

Appendix-1

1. a. Growth Ratio of Total Deposit (Rs. in Million)

Year	Nabil	SCBNL	HBL	EBL
2003/04	14119	21161.4	22010.3	8063.9
2004/05	14586.6	19363.5	24814	10097.7
2005/06	19347.4	23061	26490.9	13802.4
2006/07	23342.3	24647	30048.4	18186.2
2007/08	31915	29744	31939.87	23976.3
Growth Rate	22.62%	8.90%	9.76%	31.28%

Growth Ratio can be calculated by:

$$A_n = A_0(1 + g)^{n-1}$$

where,

A_n = Total amount in the n^{th} year

A_0 = Total amount in the initial year

g = Growth rate of the amount during the study period

n = Total no. of Study period

For Nabil

$$A_n = A_0(1 + g)^{n-1}$$

$$31915 = 14119(1+g)^{5-1}$$

$$2.26 = (1 + g)^4$$

$$1.23 = 1 + g$$

$$\therefore g = 22.63\%$$

For SCBNL

$$A_n = A_0(1 + g)^{n-1}$$

$$29744 = 21161.4(1+g)^{5-1}$$

$$1.41 = (1 + g)^4$$

$$\therefore g = 8.9\%$$

For HBL

$$A_n = A_0(1 + g)^{n-1}$$

$$31939.87 = 22010.3(1+g)^{5-1}$$

$$1.45 = (1 + g)^4$$

$$\therefore g = 9.76\%$$

For EBL

$$A_n = A_0(1 + g)^{n-1}$$

$$23976.3 = 8063.9(1+g)^{5-1}$$

$$2.97 = (1 + g)^4$$

$$\therefore g = 31.28\%$$

1. b. Growth Ratio of Loan and Advances (Rs. in Million)

Year	Nabil	SCBNL	HBL	EBL
2003/04	8190	6410	12919.6	6095.8
2004/05	10586.2	8143	13451.2	7900
2005/06	12922.5	8935	15762	10136.2
2006/07	15546	10502	17793.7	14082.7
2007/08	21365	13719	20179.6	18814.29
Growth Rate	27.09%	20.95%	11.76%	32.55%

For Nabil

$$A_n = A_0(1 + g)^{n-1}$$

$$21365 = 8190(1+g)^{5-1}$$

$$2.61 = (1 + g)^4$$

$$\therefore g = 27.09\%$$

For HBL

$$A_n = A_0(1 + g)^{n-1}$$

$$20179.6 = 12919.6(1+g)^{5-1}$$

$$1.56 = (1 + g)^4$$

$$\therefore g = 11.76\%$$

For SCBNL

$$A_n = A_0(1 + g)^{n-1}$$

$$13719 = 6410(1+g)^{5-1}$$

$$2.14 = (1 + g)^4$$

$$\therefore g = 20.95\%$$

For EBL

$$A_n = A_0(1 + g)^{n-1}$$

$$18814.29 = 6095.8(1+g)^{5-1}$$

$$3.09 = (1 + g)^4$$

$$\therefore g = 32.55\%$$

1. c. Growth Ratio of Investment (Rs. in Million)

Year	Nabil	SCBNL	HBL	EBL
2003/04	5836	11360.3	9292.1	2535.7
2004/05	4275.5	9702.5	11692.34	2128.9
2005/06	6178.5	12838.5	10889	4200.5
2006/07	8945.3	13553.2	11823	4984.3
2007/08	9939.7	13903	12752	6452.83
Growth Rate	14.24%	5.18%	8.23%	26.3%

Calculation of Growth Ratio of Investment is same as on appendix 1.a.

1. d. Growth Ratio of Interest Income (Rs. in Million)

Year	Nabil	SCBNL	HBL	EBL
2003/04	1002	1042.18	1245.9	660.2
2004/05	1069	1058.68	1446.47	719.3
2005/06	1310	1190	1626.47	903.41
2006/07	1588	1412	1775.58	1144.41
2007/08	1979	1591.2	1978.29	1548.7
Growth Rate	18.55%	11.16%	12.25%	23.81%

Calculation of Growth Ratio of Interest Income is same as on appendix 1.a.

1. e. Growth Ratio of Interest Expenses (Rs. in Million)

Year	I. R. (X)	Deposit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
Year	Nabil	SCBNL	HBL	EBL			
2003/04	282.95	275.81	491.54	316.4			
2004/05	243.54	254.13	561.96	299.6			
2005/06	357.16	303.2	648.84	401.4			
2006/07	555.71	413.06	767.41	517.2			
2007/08	758.44	471.73	823.76	632.6			
Growth Rate	27.95%	14.36%	13.78%	18.91%			

Calculation of Growth Ratio of Interest Expenses is same as on appendix 1.a.

