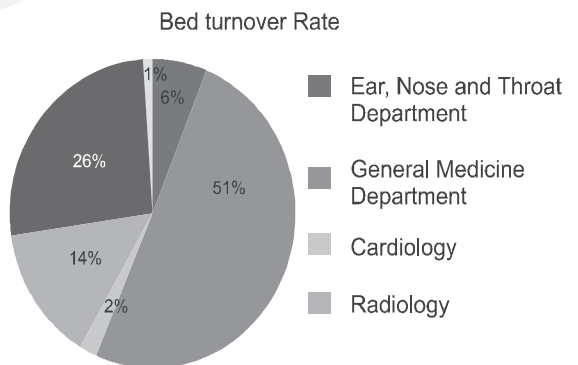
Interpretation:

Comparing to 6 departments in Hospitals out of all these departments the no. of admissions are highest in the General medicines followed by orthopedics department. The hospital is a multi-specialty hospital and filled with 150 beds. So, the bed turnover rate is highest in General Medicine department with 25 and Orthopedics with 13 /the lowest was occupied by Neurology Surgery with 0.43%. The General medicine department occupied highest in all the efficiency indicators of the hospital because the major in patients and the major part of revenue are coming to the hospital from this department only.

Bed Turnover Rate: Bed turnover rate (T): The average number of patient admissions per bed during one year.

(T = Annual number of admissions/Average number of available hospital beds during a year)

Particulars	Bed turnover rate
Ear, Nose and Throat Department	3
General Medicine Department	25
Cardiology	1
Radiology	7
Neurology Surgery	13
Orthopedics	0.43

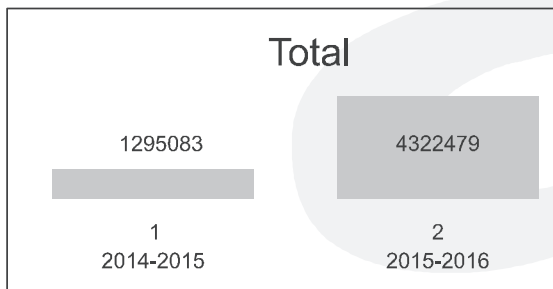


Interpretation: The highest bed turnover rate is of General medicine department with 25 followed by orthopedics with 13 because the admissions of the department are increasing more in the general medicine department.

Financial cost: The actual expenditures or outlays made for a specific intervention.

Result: The annual financial costs of the hospital for the F.Y. 2014-2015 and 2015-2016 is 1295083 and 4322479 the finance costs are again classified in to 2 categories i.e., Interest cost and bank charges and other borrowing cost. The division of finance costs has shown in the following table and graph:

Particulars	2014-2015	2015-2016
Interest cost	1206084	4029607
Bank Charges and other borrowing cost	88999	292872
Total	1295083	4322479



Interpretation: Here in 2013-2015 the finance costs are low compared to the 2015-2016 where the capital costs are higher in 2014-2015 than 2015-2016. In 2014-2015 the bank charges are less i.e., 88,999/- compared to 2015-2016 i.e., 1,206,084/-.

Average cost (unit cost): Defined as the total cost divided by number of units of output, e.g., cost per admission, cost per patient-day and cost per outpatient visit. Similarly, marginal cost is the additional cost required to produce one more unit of output.

Average cost per unit:

$$98860983/104013883 = 0.983 \text{ (2015-2016)}$$

$$25779407/17932055 = 1.4376 \text{ (2014-2015)}$$

Summary of findings

The annual expenditure of hospital is highest in 2015-2016 is of Rs. 9,88,60,983 than the 2014-2015 Rs. 2,57,79,407 because the established in the 2013 January so there is no capital costs at the end of year 2014-2015. The cost-efficiency indicators of the Supraja Hospitals are Bed turnover Rate, Annual admissions and Occupancy rate here the occupancy rate of neurology is very less i.e., 0.43% because the hospital was established recently so the major patients will come for General medicine department only. The Bed turnover rate is highest with 25 in General medicine department so 1st Length of stay of this department is 2nd highest with 11.03% and the highest with 12.33% in Orthopedics department.

The financial costs have been classified in to 2 types they are interest cost and bank charges and other borrowing costs. In 2014-2016 the financial costs of the hospital was increased due to the more financial need of the hospital as it was recently established. The capital costs of the Hospital (All Tangible Fixed assets) is higher in the 2014-2015 than compared to 2015-2016 with 72,615,518/-. Here they followed straight line depreciation /method so the first year carried depreciation was carried same to the next year with the cost of 1136526/-. The average length of stay (ALOS) is an important indicator of the efficiency of hospital resource utilization. Differences in the average length of stay among comparable types of departments imply differences in prevailing treatment practices across the hospital. The Length of stay is highest in General medicine department. To recapitulate, the total annual cost is the sum of the annualized capital costs and recurrent costs. In turn, capital costs and recurrent costs are subdivided into five subcategories. The total annual cost for Supraja Hospital in 2014-2015 and 2015-2016 was 2,46,42,881 and 9,30,60,753. Data related to

drugs and medical supplies used by the final service departments were collected from the Pharmacy and Store Departments. Cost analysis shows that 16% of annual hospital expenditures were spent on drugs and medical supplies.

