

APPENDIX - I

QUESTIONNAIRE

Dear Sir/Madam,

This is to bring your kind information that this is an attempt to make the “*Analysis of Non-Performing Assets of Commercial Banks; with special reference to SCBNL, BOK & EBL*” for the partial fulfillment of Thesis required for MBS degree, TU. You are kindly requested to fill up the following questionnaire with the best answer in your view. I would be grateful to you for the contribution of your valuable time and effort.

Name : _____

Sex : M [] F []

Occupation (Tick One):

- Shareholders
- Borrower
- Bank Employee

Please Tick the best alternative (QN 1 to 8)

1. What should be the basis for floating loan?
 - Financial strength of borrower
 - Collateral value
 - Monitoring and Control System
 - Guarantor
 - Portfolio Management

2. In your opinion, what are the internal reasons for turning good loan into bad loan?

<input type="checkbox"/> Mismanagement	<input type="checkbox"/> Bad intention of borrower
<input type="checkbox"/> Lack of Portfolio Management	<input type="checkbox"/> Shortfall on Security
<input type="checkbox"/> Weak Legal Provision	<input type="checkbox"/> Ineffective Credit Policy

3. In your opinion, what are the external reasons for turning good loan into bad loan?

<input type="checkbox"/> Economic and Industrial Recession	<input type="checkbox"/> Conservative Provision
<input type="checkbox"/> Inconsistent Government Policy	<input type="checkbox"/> Lacking of NRB's Monitoring

4. What sector covers the more default loan?

<input type="checkbox"/> Household	<input type="checkbox"/> Business	<input type="checkbox"/> Agriculture
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5. Does NPA affect the financial health of the commercial bank?
 Yes No Don't Know
6. To what extent today's banking industry is affected by the problem of NPA?
 Not affected Nominally affected
 Moderately affected Severely affected
7. Which measure is the best option to resolve the problem of NPA?
 Strict Recovery Policy New rule and regulations
 Monitoring Rebate for timely Payment
8. If the borrower is having with overdue outstanding, the bank should start follow up;
 Within a week Within two weeks
 Within one month After one month onwards

Thank you for your time and effort.

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APPENDIX - II

Calculation of Major Financial Ratios

A) SCBNL

FY	NPA	PL	Ratio	NPA	TA	Ratio	NPA	TD	Ratio
2003/04	252.20	6441.66	3.92	252.20	23642.06	1.07	252.20	21161.44	1.19
2004/05	226.31	8194.56	2.76	226.31	21781.68	1.04	226.31	19363.47	1.17
2005/06	195.93	9010.35	2.17	195.93	25776.33	0.76	195.93	23061.03	0.85
2006/07	197.02	10593.13	1.86	197.02	28596.69	0.69	197.02	24647.02	0.80
2007/08	128.72	13835.26	0.93	128.72	33335.79	0.39	128.72	29744.00	0.43
Mean			2.33			0.79			0.89
S.D.			1.11			0.28			0.31
C.V.%			47.55			35.48			35.04
FY	LLP	LA	Ratio	LLP	NPA	Ratio	NP	NPA	Ratio
2003/04	283.62	6693.86	4.24	283.62	252.2	112.46	537.8	252.2	213.24
2004/05	277.66	8420.87	3.3	277.66	226.31	122.69	536.24	226.31	236.95
2005/06	270.86	9206.28	2.94	270.86	195.93	138.24	658.76	195.93	336.22
2006/07	287.51	10790.15	2.66	287.51	197.02	145.93	691.67	197.02	351.07
2007/08	245.38	13963.98	1.76	245.38	128.72	190.63	818.92	128.72	636.2
Mean			2.98			141.99			354.74
S.D.			0.91			30.17			168.43
C.V.%			30.38			21.25			47.48