1. f. Growth Ratio of Profit (Rs. in Million)

Year	Nabil	SCBNL	HBL	EBL
2003/04	455.31	537.8	263.05	143.5
2004/05	518.64	536.25	308.28	170.8
2005/06	635.26	658.76	457.46	237.2
2006/07	674	691.67	491.82	296.4
2007/08	746.47	818.92	654.39	491.5
Growth Rate	13.16%	11.08%	25.59%	36.04%

Here Profit = Net Profit after Tax of Profit and Loss Account of respective banks

Appendix-2

2.1 Coefficient of Correlation between Average Deposit Interest Rate and Total Deposit of Nabil Bank.

2003/04	2.8	14119	-0.49	0.240	-6543.06	42811634.2	3206.10
2004/05	3.2	14586.6	-0.09	0.008	-6075.46	36911214.2	546.79
2005/06	3.34	19347.4	0.05	0.002	-1314.66	1728330.92	-65.73
2006/07	2.93	23342.3	-0.36	0.130	2680.24	7183686.46	-964.89
2007/08	4.18	31915	0.89	0.792	11252.94	126628659	10015.12
	16.45	103310.3		1.172		215263524	12737.39

We have,

$$\bar{X} = \frac{16.45}{5} = 3.29$$

$$\bar{Y} = \frac{103310.3}{5} = 20662.06$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{12737.39}{\sqrt{1.172 \times 215263524}}$$

$$\therefore r = 0.80$$

$$\therefore r^2 = 0.64$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.64}{\sqrt{5}}$$

$$= 0.108$$

$$6P.E.r = 6 \times 0.108 = 0.65$$

2.2 Coefficient of Correlation between Average Deposit Interest Rate and Total Deposit of SCBNL.

Year	I. R. (X)	Deposit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	2.06	21161.4	0.23	0.054	-2433.98	5924258.64	-564.68
2004/05	1.75	19363.5	-0.08	0.006	-4231.88	17908808.3	330.09
2005/06	1.75	23061	-0.08	0.006	-534.38	285561.984	41.68
2006/07	1.75	24647	-0.08	0.006	1051.62	1105904.62	-82.03
2007/08	1.83	29744	0.00	0.000	6148.62	37805527.9	12.30
	9.14	117976.9		0.072		63030061.5	-262.64

We have,

$$\bar{X} = \frac{9.14}{5} = 1.83$$

$$\bar{Y} = \frac{117976.9}{5} = 23595.38$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-262.64}{\sqrt{0.072 \times 63030061.5}}$$

$$\therefore r = -0.12$$

$$\therefore r^2 = 0.015$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.015}{\sqrt{5}}$$

$$= 0.297$$

$$6P.E.r = 6 \times 0.297 = 1.78$$

2.3 Coefficient of Correlation between Average Deposit Interest Rate and Total Deposit of HBL.

Year	I. R. (X)	Deposit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	3.51	22010.3	0.52	0.275	-5050.394	25506479.6	-2646.41
2004/05	2.62	24814	-0.37	0.134	-2246.694	5047633.93	822.29
2005/06	2.73	26490.9	-0.26	0.066	-569.794	324665.202	145.87
2006/07	2.73	30048.4	-0.26	0.066	2987.706	8926387.14	-764.85
2007/08	3.34	31939.87	0.35	0.125	4879.176	23806358.4	1727.23
	14.93	135303.47		0.665		63611524.3	-715.87

We have,

$$\bar{X} = \frac{14.93}{5} = 2.99$$

$$\bar{Y} = \frac{135303.47}{5} = 27060.694$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-715.87}{\sqrt{0.665 \times 63611524.3}}$$

$$\therefore r = -0.11$$

$$\therefore r^2 = 0.0121$$

$$\begin{aligned} \text{P.E.} &= 0.6745 \times \frac{1-r^2}{\sqrt{n}} \\ &= 0.6745 \times \frac{1-0.0121}{\sqrt{5}} \\ &= 0.298 \end{aligned}$$

$$6\text{P.E.}r = 6 \times 0.298 = 1.79$$

2.4 Coefficient of Correlation between Average Deposit Interest Rate and Total Deposit of EBL.

Year	I. R. (X)	Deposit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	4.5	8063.9	0.92	0.839	-6761.44	45717070.9	-6193.48
2004/05	2.8	10097.7	-0.78	0.615	-4727.64	22350580	3706.47
2005/06	3.6	13802.4	0.02	0.000	-1022.94	1046406.24	-16.37
2006/07	3.34	18186.2	-0.24	0.060	3360.86	11295379.9	-820.05
2007/08	3.68	23976.5	0.10	0.009	9151.16	83743729.3	878.51
	17.92	74126.7		1.523		164153166	-2444.91

We have,

$$\bar{X} = \frac{17.92}{5} = 3.58$$

$$\bar{Y} = \frac{74126.7}{5} = 14825.34$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-2444.91}{\sqrt{1.523 \times 164153166}}$$

$$\therefore r = -0.15$$

$$\therefore r^2 = 0.024$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.024}{\sqrt{5}}$$

$$= 0.294$$

$$6P.E.r = 6 \times 0.294 = 1.77$$

2.5 Coefficient of Correlation between Average Lending Rate and Total Lending of Nabil.

Year	I. R. (X)	Lending (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	9.84	8190	0.47	0.219	-5531.94	30602360.2	-2588.95
2004/05	9.57	10586.2	0.20	0.039	-3135.74	9832865.3	-620.88
2005/06	9.82	12922.5	0.45	0.201	-799.44	639104.3	-358.15
2006/07	8.77	15546	-0.60	0.362	1824.06	3327194.9	-1098.08
2007/08	8.86	21365	-0.51	0.262	7643.06	58416366.2	-3913.25
	46.86	68609.7		1.083		102817891	-8579.30