Recommendations to improve the Cost-efficiency of Supraja Hospital include:

Hospitals perform a range of different functions, including provision of inpatient treatment services within various medical specialties, specialist and general outpatient care, medical and paramedical support services, and other support services such as administration. It is important to know the balance of resources absorbed by different functions. To examine the efficiency with which departments of the hospital carry out their intended functions it would be desirable to have studies which specify cost functions and estimate average costs.

The depreciation cost will be calculated under the straight-line depreciation method so the actual cost of the Fixed Asset would be not shown exactly so it is better to follow the Written Down value method. Increase hospital autonomy and decision-making by the hospital director in budget allocations, staffing, drugs purchases, etc. A performance-based incentive system is one feasible and practical method for rewarding good management practices and performance. Staffing ratios per bed or bed day are not an infallible proxy for quality of service. Training and skill level, supporting technology, team work, and organization of services are all essential complementary co-determinants of quality. In addition, differences in the case mix inside and between departments has an important role. For example, ICU patients need more staff than orthopedics patients. Increases in the budget for drugs and medical supplies. This will increase the total annual cost of the hospital; on the other hand, the availability of drugs will likely increase the quality of care and the utilization rate (number of admissions) and this, in turn, will decrease the total cost per admission.

Treatment protocols for the same cause of admission vary among physicians of the same department. The average length of stay can be reduced by more than 50 percent by changing the standard practice for specific cases of admissions. Maintenance has important implications for the overall technical efficiency of the hospital. Unfortunately, maintenance costs are directed mainly towards repairing hospital equipment and not towards regular and preventive maintenance, for which there are no plans. Reducing the average lengths of stay by increasing the occupancy rate would enable the turnover rate to increase and would extend hospital benefits to a greater number of people to benefit from hospital services. This study investigated the main causes of long average lengths of stay for different diagnoses.

Conclusion

Average costs are customarily used to provide data needed to rate hospital performance. Knowing the average cost only, however, is not sufficient to reach decisive conclusions regarding the sources of hospital efficiency. Ideally, a comparative study of the cost per unit of output for several hospitals would provide useful data on the hospitals that have provided optimal services with the greatest efficiency. Understandably, several minimum conditions, including quality of services provided and the clinical composition of the patients for each hospital, would have to be known to give credibility to such results.

The average length of stay (ALOS) is an important indicator of the efficiency of hospital resource utilization. Differences in the average length of stay among comparable types of departments imply differences in prevailing treatment practices across the hospital. However, without information about case mix and severity, it is difficult to use length of stay as a direct indicator of efficiency. However, stays that are unusually long raise many questions regarding efficiency and prompt a closer look at the possible causes. A performance-based incentive system that incorporates efficiency indicators as those

assessed in this cost analysis, plus additional indicators of quality of care, patient satisfaction, and rewards for the hospitals and managers that achieve outstanding gains is one feasible method for improving management.

Cost analysis (also called economic evaluation, cost allocation, efficiency assessment, cost-benefit analysis, or cost-effectiveness analysis by different authors) is currently a somewhat controversial set of methods in program evaluation. One reason for the controversy is that these terms cover a wide range of methods, but are often used interchangeably. There is continuous increase in the profits of the industry in accordance with the cost and sale proceeds.

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A Study on Analysis of Factors Affecting the Price of the Commodity Silver

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Abstract:

Commodity trading provides an ideal asset allocation, also helps one hedge against inflation and also helps buy a piece of global demand growth. The price of silver has been very volatile historically. Although the ratio of gold to silver prices has varied over the past, in recent times we observe that silver prices follow gold prices and may act as a substitute for them in the future. This article tries to identify the major factors that cause volatility in the silver prices and analyze in detail the impact of these factors on the silver prices.

Key words: Silver price, commodity market, volatility.

Introduction:

Commodity market is an important constituent of the financial market of any country. It is the market where a wide range of products, viz., precious metals, base metals, crude oil, energy and soft commodities like palm oil, coffee etc. are traded. It is important to develop a vibrant, active and liquid commodity market. This would help investors hedge their commodity risk, take speculative positions in commodities and exploit arbitrage opportunities in the market. One may have their debt and equity funds in place, but investing in commodities could just be the one element to improve their portfolio.

With this study we try to inform the investors those are interested in commodity market about the general logic of the market, specific details of the product they are going to invest and to

know the factors that affect the prices and the correlation of the product they invested with the other products.