B) BOK

FY	NPA	PL	Ratio	NPA	TA	Ratio	NPA	TD	Ratio
2003/04	399.94	5608.37	7.13	399.94	9496.34	4.21	399.94	7741.65	5.17
2004/05	308.51	5873.54	5.25	308.51	9857.13	3.13	308.51	8942.75	3.45
2005/06	203.62	7285.08	2.80	203.62	12278.33	1.66	203.62	10485.36	1.94
2006/07	243.30	9450.80	2.57	243.30	14581.39	1.67	243.30	12388.93	1.96
2007/08	236.90	12510.82	1.89	236.90	17721.92	1.34	236.90	15833.74	1.50
Mean			3.93			2.4			2.8
S.D.			2.19			1.23			1.51
C.V.%			55.86			51.14			53.96
FY	LLP	LA	Ratio	LLP	NPA	Ratio	NP	NPA	Ratio
2003/04	361.61	6008.31	6.02	361.61	399.94	90.42	127.47	399.94	31.87
2004/05	269.47	6182.05	4.36	269.47	308.51	87.35	139.53	308.51	45.23
2005/06	229.62	7488.70	3.07	229.62	203.62	112.77	202.44	203.62	99.42
2006/07	294.77	9694.10	3.04	294.77	243.30	121.15	262.39	243.30	107.85
2007/08	285.08	12747.72	2.24	285.08	236.90	120.34	361.50	236.90	152.60
Mean			3.74			106.40			87.39
S.D.			1.48			16.36			49.18
C.V.%			39.57			15.38			56.28

C) EBL

FY	NPA	PL	Ratio	NPA	TA	Ratio	NPA	TD	Ratio
2003/04	104.75	5991.09	1.75	104.75	9608.57	1.09	104.75	8063.90	1.30
2004/05	128.81	7771.28	1.66	128.81	11732.52	1.10	128.81	10097.69	1.28
2005/06	129.23	10007.02	1.29	129.23	15959.29	0.81	129.23	13802.44	0.94
2006/07	113.18	13969.50	0.81	113.18	21432.57	0.53	113.18	18186.25	0.62
2007/08	127.31	18709.12	0.68	127.31	27149.35	0.47	127.31	23976.30	0.53
Mean			1.24			0.80			0.93
S.D.			0.48			0.30			0.36
C.V.%			39.03			37.37			38.26
FY	LLP	LA	Ratio	LLP	NPA	Ratio	NP	NPA	Ratio
2003/04	211.72	6095.84	3.47	211.72	104.75	202.12	143.57	104.75	137.06
2004/05	281.42	7900.09	3.56	281.42	128.81	218.48	168.21	128.81	130.59
2005/06	334.94	10136.25	3.30	334.94	129.23	259.18	237.29	129.23	183.62
2006/07	418.60	14082.68	2.97	418.60	113.18	369.85	296.41	113.18	261.89
2007/08	497.34	18836.43	2.64	497.34	127.31	390.65	451.22	127.31	354.43
Mean			3.19			288.06			213.52
S.D.			0.38			87.00			94.62
C.V.%			11.95			30.2			44.32

Note: The data have been extracted from the annual reports of the respective banks and the mean, S.D. and C.V. have been calculated through Microsoft Excel Formulae.

APPENDIX III

A) Calculation of Correlation Coefficient and Regression line of NPA on LA of SCBNL

Year	LA X	NPA Y	$x = X - \bar{X}$	$y = Y - \bar{Y}$	x^2	y^2	xy
2003/04	6693.86	252.20	-3121.17	52.16	#####	2721.08	#####
2004/05	8420.87	226.31	-1394.16	26.27	#####	690.32	#####
2005/06	9206.28	195.93	-608.75	-4.11	370574.13	16.86	2499.52
2006/07	10790.15	197.02	975.12	-3.02	950862.91	9.10	-2940.97
2007/08	13963.98	128.72	4148.95	-71.32	#####	5085.97	#####
Total	49075.14	1000.18			#####	8523.33	#####

i) Calculation of Mean

$$\text{Mean For LA } \bar{X} = \frac{X}{5} = 9815.03 \quad \text{For NPA } \bar{Y} = \frac{Y}{5} = 200.04$$

ii) Calculation of Correlation Coefficient between LA and NPA

$$r = \frac{xy}{\dots} = \frac{-495771}{\dots} = -0.9768$$

$$\frac{x^2}{y^2} = \frac{\text{#####}}{\text{#####}}$$

iii) Calculation of Standard Deviation ()