We have,

$$\bar{X} = \frac{46.86}{5} = 9.37$$

$$\bar{Y} = \frac{68609.7}{5} = 13721.94$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-8579.30}{\sqrt{1.083 \times 102817891}}$$

$$\therefore r = -0.81$$

$$\therefore r^2 = 0.66$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.66}{\sqrt{5}}$$

$$= 0.102$$

$$6P.E.r = 6 \times 0.102 = 0.61$$

2.6 Coefficient of Correlation between Average Lending Rate and Total Lending of SCBNL.

Year	I. R. (X)	Lending (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	10.95	6410.24	1.25	1.573	-3131.774	9808008.4	-3927.24
2004/05	10.23	8143.21	0.53	0.285	-1398.804	1956652.6	-746.96
2005/06	9.1	8935.42	-0.60	0.355	-606.594	367956.3	361.53
2006/07	9.1	10502.6	-0.60	0.355	960.586	922725.5	-572.51
2007/08	9.1	13718.6	-0.60	0.355	4176.586	17443870.6	-2489.25
	48.48	47710.07		2.923		30499213	-7374.43

We have,

$$\bar{X} = \frac{48.48}{5} = 9.70$$

$$\bar{Y} = \frac{47710.07}{5} = 9542.014$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-7374.43}{\sqrt{2.923 \times 30499213}}$$

$$\therefore r = -0.78$$

$$\therefore r^2 = 0.61$$

$$\begin{aligned} \text{P.E.} &= 0.6745 \times \frac{1-r^2}{\sqrt{n}} \\ &= 0.6745 \times \frac{1-0.61}{\sqrt{5}} \\ &= 0.118 \end{aligned}$$

$$6\text{P.E.}r = 6 \times 0.118 = 0.71$$

2.7 Coefficient of Correlation between Average Lending Rate and Total Lending of HBL.

Year	I. R. (X)	Lending (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	10.87	12919.6	1.62	2.61	-3101.62	9620046.6	-5012.22
2004/05	9.61	13451.2	0.36	0.13	-2570.02	6605002.8	-914.93
2005/06	9.61	15762	0.36	0.13	-259.22	67195.0	-92.28
2006/07	8.1	17793.7	-1.15	1.33	1772.48	3141685.4	-2045.44
2007/08	8.08	20179.6	-1.17	1.38	4158.38	17292124.2	-4881.94
	46.27	80106.1		5.58		36726054	-12946.81

We have,

$$\bar{X} = \frac{46.27}{5} = 9.25$$

$$\bar{Y} = \frac{80106.1}{5} = 16021.22$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-12946.81}{\sqrt{5.575 \times 36726054}}$$

$$\therefore r = -0.90$$

$$\therefore r^2 = 0.82$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.82}{\sqrt{5}}$$

$$= 0.055$$

$$6P.E.r = 6 \times 0.055 = 0.33$$

2.8 Coefficient of Correlation between Average Lending Rate and Total Lending of EBL.

Year	I. R. (X)	Lending (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
------	-----------	-------------	-------------------	-------	-------------------	-------	----

2003/04	10.73	6095.8	1.55	2.403	-5309.998	28196078.8	-8230.50
2004/05	9.42	7900	0.24	0.058	-3505.798	12290619.6	-841.39
2005/06	8.45	10136.2	-0.73	0.533	-1269.598	1611879.1	926.81
2006/07	8.45	14082.7	-0.73	0.533	2676.902	7165804.3	-1954.14
2007/08	8.85	18814.29	-0.33	0.109	7408.492	54885753.7	-2444.80
	45.9	57028.99		3.635		104150135	-12544.02

We have,

$$\bar{X} = \frac{45.9}{5} = 9.18$$

$$\bar{Y} = \frac{57028.99}{5} = 11405.798$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-12544.02}{\sqrt{3.635 \times 104150135}}$$

$$\therefore r = -0.64$$

$$\therefore r^2 = 0.42$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.42}{\sqrt{5}}$$

$$= 0.176$$

$$6P.E.r = 6 \times 0.176 = 1.06$$

2.9 Coefficient of Correlation between Total Deposit and Total Credit (Lending) of Nabil.

Year	Deposit(X)	Lending(Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
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2003/04	14119	8190	-6543.06	42811634.164	-5531.94	30602360.2	36195815.34
2004/05	14586.6	10586.2	-6075.46	36911214.212	-3135.74	9832865.3	19051062.94
2005/06	19347.4	12922.5	-1314.66	1728330.916	-799.44	639104.3	1050991.79
2006/07	23342.3	15546	2680.24	7183686.458	1824.06	3327194.9	4888918.57
2007/08	31915	21365	11252.94	126628658.644	7643.06	58416366.2	86006895.60
	103310.3	68609.7		215263524.392		102817891	147193684.24