Background of Commodity Market:

The first commodity exchange was set up in India by Bombay Cotton Trade Association Ltd. and formal organized futures trading started in cotton in 1875. Subsequently, many Exchanges came up in different parts of the country for futures trade in various commodities.

National commodity exchange

In enhancing the institutional capabilities for futures trading the idea of setting up of National Commodity Exchange(s) has been pursued since 1999. Three such Exchanges, viz, National Multi-Commodity Exchange of India Ltd., (NMCE), Ahmedabad, National Commodity & Derivatives Exchange (NCDEX), Mumbai, and Multi Commodity Exchange (MCX), Mumbai have become operational.

MCX:MCX (Multi Commodity Exchange of India Ltd.) an independent and de-mutualized multi commodity Exchange has permanent recognition from Government of India for facilitating online trading, clearing and settlement operations for commodity futures markets across the country. The Headquarters of MCX is located in Mumbai. MCX is led by an expert management team with deep domain knowledge of the commodity futures markets.

NMCE: National Multi Commodity Exchange of India Ltd. (NMCE) was promoted by Central Warehousing Corporation (CWC), National Agricultural Cooperative Marketing Federation of India (NAFED), Gujarat Agro-Industries Corporation Limited (GAICL), Gujarat State Agricultural Marketing Board (GSAMB), National Institute of Agricultural Marketing (NIAM), and Neptune Overseas Limited (NOL). While various integral aspects of commodity economy, viz., warehousing, cooperatives, private and public sector marketing of agricultural commodities, research and training were adequately addressed in structuring the Exchange, finance was still a vital missing link.

NCDEX: National Commodity and Derivatives Exchange Ltd (NCDEX) is a technology driven commodity exchange. It is a public limited company registered under the Companies Act, 1956 with the Registrar of Companies, Maharashtra in Mumbai on April 23, 2003. It has an independent Board of Directors and professionals not having any vested interest in commodity markets. It has been launched to provide a world-class commodity exchange platform for market participants to trade in a wide spectrum of commodity derivatives driven by best global practices, professionalism and transparency. NCDEX currently facilitates trading of thirty six commodities.

International Commodity Exchanges

Futures' trading is a result of solution to a problem related to the maintenance of a year round supply of commodities/ products that are seasonal as is the case of agricultural produce. The United States, Japan, United Kingdom, Brazil, Australia, Singapore are homes to leading commodity futures exchanges in the world and some of the International commodity exchanges are : The New York Mercantile Exchange (NYMEX), London Metal Exchange, The Chicago Board of Trade, Tokyo Commodity Exchange (TOCOM) and Chicago Mercantile Exchange (CME) etc.,

Silver:

Silver is a soft white precious univalent metallic element that is highly ductile and malleable having the highest electrical and thermal conductivity of any metal. It is found in the metallic state and also in a large amount of minerals mainly in argentite free form and that is why it is called argentum in Latin. Silver has attracted man's fascination for many thousands of years. A major watershed of silver production was the discovery of the New World in 1492, which was followed by the opening of major silver mines in Mexico, Bolivia, and Peru, leading to a rapid rise in the annual world production of silver. This rise, coupled with improved techniques for extracting silver from ore, broadened both the quality and quantity of ore that could be exploited. Later improvements, particularly in the late 19th and early 20th centuries, vastly enhanced the base of silver production and accelerated the exploitation of silver as a byproduct of base-metal mining. Only about 25 percent of cumulative world silver production occurred before the 1770s. Records remain incomplete for the periods before 1900; however they play a critical part in determining cumulative historical production.

Although silver is relatively scarce, it is the most plentiful and least expensive of the precious metals. The largest silver producing countries are Mexico, Peru, the United States, Australia and Chile. Sources of silver include; silver mined directly, silver mined as a by-product of gold, copper, lead and zinc mining, and silver extracted from recycled materials, primarily used photographic materials.

Basic Information about Silver:

Symbol: Ag

Silver Producing and Silver Consuming Countries

Silver Producing countries:

The below-mentioned figures are the silver production figures of the countries. Clearly, Mexico leads the list of silver producing countries. It contributes to about 15% of the world's total production. Already mentioned, only 25% of the

world's total production (i.e. 615 million ounces) comes from the primary silver mines and the rest from other sources like refining of other metals and also from scrap recycling. World silver survey done in 1998 depicts that around 152.2 million ounces of silver was separated from the waste for recycling purposes. This percentage of separated silver has improved due to advanced methods of separation. United States is the major silver producing country through scrap and waste followed by Japan.