For LA

$$s_x = \sqrt{\frac{(x-\bar{x})^2}{N-1}} = \sqrt{\frac{\text{#####}}{4}} = 2748.66$$

For NPA

$$s_y = \sqrt{\frac{(y-\bar{y})^2}{N-1}} = \sqrt{\frac{8523.3}{4}} = 46.16$$

iv) Simple Regression Equation of NPA on LA of SCBNL

$$Y - \bar{Y} = \frac{r \cdot s_y}{s_x} (X - \bar{X})$$

$$\text{or, } Y - 200.04 = \frac{0.9768 \times 46.16}{2748.66} (X - 9815.03)$$

$$\text{or, } Y - 200.04 = 0.02 X + 161.01$$

$$\text{or, } Y = 361.05 - 0.02 X$$

v) Calculation of t-value

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{(n-2)} = \frac{0.9768 \times \sqrt{5-2}}{1-0.9542} = \frac{-1.6919}{0.2140} = -7.91$$

vi) Calculation of Probable Error (P.E.)

$$P.E. = \frac{0.6745 \times (1-r^2)}{\sqrt{N}} = \frac{0.6745 \times \{1 - (-0.9768)^2\}}{\sqrt{5}} = 0.0138$$

$$\therefore 6 P.E. = 6 \times 0.0138 = 0.0829$$

Note: Same process has been adopted to find out the correlation coefficient, regression line, t-value, and probable error of between other variables of SCBNL.

B) Calculation of Correlation Coefficient and Regression line of NPA on LA of BOK

Year	LA X	NPA Y	x = X - \bar{X}	y = Y - \bar{Y}	x ²	y ²	xy
2003/04	6008.31	399.94	-2415.87	121.49	#####	#####	#####
2004/05	6182.05	308.51	-2242.13	30.06	#####	903.36	#####
2005/06	7488.70	203.62	-935.48	-74.83	875115.35	5600.13	#####
2006/07	9694.10	243.30	1269.92	-35.15	#####	1235.80	#####

2007/08	12747.72	236.90	4323.54	-41.55	#####	1726.73	#####
Total	42120.88	1392.27			#####	#####	#####

i) Calculation of Mean

$$\begin{array}{l} \text{For LA} \\ \text{Mean } \bar{X} = \frac{\sum X}{5} = 8424.18 \end{array} \qquad \begin{array}{l} \text{For NPA} \\ \bar{Y} = \frac{\sum Y}{5} = 278.45 \end{array}$$

ii) Calculation of Correlation Coefficient between LA and NPA

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{-515181}{#####} = -0.5847$$

iii) Calculation of Standard Deviation ()

$$\begin{array}{l} \text{For LA} \\ s_x = \sqrt{\frac{\sum (x-\bar{x})^2}{N-1}} = \sqrt{\frac{#####}{4}} \\ = 2830.39 \end{array} \qquad \begin{array}{l} \text{For NPA} \\ s_y = \sqrt{\frac{\sum (y-\bar{y})^2}{N-1}} = \sqrt{\frac{24224.9}{4}} \\ = 77.82 \end{array}$$

iv) Simple Regression Equation of NPA on LA of BOK

$$\begin{aligned} \bar{Y} - \bar{Y} &= \frac{r s_y}{s_x} (X - \bar{X}) \\ \text{or, } Y - 278.45 &= \frac{0.5847 \times 77.82}{2830.39} (X - 8424.18) \end{aligned}$$

$$\text{or, } Y - 278.45 = 0.02 X + 135.44$$

$$\text{or, } Y = 413.89 - 0.02 X$$

v) Calculation of t-value

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{(n-2)} = \frac{-0.5847 \times \sqrt{(5-2)}}{1 - 0.3419} = \frac{-1.0128}{0.8112} = -1.25$$

vi) Calculation of Probable Error (P.E.)