We have,

$$\bar{X} = \frac{103310.3}{5} = 20662.06$$

$$\bar{Y} = \frac{68609.7}{5} = 13721.94$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{147193684.24}{\sqrt{215263524.392 \times 102817891}}$$

$$\therefore r = 0.99$$

$$\therefore r^2 = 0.98$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.98}{\sqrt{5}}$$

$$= 0.006$$

$$6P.E.r = 6 \times 0.006 = 0.04$$

2.10 Coefficient of Correlation between Total Deposit and Total Credit (Lending) of SCBNL.

Year	Deposit(X)	Lending(Y)	x = X - \bar{X}	x²	y = Y - \bar{Y}	y²	xy
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2003/04	21161.4	6410.24	-2433.98	5924258.640	-3131.77	9808008.4	7622675.28
2004/05	19363.5	8143.21	-4231.88	17908808.334	-1398.8	1956652.6	5919570.67
2005/06	23061	8935.42	-534.38	285561.984	-606.594	367956.3	324151.70
2006/07	24647	10502.6	1051.62	1105904.624	960.586	922725.5	1010171.45
2007/08	29744	13718.6	6148.62	37805527.904	4176.586	17443870.6	25680240.21
	117976.9	47710.07		63030061.488		30499213	40556809.31

We have,

$$\bar{X} = \frac{117976.9}{5} = 23595.38$$

$$\bar{Y} = \frac{47710.07}{5} = 9542.014$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{40556809.31}{\sqrt{63030061.488 \times 30499213}}$$

$$\therefore r = 0.93$$

$$\therefore r^2 = 0.86$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.86}{\sqrt{5}}$$

$$= 0.044$$

$$6P.E.r = 6 \times 0.044 = 0.26$$

2.11 Coefficient of Correlation between Total Deposit and Total Credit (Lending) of HBL.

Year	Deposit(X)	Lending(Y)	x = X - \bar{X}	x²		y²	xy
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					$y = Y - \bar{Y}$		
2003/04	22010.3	12919.6	-5050.39	25506479.555	-3101.62	9620046.6	15664403.04
2004/05	24814	13451.2	-2246.69	5047633.930	-2570.02	6605002.8	5774048.51
2005/06	26490.9	15762	-569.79	324665.202	-259.22	67195.0	147702.00
2006/07	30048.4	17793.7	2987.71	8926387.142	1772.48	3141685.4	5295649.13
2007/08	31939.87	20179.6	4879.18	23806358.439	4158.38	17292124.2	20289467.89
	135303.47	80106.1		63611524.269		36726054	47171270.58

We have,

$$\bar{X} = \frac{135303.47}{5} = 27060.69$$

$$\bar{Y} = \frac{80106.1}{5} = 16021.22$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{47171270.58}{\sqrt{63611524.269 \times 36726054}}$$

$$\therefore r = 0.98$$

$$\therefore r^2 = 0.95$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.95}{\sqrt{5}}$$

$$= 0.014$$

$$6P.E.r = 6 \times 0.014 = 0.09$$

2.12 Coefficient of Correlation between Total Deposit and Total Credit (Lending) of EBL.

Year	Deposit(X)	Lending(Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
2003/04	8063.9	6095.8	-6761.44	45717070.874	-5310	28196078.8	35903232.88
2004/05	10097.7	7900	-4727.64	22350579.970	-3505.8	12290619.6	16574150.86
2005/06	13802.4	10136.2	-1022.94	1046406.244	-1269.6	1611879.1	1298722.58
2006/07	18186.2	14082.7	3360.86	11295379.940	2676.902	7165804.3	8996692.86
2007/08	23976.5	18814.29	9151.16	83743729.346	7408.492	54885753.7	67796295.65
	74126.7	57028.99		164153166.372		104150135	130569094.82

We have,

$$\bar{X} = \frac{74126.7}{5} = 14825.34$$

$$\bar{Y} = \frac{57028.99}{5} = 11405.798$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{130569094.82}{\sqrt{164153166.372 \times 104150135}}$$

$$\therefore r = 1.00$$

$$\therefore r^2 = 1.00$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-1.00}{\sqrt{5}}$$

$$= 0.0009$$

$$6P.E.r = 6 \times 0.0009 = 0.005$$

2.13 Coefficient of Correlation between Interest Spread (IS) and Net Profit of Nabil.

Year	I.S. (X)	Net Profit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
2003/04	4.46	455.31	-0.03	0.001	-150.626	22688.2	4.82
2004/05	5.01	518.64	0.52	0.268	-87.296	7620.6	-45.22
2005/06	4.9	635.26	0.41	0.166	29.324	859.9	11.96
2006/07	4.15	674	-0.34	0.117	68.064	4632.7	-23.28
2007/08	3.94	746.47	-0.55	0.305	140.534	19749.8	-77.57
	22.46	3029.68		0.857		55551	-129.29