Mexico	Peru	Australia	China
Poland	Russia	Kazakhstan	Iran
Sweden	Indonesia	Morocco	Argentina
Turkey	South Africa	Japan	India

Silver consuming countries:

The countries that are the major consumers of silver are: -

United States	Canada	Mexico
Germany	Italy	Japan
India	United Kingdom	France

Price Fluctuations in Silver for last 5 years:

Year	Traded Contract (In Lots)	Quantity (In 000's)	Unit	Total Value (In Lakhs)
2006	9498544	284956.32	KGS	50607378.39
2007	9183273	275498.19	KGS	51568068.06
2008	10972676	329180.28	KGS	70407359.66
2009	11555501	346665.03	KGS	82891095.67
2010	16440533	493215.99	KGS	159664842.35
2011	24434544	733036.32	KGS	408239010.89
2012	17284529	518535.87	KGS	297774497.73
2013	11754822	352644.66	KGS	173915829.59
2014	5692481	170774.43	KGS	71127129.42
2015	5957382	178721.46	KGS	64865456.59
2016	5572254	167167.62	KGS	69174486.91

Source: MCX India

Grading of Silver:

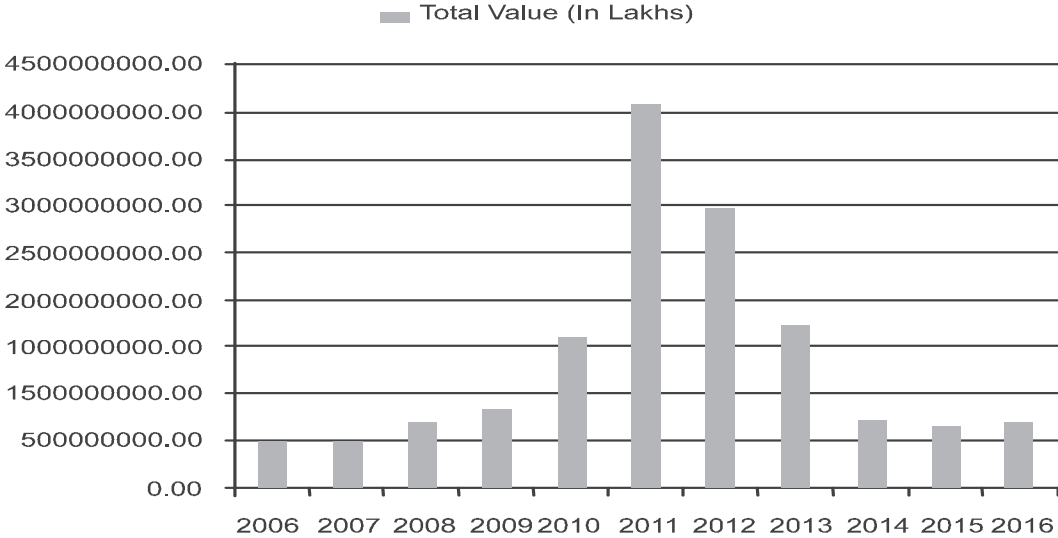
Silver that is found with some percentage of other elements in it is called impure silver. That is why it's graded upon its fineness. According to the Indian standards, silver is graded into six categories

Grade	999.9	999.5	999	970	925	916
Fineness	999.9	999.5	999	970	925	916

Contract specification for Silver Future

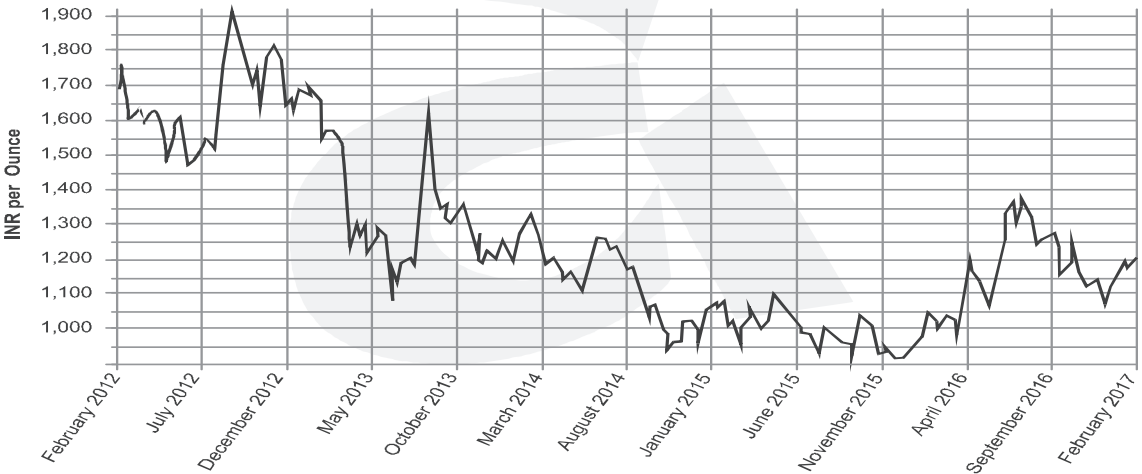
- Trading Symbol:SI
- Trading Unit: 5,000 troy ounces.
- Price Quotation:U.S. cents per troy ounce.
- Trading Hours (All times are New York time)

Open outcry trading is conducted from 8:25 AM until 1:25 PM. Electronic trading is conducted from 6:00 PM until 5:15 PM via the CME Globex® trading platform, Sunday through Friday. There is a 45-minute break each day between 5:15PM (current trade date) and 6:00 PM (next trade date).