$$P.E. = \frac{0.6745 \times (1-r^2)}{\sqrt{N}} = \frac{0.6745 \times \{1 - (-0.5847)^2\}}{\sqrt{5}} = 0.1985$$

$$\therefore 6 P.E. = 6 \times 0.1985 = 1.1911$$

Note: Same process has been adopted to find out the correlation coefficient, regression line, t-value, and probable error of between other variables of BOK.

C) Calculation of Correlation Coefficient and Regression line of NPA on LA of EBL

Year	LA X	NPA Y	$x = X - \bar{X}$	$y = Y - \bar{Y}$	x^2	y^2	xy
2003/04	6095.84	104.75	-5314.42	-15.91	#####	253.00	#####
2004/05	7900.09	128.81	-3510.17	8.15	#####	66.49	#####
2005/06	10136.25	129.23	-1274.01	8.57	#####	73.51	#####
2006/07	14082.68	113.18	2672.42	-7.48	#####	55.89	#####
2007/08	18836.43	127.31	7426.17	6.65	#####	44.28	#####
Total	57051.29	603.28			#####	493.17	#####

i) Calculation of Mean

$$\text{Mean For LA } \bar{X} = \frac{X}{5} = \text{#####} \quad \text{For NPA } \bar{Y} = \frac{Y}{5} = 120.66$$

ii) Calculation of Correlation Coefficient between LA and NPA

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{74420.6}{\text{#####}} = 0.3279$$

iii) Calculation of Standard Deviation ()

$$\text{For LA } s_x = \sqrt{\frac{\sum (x-\bar{x})^2}{N-1}} = \sqrt{\frac{\text{#####}}{4}} = 5110.71$$

$$\text{For NPA } s_y = \sqrt{\frac{\sum (y-\bar{y})^2}{N-1}} = \sqrt{\frac{493.2}{4}} = 11.10$$

iv) Simple Regression Equation of NPA on LA of EBL

$$\bar{Y} - \bar{Y} = \frac{r \cdot s_y}{s_x} (X - \bar{X})$$

$$\text{or, } Y - 120.66 = \frac{0.3279 \times 11.10}{5110.71} (X - 11410.26)$$

$$\text{or, } Y - 120.66 = 0.001 X - 8.13$$

$$\text{or, } Y = 112.53 + 0.001 X$$

v) Calculation of t-value

$$t = \frac{r}{\sqrt{1-r^2}} \times \sqrt{(n-2)} = \frac{0.3279}{\sqrt{1-0.1075}} \times \sqrt{(5-2)} = \frac{0.5679}{0.9447} = 0.60$$

vi) Calculation of Probable Error (P.E.)

$$\text{P.E.} = \frac{0.6745 \times (1 - r^2)}{\sqrt{N}} = \frac{0.6745 \times \{1 - 0.3279^2\}}{\sqrt{5}} = 0.2692$$

$$\therefore \pm 6 \text{ P.E.} = 6 \times 0.2692 = 1.6153$$

Note: Same process has been adopted to find out the correlation coefficient, regression line, t-value, and probable error of between other variables of EBL.

APPENDIX – IV

A) Calculation of Multiple Regression Equation of NP on NPA and LA of SCBNL

Let NP, NPA and LA are denoted by X_1 , X_2 and X_3 respectively. Then the multiple regression equation of NP (X_1) on NPA (X_2) and LA (X_3) be;

$$X_1 = a_1 + b_1 X_2 + b_2 X_3 \dots\dots\dots (i)$$

The values of constant a_1 , b_1 and b_2 can be determined by solving following three normal equations simultaneously.