We have,

$$\bar{X} = \frac{22.46}{5} = 4.49$$

$$\bar{Y} = \frac{3029.68}{5} = 605.94$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-129.29}{\sqrt{0.857 \times 55551}}$$

$$\therefore r = -0.59$$

$$\therefore r^2 = 0.35$$

$$\begin{aligned} \text{P.E.} &= 0.6745 \times \frac{1-r^2}{\sqrt{n}} \\ &= 0.6745 \times \frac{1-0.35}{\sqrt{5}} \\ &= 0.196 \end{aligned}$$

$$6\text{P.E.}r = 6 \times 0.196 = 1.17$$

2.14 Coefficient of Correlation between Interest Spread (IS) and Net Profit of SCBNL.

Year	I. S. (X)	Net Profit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
2003/04	3.76	537.8	-0.14	0.021	-110.88	12294.4	15.97
2004/05	3.7	536.25	-0.20	0.042	-112.43	12640.5	22.94
2005/06	4.1	658.76	0.20	0.038	10.08	101.6	1.98
2006/07	3.95	691.67	0.05	0.002	42.99	1848.1	1.98
2007/08	4.01	818.92	0.11	0.011	170.24	28981.7	18.05
	19.52	3243.4		0.114		55866	60.90

We have,

$$\bar{X} = \frac{19.52}{5} = 3.90$$

$$\bar{Y} = \frac{3243.4}{5} = 648.68$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{60.90}{\sqrt{0.114 \times 55866}}$$

$$\therefore r = 0.76$$

$$\therefore r^2 = 0.58$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.58}{\sqrt{5}}$$

$$= 0.126$$

$$6P.E.r = 6 \times 0.126 = 0.76$$

2.15 Coefficient of Correlation between Interest Spread (IS) and Net Profit of HBL.

Year	I. S. (X)	Net Profit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
2003/04	3.25	263.05	-0.28	0.080	-171.95	29566.8	48.49
2004/05	3.19	308.28	-0.34	0.117	-126.72	16058.0	43.34
2005/06	3.80	457.46	0.27	0.072	22.46	504.5	6.02
2006/07	3.57	491.82	0.04	0.001	56.82	3228.5	2.16
2007/08	3.85	654.39	0.32	0.101	219.39	48132.0	69.77
	17.66	2175		0.371		97490	169.77

We have,

$$\bar{X} = \frac{17.66}{5} = 3.53$$

$$\bar{Y} = \frac{2175}{5} = 435$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{169.77}{\sqrt{0.371 \times 97490}}$$

$$\therefore r = 0.89$$

$$\therefore r^2 = 0.80$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.80}{\sqrt{5}}$$

$$= 0.061$$

$$6P.E.r = 6 \times 0.061 = 0.368$$

2.16 Coefficient of Correlation between Interest Spread (IS) and Net Profit of EBL.

Year	I. S. (X)	Net Profit (Y)	$x = X - \bar{X}$	x^2	$y = Y - \bar{Y}$	y^2	xy
2003/04	4.0	143.50	0.00	0.00	-124.38	15470.4	0.00
2004/05	4.1	170.80	0.10	0.01	-97.08	9424.5	-9.71
2005/06	4.0	237.20	0.00	0.00	-30.68	941.3	0.00
2006/07	3.9	296.40	-0.10	0.01	28.52	813.4	-2.85
2007/08	4.0	491.50	0.00	0.00	223.62	50005.9	0.00
	20.00	1339.40		0.02		76655	-12.56

We have,

$$\bar{X} = \frac{20.00}{5} = 4.00$$

$$\bar{Y} = \frac{1339.40}{5} = 267.88$$

Correlation Coefficient 'r' can be calculate by using following formula

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

$$r = \frac{-12.56}{\sqrt{0.02 \times 76655}}$$

$$\therefore r = -0.034$$

$$\therefore r^2 = 0.001$$

$$P.E. = 0.6745 \times \frac{1-r^2}{\sqrt{n}}$$

$$= 0.6745 \times \frac{1-0.001}{\sqrt{5}}$$

$$= 0.301$$

$$6P.E.r = 6 \times 0.301 = 1.81$$

Appendix-3

3.1 Regression Analysis of Total Deposit (Y) on Deposit Interest Rate (X)

Year	X	Y	XY	X ²	x=(X - \bar{X})	y=(Y - \bar{Y})	xy
2003/04	3.36	233995.37	786224.44	11.29	0.38	-72023.72	-27369.01
2004/05	2.64	252409.78	666361.82	6.97	-0.34	-53609.3	18227.16
2005/06	2.85	291245.53	830049.76	8.12	-0.13	-14773.6	1920.56
2006/07	2.87	326364.43	936665.91	8.24	-0.11	20345.34	-2237.99
2007/08	3.18	426080.32	1354935.42	10.11	0.2	120061.2	24012.25
n = 5	14.9	1530095.43	4574237.35	44.70			14552.97

$$\bar{X} = \frac{\sum X}{n} = \frac{14.9}{5} = 2.98$$

$$\bar{Y} = \frac{\sum Y}{n} = \frac{1530095.43}{5} = 306019.1$$

Let the regression equation of Y on X be

$$Y = a + bx$$

To find the values of a & b we have the following two normal equations.