Source: MCX India

5 Year Silver Prices In Indian Rupees (Price per ounce)



World Silver Supply and Demand

To document these and other market fundamentals, each year the Silver Institute works with GFMS Limited, of London, a leading research company, to prepare and publish an annual report of worldwide silver supply and

demand trends, with special emphasis on key markets and regions. This annual survey also includes current information on prices and leasing rates, mine production, investment and fabrication.

Supply and Demand of Silver in the world:

World silver Supply and Demand

(Million ounces)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2 0 1 5
Total Supply	917.3	890.3	908.6	916.7	1075.2	1043.3	1006.6	988.6	1053.3	1040.6
Total Physical Demand	936.3	959.6	1085.1	864.2	1036.4	1121.8	1004.6	1137.9	1131.9	1 1 7 0 . 5
Physical Surplus/Deficit	-19	-69.3	-176.6	52.5	38.8	-78.5	2	-149	-78.6	- 1 2 9 . 8
Net Balance	-136.8	-145.5	-270.7	-89.2	-83.3	-66.7	-115.5	-160.2	-71.3	-112.5
Silver price,\$ Per oz.	11.55	13.38	14.99	14.67	20.19	35.12	31.15	23.79	19.08	1 5 . 6 8

Source: World Silver Survey, 2016

Factors that Influence Silver Prices:

1. Industrial, commercial and consumer demand:

The traditional use of silver in photographic development has been dropping since 2000 due to the growth of digital photography. However, silver is also used in electrical appliances (silver is the highest known conductor of electricity), photovoltaic (one of the highest reflectors of light), clothing and medical uses (silver has antibacterial properties). Other new applications for silver include RFID tags, wood preservatives, water purification and food hygiene. The Silver Institute has seen a noticeable increase in silver-based biocide products coming onto the market, as they explain.

Currently we're seeing a surge of applications for silver-based biocides in all areas like industrial, commercial and consumer. New products are being introduced almost daily. Established companies are incorporating silver based products in current lines - clothing, refrigerators, mobile phones, computers, washing machines, vacuum cleaners, keyboards, countertops, furniture handles and more. The newest trend is the use of Nano-silver particles to deliver silver ions.

The expansion of the middle classes in emerging economies aspiring to Western lifestyles and products may also contribute to a long-term rise in industrial and jewellery usage

2. Silver supply:

Silver supply is an important factor influencing junk silver prices. Junk silver suppliers are mostly individuals turning in there and major manufacturing businesses that use silver during their technological process.

3. The Effect of Silver Stockpiling:

Silver is one the best conductors of energy which makes it an important component in most electrical devices. It is also a very good reflector of light making it valuable to producers of mirrors, windows, and other glass products. When silver prices rise, large companies that are dependent on the metal tend to hoard it. This can further drive up demand, as was the case with palladium. In 2000, the Russian supply of palladium was disrupted causing prices to rise. In response, companies who used palladium in their products began to stockpile the metal. This drove prices up to \$1,100/oz from \$330/oz previously.

4. Silver is a Byproduct Metal:

About 80% of mined silver is gathered as a byproduct of other metals, such as copper, nickel, zinc, and lead. Most of this metal comes from mines outside of the U.S. When the dollar falls against other currencies, the cost for importing

these metals rise and demand falls, driving down silver production.

5. Shorting Silver:

On the Commodity Exchange (COMEX), the silver short position is very large. In fact, silver is the world's only commodity that has a short position which is larger than both its global production and inventories.

The extent of this position has been created by naked short selling, which means shares are sold without an arrangement or promise of a borrower. This large short position helps to keep silver prices lower than they may be otherwise.

6. Countries Buying and Selling Silver:

When countries sell their reserves of silver in the market they increase the supply of silver available.

7. Mine Production:

Although the majority of silver is produced as a byproduct of other metals, 20% comes from actual silver deposits.

8. Interest Rates:

Most people don't pay too much attention to the price of silver or the consumer price index, and they might not pay too much attention to interest rates. However, they do pay attention when they see prices going up around them. If their grocery bill goes up or if their electric bill goes up they notice that.