$$X_1 = na_1 + b_1 X_2 + b_2 X_3 \dots\dots\dots (ii)$$

$$X_1 X_2 = a_1 X_2 + b_1 X_2^2 + b_2 X_2 X_3 \dots\dots\dots (iii)$$

$$X_1 X_3 = a_1 X_3 + b_1 X_2 X_3 + b_2 X_3^2 \dots\dots\dots (iv)$$

X_1	X_2	X_3	$X_1 X_2$	$X_2 X_3$	$X_3 X_1$	X_2^2	X_3^2
537.8	252.2	6693.86	135633	1688191	3599958	63605	44807762
536.24	226.31	8420.87	121356	1905727	4515607	51216	70911052
658.76	195.93	9206.28	129071	1803786	6064729	38389	84755591
691.67	197.02	10790.15	136273	2125875	7463223	38817	116427337
818.92	128.72	13963.98	105411	1797444	11435383	16569	194992737
$X_1 =$ 3243.39	$X_2 =$ 1000.18	$X_3 =$ 49075.14	$X_1 X_2 =$ 627745	$X_2 X_3 =$ 9321024	$X_3 X_1 =$ 33078900	$X_2^2 =$ 208595	$X_3^2 =$ 511894479

Substituting the sum values in normal equation, we get

$$3243.39 = 5 a_1 + 1000.18 b_1 + 49075.14 b_2 \dots\dots\dots (v)$$

or, $627745 = 1000.18 a_1 + 208595 b_1 + 9321024 b_2 \dots\dots\dots (vi)$

or, $33078900 = 49075.14 a_1 + 9321024 b_1 + 511894479 b_2 \dots\dots\dots (vii)$

Multiplying (v) by 1000.18 and (vi) by 5 and then subtracting (v) from (vi), we get

$$3138723 = 5001 a_1 + 1042977 b_1 + 46605119 b_2$$

$$3243974 = 5001 a_1 + 1000360 b_1 + 49083974 b_2$$

or, $-105250 = 42617 b_1 - 2478854 b_2 \dots\dots\dots (viii)$

Again multiplying (v) by 49075.14 and (vii) by 5 and then subtracting (v) from (vii), we get

$$165394499 = 245376 a_1 + 46605119 b_1 + 2559472396 b_2$$

$$159169818 = 245376 a_1 + 49083974 b_1 + 2408369366 b_2$$

or, $6224681 = -2478854 b_1 + 151103030 b_2 \dots\dots\dots (ix)$

Again multiplying (viii) by -2478854 and (ix) by 42617 and then subtracting (viii) from (ix), we get,

$$\begin{array}{rcl}
 265275141397 & = & -105640499655 b_1 + 6439507441932 b_2 \\
 260900326375 & = & -105640499655 b_1 + 6144717756669 b_2 \\
 \hline
 \text{or, } 4374815022 & = & 294789685263 b_2 \\
 \text{or, } b_2 & = & \frac{4374815022}{294789685263} \\
 & = & 0.01
 \end{array}$$

Substituting the value of b_2 in equation (ix), we get

$$\begin{array}{rcl}
 6224681 & = & -2478854 b_1 + 151103030 \times 0.01 \\
 \text{or, } 6224681 & = & -2478854 b_1 + 2242439 \\
 \text{or, } 3982242 & = & -2478854 b_1 \\
 \text{or, } b_1 & = & \frac{3982242}{-2478854} \\
 & = & -1.61
 \end{array}$$

Again substituting the value of b_1 and b_2 in equation v, we get

$$\begin{array}{rcl}
 3243.39 & = & 5 a_1 + 1000.18 \times -1.61 + 49075.14 \times 0.01 \\
 \text{or, } 3243.39 & = & 5 a_1 - 878.48 \\
 \text{or, } 4121.87 & = & 5 a_1 \\
 \text{or, } a_1 & = & \frac{4121.87}{5} \\
 & = & 824.37
 \end{array}$$