$$\sum Y = na + b\sum X \dots\dots\dots(i)$$

$$\sum XY = a\sum X + b\sum X^2 \dots\dots\dots(ii)$$

Substituting the value of n, $\sum Y$, $\sum X$, $\sum XY$, $\sum X^2$ in (i) and (ii) we get,

$$1530095.43 = 5a + 14.9b \dots\dots\dots (iii)$$

$$4574237.35 = 14.9a + 44.7b \dots\dots\dots (iv)$$

Now multiplying (iii) by 2.98 and then subtracting from (iv) we get

$$4574237.35 = 14.9a + 44.70b$$

$$4559684.38 = 14.9a + 44.40b$$

$$\underline{\hspace{10em} - \hspace{10em} - \hspace{10em}}$$

$$14552.97 = 0.30b$$

$$\therefore b = 48510$$

Putting the value of b in equation (iii), we get

$$1530095.43 = 5a + 722799$$

$$\therefore a = 161459.29$$

Now, substituting the value of a and b in equation $Y = a + bx$, we get required regression equation Y on X i.e.

$$Y = 161459.29 + 48510X$$

Test of Significance of the regression coefficient

Null Hypothesis: H_0 : $b = 0$ i.e. value of regression coefficient is insignificant

(Deposit interest rate does not play a significant role in deposit collection)

Alternative Hypothesis H_1 : $b \neq 0$ i.e. value of regression coefficient is significant

(Deposit interest rate plays a significant role in deposit collection)

Since the no. of observation is less than 30, we use t-test to know the significance of the regression coefficient.

Formula of t-test is given by

$$t = \frac{b}{S.E.}$$

The standard deviation of the Deposit rate

$$t^2 = \frac{\sum (X - \bar{X})^2}{n} = \frac{0.329}{5} = 0.0658$$

$$t_x = 0.26$$

The standard deviation of the Total Deposit

$$t^2 = \frac{\sum (Y - \bar{Y})^2}{n} = \frac{2310826424.5}{5} = 462165284.9$$

$$t_y = 21498$$

Correlation of Coefficient between Deposit Interest Rate and Total Deposit

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = 0.85$$

$$r^2 = 0.73$$

$$\text{Standard Error (S.E.)} = \frac{t_y}{t_x} \times \frac{\sqrt{1-r^2}}{\sqrt{n}} = 19017.46$$

Value of t when $b = 48510$ and $S.E. = 19017.46$

$$t = \frac{48510}{19017.46} = 2.55$$

Degree of freedom (d.f.) = $n-2 = 5-2 = 3$

Critical Value: the tabulated value of t at 5% level of significance for 3 d.f. is 2.353.

Decision: Since calculated value of t is higher than tabulated value of t, therefore alternative hypothesis H_1 is accepted. That is value of regression coefficient is significant. For every increase in interest rate 48510 million more deposit will be collected.

3.2 Regression Analysis of Total Lending (Y) on Lending Interest Rate

(X)

Year	X	Y	XY	X ²	x=(X - \bar{X})	y=(Y - \bar{Y})	xy
2003/04	10.8	138698.40	1502103.67	117.29	0.826	-61775.94	-51026.9
2004/05	9.95	159641.5	1588432.93	99.00	-0.054	-40832.84	2204.973
2005/06	9.82	173383.4	1702624.99	96.43	-0.184	-27090.94	4984.733
2006/07	9.7	227735	2209029.50	94.09	-0.304	27260.66	-8287.24
2007/08	9.72	302913.4	2944318.25	94.48	-0.284	102439.1	-29092.7
n=5	50	1002371.70	9946509.33	501.29			-81217.2

$$\bar{X} = \frac{\sum X}{n} = \frac{50}{5} = 10$$

$$\bar{Y} = \frac{\sum Y}{n} = \frac{1002371.7}{5} = 200474$$

Let the regression equation of Y on X be

$$Y = a + bx$$

To find the values of a & b we have the following two normal equations.

$$\sum Y = na + b\sum X \dots\dots\dots(i)$$

$$\sum XY = a\sum X + b\sum X^2 \dots\dots\dots(ii)$$

Substituting the value of n, $\sum Y$, $\sum X$, $\sum XY$, $\sum X^2$ in (i) and (ii) we get,

$$1002371.70 = 5a + 50b \dots\dots\dots (iii)$$

$$9946509.33 = 50a + 43.61b \dots\dots\dots (iv)$$

Now multiplying (iii) by 10 and then subtracting (iv) from it we get

$$10023717 = 50a + 500b$$

$$9946509.33 = 50a + 501.29b$$

$$\underline{\hspace{1.5cm} - \hspace{1.5cm} - \hspace{1.5cm}}$$

$$77207.67 = -1.29b$$

$$\therefore b = -59850.91$$

Putting the value of b in equation (iii), we get

$$1002371.70 = 5a + 50 \times -59850.91$$

$$\therefore a = 798983.41$$

Now, substituting the value of a and b in equation $Y = a + bx$, we get required

regression equation Y on X

is $Y = 798983.41 - 59850.91 X$

Test of Significance of the regression coefficient

Null Hypothesis: H_0 : $b = 0$ i.e. value of regression coefficient is insignificant