This is evident when you look at the statistics of the consumer price index, the price of silver, and also the going rates of interest on the one year and ten year bonds. You see that in periods of time in the early seventies the interest rate was lower than the rate of inflation and so people sensed their money was being devalued and that is kind of the time when you started seeing the steep upward trend in the price of silver. Those conditions of lots of inflation and small interest rates probably had a large impact on how high the price of silver went. our government is currently doing there is a lot of pressure for them to keep interest rates low and there is pressure print up a bunch of money.

9. Hedge against financial stress

Silver, like all precious metals, may be used as a hedge against inflation, deflation or currency devaluation. As Joe Foster, portfolio manager of the New York-based Van Eck International Gold Fund, explained in September 2010.

The currencies of all the major countries, including ours, are under severe pressure because of massive government deficits. The more money that is pumped into these economies - the printing of money basically - then the less valuable the currencies become.

10. Impact of inflation on silver:

The dollar's downward spiral and concerns about inflation pushed gold and silver higher this week as investors clamored for an alternative store of value.

Gold notched a record high above \$1,569 per troy ounce, rising 4.1 per cent on the week.

Silver climbed 3.9 per cent on the week, touching a 31-year peak above \$49 per ounce that was just shy of the \$50 nominal record reached during a notorious market squeeze in 1980.

Oil also rose, with benchmark ICE June Brent closing at \$125.89 per barrel and NYMEX June West Texas Intermediate settling at \$113.93 per barrel.

11. US Dollar

From our study of the relation between silver and US Dollar we can clearly see that there exists an inverse relationship between silver prices and USD Index. During recession US Dollar is considered a safe haven, people around the world tend to disinvest in commodities and invest into US Dollar. From our analysis, we can clearly see that the prices of precious metals such as silver, palladium, titanium, etc. declines during recessionary periods. The above trend clearly suggests that silver can be used only as a long term hedge against inflation, but it cannot be used in short term as a recessionary hedge.

12. Gold Prices

Despite all of silver's fundamental drivers, gold is considered as the primary driver for silver prices. In a bullish environment, speculators tend to be interested in most of the precious metals. So it leads to an increase in the investment demand for silver. Silver having a comparatively smaller market as compared to gold, it does not take much time to drive the prices higher. At the same time when the environment is bearish, investors lose confidence in silver very fast and cause the prices to fall. From the analysis of the trend of the gold-silver ratio, it can be seen clearly that silver has a tendency to follow the prices of gold.

During the subprime crisis when the view was bearish we clearly see the trend that during the days when the prices of gold increased silver also increased. However, it would pace the gain of gold at best. During the days when the gold prices decreased we see that the silver prices plummeted by an even greater margin. Based on our hypothesis we would recommend to buy silver during a recession and to sell during a boom.

13. Oil Prices

Historically oil has shown a strong correlation with gold. Gold and silver also seem to have a stable relationship. Based on this it might be logical to conclude that oil and silver should also have a stable relationship. It has been argued that the mining of silver is an energy intensive process and hence as the oil prices rise or fall, the prices of silver would also rise or fall. This however would be over simplification as it undermines various other important factors. There is also another argument that says that silver and oil should have greater correlation than silver and gold as they are industrial elements and the factors affecting their demands would be common. However, contrary to this silver is not a perishable commodity whereas oil is.

Since the 1960's silver and oil have had a 0.7 positive correlation, this is quite strong but not as strong as of gold and oil that have a correlation

of 0.8. Our analysis of the silver and oil relationship shows that silver does have a positive correlation with oil during secular commodities bull periods and the secular bear periods.

14. Stock Indices

There is certainly some interplay between the fortunes of the stock markets and capital flowing into silver. Silver's appeal as an alternative asset is definitely higher when traditional investments are not faring well. Yet, the relationship between silver and the S&P 500 (SPX) is far more nuanced and complex than merely a direct inverse or even parallel relationship. The SPX is not, and never has been, silver's primary driver.

Running regression across top indices such as S&P 500, Dow Jones, BSE and NSE we see a common pattern emerging. The correlation between silver and the stock markets was low pre-recession. But we see that during the subprime crisis and post it, silver has been highly correlated with the stock markets. This shows the returning demand for investment in silver with the growing confidence in the markets.

15. Regulation in Silver Market

In response to various complaints from investors in recent past, CFTC has closely studied the existing controls in the market to prevent manipulation. However, there is no evidence of attempted manipulation as claimed by the complainants. The clear outperformance demonstrated by silver prices when compared to other precious metals in the recent years, shows that silver prices are not artificially depressed. The NYMEX price also trades close to the spot price thus showing that close movements are an indicator of healthy market forces in play.

Moreover, there is a slightly positive relationship between the short futures price and spot silver price, which suggests that larger short futures positions are associated with higher prices. However, still many industry experts believe that the silver market is largely controlled by only a few. These investors are suspected to have enough power to corner the market if they wish to.