Now substituting the values of a_1 , b_1 and b_2 in (i), we get multiple regression equation of NP (X_1) on NPA (X_2) and LA (X_3);

$$\begin{array}{rcl}
 X_1 & = & 824.37 - 1.61 X_2 + 0.01 X_3 \\
 \text{i.e. NP} & = & 824.37 - 1.61 \text{ NPA} + 0.01 \text{ LA}
 \end{array}$$

B) Calculation of Multiple Correlation Coefficient of NP on NPA and LA

Let the correlation coefficient between NP and NPA be denoted by R_{12} , NPA and LA be denoted by R_{23} and NP and LA be denoted by R_{13} and the multiple correlation coefficient on NP on NPA and LA be denoted by $R_{1.23}$.

$$R_{1.23} = \sqrt{\frac{r_{12}^2 + r_{13}^2 - 2 r_{12} r_{23} r_{13}}{1 - r_{23}^2}}$$

$$R_{NP.NPA LA} (SCBNL) = \sqrt{\frac{(-0.9646)^2 + (0.9581)^2 - 2 \times -0.9646 \times -0.9768 \times 0.9581}{1 - (-0.9768)^2}}$$

$$= \sqrt{\frac{0.9305 + 0.9180 - 1.8055}{0.0459}}$$

$$= \sqrt{\frac{0.0429}{0.0459}}$$

$$= \sqrt{0.9360}$$

$$= 0.9674$$

(Note: Same process has been adopted to calculate the multiple correlation and regression line of NP on NPA and LA of other banks)

APPENDIX- V

Calculation of Trend value of Sub-Standard Loan of SCBNL

Fiscal Year	Year X	SSL Y	$x = X - \bar{X}$	$y = Y - \bar{Y}$	x^2	y^2	xy
2003/04	1	0.00	-2.00	-13.66	4.00	186.54	27.32
2004/05	2	10.44	-1.00	-3.22	1.00	10.36	3.22
2005/06	3	16.49	0.00	2.83	0.00	8.02	0.00
2006/07	4	16.45	1.00	2.79	1.00	7.80	2.79
2007/08	5	24.91	2.00	11.25	4.00	126.61	22.50
Total	15	68.29			10.00	339.32	55.83

i) Calculation of Mean

$$\text{Mean For Year } \bar{X} = X/5 = 3.00 \quad \text{For SSL } \bar{Y} = Y/5 = 13.66$$

ii) Calculation of Correlation Coefficient between Year and SSL

$$r = \frac{xy}{x^2 y^2} = \frac{55.83}{58.25} = 0.9584$$

iii) Calculation of Standard Deviation ()

$$\begin{aligned} \text{For Year } x &= \sqrt{\frac{(x-\bar{x})^2}{N-1}} = \sqrt{\frac{10}{4}} \\ &= 1.58 \end{aligned} \quad \begin{aligned} \text{For SSL } y &= \sqrt{\frac{(y-\bar{y})^2}{N-1}} = \sqrt{\frac{339.3}{4}} \\ &= 9.21 \end{aligned}$$

iv) Simple Regression Equation of SSL on Year of SCBNL

$$\begin{aligned} Y - \bar{Y} &= \frac{r \times y (X - \bar{X})}{x} \\ \text{or, } Y - 13.66 &= \frac{0.9584 \times 1.58 (X - 3)}{1.58} \\ \text{or, } Y - 13.66 &= 5.58 X - 16.75 \\ \text{or, } Y &= -3.09 + 5.58 X \end{aligned}$$

v) Calculation of Trend value of Sub-Standard Loan of SCBNL

Year	a	b	X	Y = a + bX
2003/04	-3.09	5.58	1	2.49
2004/05	-3.09	5.58	2	8.08
2005/06	-3.09	5.58	3	13.66
2006/07	-3.09	5.58	4	19.24
2007/08	-3.09	5.58	5	24.82
2008/09	-3.09	5.58	6	30.41
2009/10	-3.09	5.58	7	35.99

Note: Same process has been adopted to find out trend value of other variables of SCBNL and other banks