(Lending interest rate does not play a significant role in loan disbursement)

Alternative Hypothesis H_1 : $b \neq 0$ i.e. value of regression coefficient is significant

(Lending interest rate plays a significant role in loan disbursement)

Since the no. of observation is less than 30, we use t-test to know the significance of the regression coefficient.

Formula of t-test is given by

$$t = \frac{b}{S.E.}$$

The standard deviation of the Deposit rate

$$t^2 = \frac{\sum (X - \bar{X})^2}{n} = 0.178$$

$$t_x = 0.42$$

The standard deviation of the Total Deposit

$$t^2 = \frac{\sum (Y - \bar{Y})^2}{n} = 349088224.2$$

$$t_y = 18683.9$$

Correlation of Coefficient between Lending Interest Rate and Total Lending

$$r = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}} = \frac{-81217.15}{\sqrt{0.89 \times 17454411213}} = -0.65$$

$$r^2 = 0.42$$

$$\text{Standard Error (S.E.)} = \frac{t_y}{t_x} \times \frac{\sqrt{1-r^2}}{\sqrt{n}} = 15125.14$$

Value of t when $b = -59850.91$ and $\text{S.E.} = 15125.14$

$$t = \frac{-59850.91}{15125.14} = -3.96$$

Hence $|t| = 3.96$

Degree of freedom (d.f.) = $n-2 = 5-2 = 3$

Critical Value: the tabulated value of t at 5% level of significance for 3 d.f. is 2.353.

Decision: Since calculated value of t is higher than tabulated value of t, therefore alternative hypothesis H_1 is accepted. That is value of regression coefficient is significant. For every decrease in lending interest rate 59850.91 million more loan will be disburse.

In this section, population and brief introduction of the sample joint venture banks is given.

Population

- | | |
|---|--------------------------------------|
| 1. Nepal Bank Ltd. | 13. Lumbini Bank Ltd. |
| 2. Rastriya Banijya Bank Ltd. | 14. Machhapuchchhre Bank Ltd. |
| 3. NABIL Bank Ltd. | 15. Kumari Bank Ltd. |
| 4. Standard Chartered Bank Nepal Ltd | 16. Laxmi Bank Ltd. |
| 5. Nepal Investment Bank Ltd. | 17. Siddhartha Bank Ltd. |
| 6. Himalayan Bank Ltd. | 18. Agriculture Development Bank Ltd |
| 7. Nepal SBI Bank Ltd. | 19. Global Bank Limited |
| 8. Nepal Bangladesh Bank Ltd. | 20. Citizens Bank International Ltd. |
| 9. Everest Bank Ltd. | 21. Prime Commercial Bank Ltd. |
| 10. Bank of Kathmandu Ltd. | 22. Sunrise Bank Ltd. |
| 11. Nepal Credit & Commerce Bank Ltd. | 23. Bank of Asia Nepal Ltd. |
| 12. Nepal Industrial & Commercial Bank Ltd. | 24. Development Credit Bank Ltd. |
| | 25. NMB Bank Ltd. |

Sample

- 1. Nabil Bank Limited**
- 2. Standard Chartered Bank Nepal Ltd**
- 3. Himalayan Bank Ltd.**
- 4. Everest Bank Ltd.**

4.1 Nabil Bank Limited

Nabil Bank Limited, the first foreign joint venture bank of Nepal, started operations in 12th July 1984. Dubai Bank Limited, Dubai (later acquired by Emirates Bank International Limited, Dubai) was the first joint venture partner of Nabil. Currently, NB International Limited, Ireland is the foreign partner.

Nabil Bank Limited had the official name Nepal Arab Bank Limited till 31st December 2001. Nabil was incorporated with the objective of extending international standard modern banking services to various sectors of the society.

Pursuing its objective, Nabil provides a full range of commercial banking services through its 19 points of representation across the kingdom and over 170 reputed correspondent banks across the globe.

Nabil, as a pioneer in introducing many innovative products and marketing concepts in the domestic banking sector, represents a milestone in the banking history of Nepal. As it started an era of modern banking with customer satisfaction measured as a focal objective while doing business operations of the bank including day-to-day operations and risk management are managed by highly qualified and experienced management team. Bank is fully equipped with modern technology which includes ATMs, credit cards, state-of-art, world-renowned software from Infosys Technologies System, Bangalore, India, Internet banking system and Telebanking system.

This joint venture bank has been in operation with the share of following shareholders. The information has been collected as of mid July 2008.