Conclusion

Silver is a major precious metal, valued as a form of currency and as an industrial metal. It outpaced its other commodity counterparts-gold and platinum, growing at a rate of 58% during 2016. The primary factor that has been attributed to this strong growth is the investment driven demand for silver.

Many consider silver as a future substitute for investment in gold. However its high volatility has still remained a question of interest. The volatility can be attributed to multiple factors like gold and other precious metal prices, major stock market indices, large concentrated short position, US dollar, oil, institutional investors and industrial demand. Finally, as the lights continue to go out for the world's reserve currency, the US Dollar; trade wars escalate and threats of nationalization and the monetization of the precious metals become increasing probabilities. All these are critical factors that will impact silver in a negative and positive way - negative for those who hold a sweaty palm of Federal Reserve Notes and positive for those who have decided to own the precious metals.

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Title of the Book: "Financial Derivatives"

Author of the Book: **Prof. S.S.S. Kumar**
Associate Professor, IIM, Kozikode
Publisher: PHI Learning Pvt. Ltd.

Reviewed by: **Dr. Shweta Ahalawat**
Academic Associate, Finance Area, IIM Rohtak

The concept as well as the subject of derivatives has generated huge attention for itself within the past of few years. The learning process is usually difficult in any new subject; however, in this difficulty emanates from the lack of an appropriate textbook. Most of the textbooks that are available in the market are written in the western context and involve complex mathematics. Some sacrifices rigor for the sake of making math simple. This book "FINANCIAL DERIVATIVES" by Mr. S.S.S. Kumar, Associate Prof., IIM, Kozikode, is the earnest attempt to bridge this gap by ensuring that the perfect balance between both aspects are attained, with a strong student orientation. This book offers an absolute package of theoretical aspects and practice exercise to the readers ranging from students of prominent B- Schools to the professionals at the pinnacle of their careers.

Content

The book presents the concepts related to derivative in a simple and accessible manner, delegating complex mathematics to the appendices and focusing on intuition and appreciation, by organizing the text accordingly. The book does not sacrifice rigor or undermine the importance of mathematics, without which participating in the derivative markets is rather difficult and unthinkable.

The book begins by providing an introduction to the Derivative Markets, before proceeding towards laying the quantitative foundations. It was followed by fundamentals of financial future, forward rate agreement; interest rate future and

stock index future. Their economic benefits and risk factors have also been discussed. Last set of chapters concentrates on the financial derivatives that go by the name of "Options". The basics of options pricing model have also been elaborated which was followed by discussion regarding options hedging and trading strategies. The book has also thrown some light on foreign exchange derivatives and over the counter products. The last chapter is dedicated safely to the case studies on derivatives misfortunes.

Key features of the book

Easy to use, comprehensive, lucid, and enriched text developed to encourage critical thinking and appreciation by means of activities, tips and case studies are the hall mark of the book.

Each of the derivatives products appreciation is illustrated with the help of solved problems and practice problems.

A detailed glossary of terms and references are provided at the end of the book.

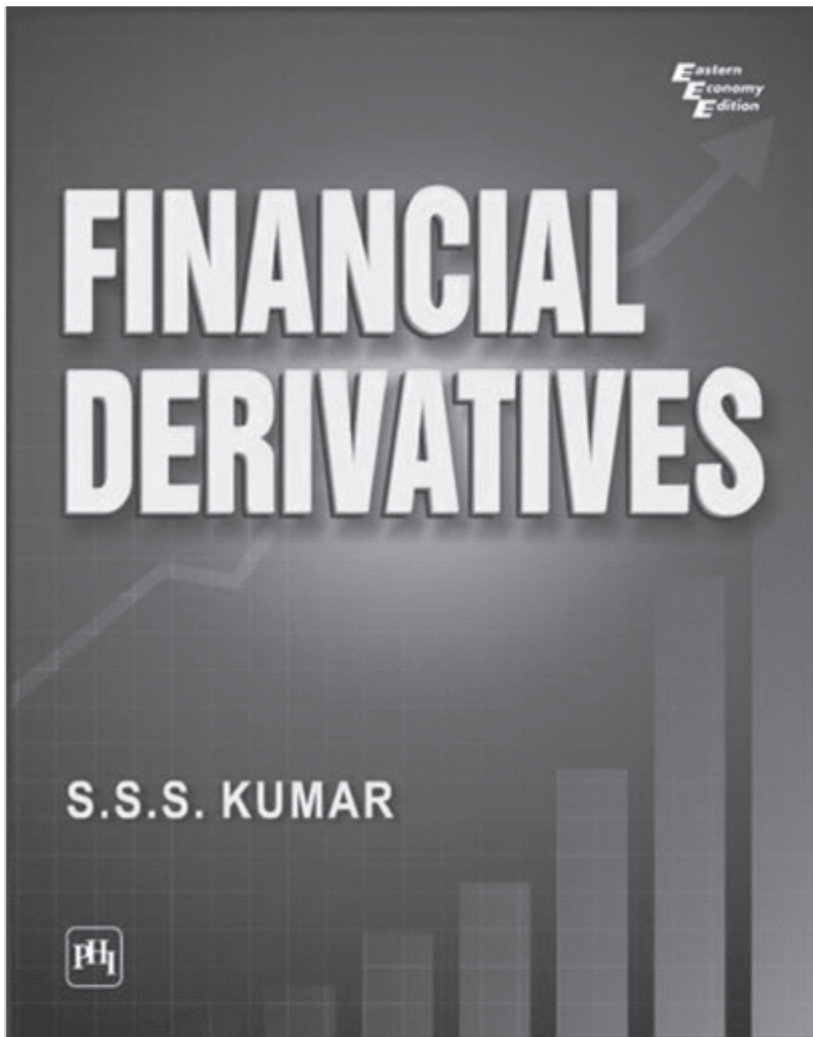
- An international approach has been taken keeping in mind the increasing globalization and financial integration.
- The language has been kept easy. A number of figures, tables, and practical illustrations have been used to make the learning process effective and enjoyable.
- Inclusion of case studies is to ensure that the students understand the concept in the practical perspective too.