Financial Institution = 20%

Public Ownership = 30%

Foreign Ownership = 50%

The bank is recognized as a premier financial institution in Nepal terms of its range and quality of banking services, human capital, asset quality and income. The recognition as the "Bank of the Year 2004" for Nepal by The Banker, a publication of the Financial Times, London is a testimony of this. To build on the solid foundations of its operations over the past 25 years has added to its myriad of achievements. The bank has set a mission to be the "Bank of 1st Choice" for customers, shareholders, regulators, staff and the communities it operate in.

4.2 Standard Chartered Bank Nepal Limited

Standard Chartered Bank Nepal Limited has been in operation in Nepal since 1987 when it was initially registered as a joint-venture operation. Today the Bank is an integral part of Standard Chartered Group having an ownership of 75% in the company with 25% shares owned by the Nepalese public. The Bank enjoys the status of the largest international bank currently operating in Nepal. Standard

Chartered has a history of over 150 years in banking and operates in many of the world's fastest-growing markets with an extensive global network of over 1750 branches (including subsidiaries, associates and joint ventures) in over 70 countries in the Asia Pacific Region, South Asia, the Middle East, Africa, the United Kingdom and the Americas. As one of the world's most international banks, Standard Chartered employs almost 75,000 people, representing over 115 nationalities, worldwide. This diversity lies at the heart of the Bank's values and supports the Bank's growth as the world increasingly becomes one market.

With 17 points of representation, 17 ATMs across the country and with more than 350 local staff, Standard Chartered Bank Nepal Ltd. is in a position to serve its customers through an extensive domestic network. In addition, the global network of Standard Chartered Group gives the Bank a unique opportunity to provide truly international banking services in Nepal.

Standard Chartered Bank Nepal Limited offers a full range of banking products and services in Consumer banking, Wholesale and SME Banking catering to a wide range of customers encompassing individuals, mid-market local corporates, multinationals, large public sector companies, government corporations, airlines, hotels as well as embassies, aid agencies, NGOs and INGOs.

The Bank has been the pioneer in introducing 'customer focused' products and services in the country and aspires to continue to be a leader in introducing new products in delivering superior services. It is the first Bank in Nepal that has implemented the Anti-Money Laundering policy and applied the 'Know Your Customer' procedure on all the customer accounts.

4.3 Himalayan Bank Limited

Himalayan Bank was established in 1993 in joint venture with Habib Bank Limited of Pakistan. Despite the cut-throat competition in the Nepalese Banking sector, Himalayan Bank has been able to maintain a lead in the primary banking activities- Loans and Deposits. The share participation of the bank is 65% Nepalese promoters, 15% general public and 20% Habib Bank Pakistan.

Legacy of Himalayan lives on in an institution that's known throughout Nepal for its innovative approaches to merchandising and customer service. Services such as ATMs and Tele-banking were first introduced by HBL. Therefore, HBL stand for the innovations that it brings about to help customers besides modernizing the banking sector. HBL offers besides commercial activities, also offers industrial and merchant banking facilities. The bank at present has 22 branches inside the country. The bank's policy is to extend quality and personalized service to its customers as promptly as possible.

Corporate Social Responsibility (CSR) holds one of the very important aspects of HBL. Being one of the corporate citizens of the country, HBL has always promoted social activities. Many activities that do a common good to the society have been undertaken by HBL in the past and this happens as HBL on an ongoing basis. Significant portion of the sponsorship budget of the Bank is committed towards activities that assist the society as large.

The bank's mission is to become preferred provider of quality financial services in the country. There are two components in the mission of the bank; Preferred Provider and Quality Financial Services; therefore HBL believe that the mission will be accomplished only by satisfying these two important components with the customer at focus. The bank always strives positioning itself in the hearts and minds of the customers.

4.4 Everest Bank Limited

Everest Bank Limited (EBL) was established in 1993 A.D. It started its operation from 18th October 1994 with a view and objectives of extending professionalized and efficient banking services to various segments of the society. Under the technical service agreement signed between two banks Punjab National Bank (PNB) as its joint venture partner in 1997 has been providing top management services and banking expertise to EBL. PNB has helped the bank in laying down sound system and procedures.

The local Nepalese Promoters hold 50% stake in the bank's equity, while 20% of equity is contributed by joint venture partner PNB whereas remaining 30% is held

by the public. EBL has been steadily growing in its size and operations over since its inception and today it has established itself leading private sectors bank of the nation, reckoned as one of the fastest growing commercial bank of the country. The bank is providing customer friendly services through a network of 27 branches across the nation. EBL is first private commercial bank having largest network. EBL has providing ATM service to its customers through more than 74 ATMs and over 850 Point of Sales across the country.

EBL was one of the first bank to introduce Any Branch Banking System (ABBS) in Nepal. EBL has introduced Mobile Vehicle Banking system to serve the segment deprived of proper banking facilities through its Birtamod Branch, which is the first of its kind.

The bank has been conferred with “Bank of the Year 2006, Nepal” by the banker, a publication of financial times, London. The bank was bestowed with the “NICCI Excellence award” by Nepal India chamber of commerce for its spectacular performance under finance sector.