Conclusion

The main purpose of this book is to give a comprehensive and basic introduction to the modeling of financial derivatives, covering the Futures, Forwards, Swaps, Options and Option pricing stretching from Black Scholes modeling to current day research on volatility. This book takes a three- pronged approach in making the subject accessible:

- Giving adequate theoretical explanations
- Providing numerical illustrations
- Including constructive case-studies

The practical approach and easy-to-understand language of the book make it a thoroughly interesting read. Derivatives have become prominent financial tools for investors looking for effective risk management strategies. Therefore, this book will give expertise in different types of derivatives and their practical applications in risk management.



Call for Papers

Theme: Ecosystem for Growth of Business

Business does not operate in isolation. Growth of business in any region, country, state or a city depends on its ecosystem. Economic, political, quality of governance, technological, socio-cultural, geographical, geopolitical, and historical factors are important components of business ecosystem. In order to understand and leverage on ecosystem for growth of business, it is essential to study and research the ecosystem. The ecosystem is not common for all sectors. The challenge is dynamic nature of the ecosystem. The complex inter-woven relationship among varied factors of ecosystems, works differently for different sectors, at different point of time in different locations. Ecosystem to be developed for growth of business needs to be researched.

In depth understanding of ecosystem enables organizations to thrive in this rapidly changing environment. The network of vendors, labor force, ancillaries, channel partners and customers constitute the core of business ecosystem. Today, every business in the ecosystem influences and gets influenced by others, creating a constantly evolving relationship. As business brings in employment, prosperity, growth and development, there is competition among different destinations for developing business. In this background, the study of ecosystem has become crucial for Governments, Corporate, International Organizations, Academicians, and all stakeholders of business. Keeping this in view, the theme of next issue is "Ecosystem for Growth of Business."

Guidelines for Publication

1. The research paper, case study and book review shall be original using specialized concepts, research methodology highlighting key insights and managerial implications.
2. Manuscripts would be checked for plagiarism.
3. The last date for submission of the manuscripts would be 15th September, 2017
4. Intimation of Acceptance/Rejection would be done by 30th September, 2017
5. No publication fees would be charged.

6. Manuscripts need to be mailed to editoramber@acharyabbs.ac.in
7. The submission must be done in Microsoft Word only.
8. The name of the author, designation, affiliation, mail id and mobile number should be provided in the first page.
9. The second page must contain the abstract and key words. The abstract should be between 150 - 250 words.
10. The third page must contain the title followed by the body of the manuscript.
11. Manuscripts are reviewed through a blind referral system by experts in the subject area. to ensure anonymity, the author's name and other details should only appear on the first page and should not be repeated anywhere else.
12. The body of the manuscript must be justified with a font size of 12 using Times New Roman font. The titles must be boldfaced.
13. The spacing between the lines must be 1.5. There must be no tab for the first sentence of every paragraph.
14. Annexure must be numbered and must follow immediately after the body of the manuscript.
15. The body of the text must contain references as shown in the bracket (Kumar, 2014), i.e., last name/surname of the author and the year of publication.
16. All references have to be arranged in alphabetic order and must be numbered.
17. The internet sources must be placed after other references and must be numbered separately.
18. The reference must be present in APA Format 6th Edition.

Example for Journal: Ampofo, A. (2014). Effects of Advertising on Consumer Buying Behaviour: With Reference to Demand for Cosmetic Products in Bangalore, India. *New Media and Mass Communication*.(27) 1-21.

Example for Book: Kotler, P. (2000), *Marketing Management* (10th ed., p. 505). Prentice Hall.

