Appendix-A

Simple correlation and regression Analysis between EPS and DPS

1) NIC Bank Ltd. (NIC)

Year	X(EPS)	Y(DPS)	XY	X2	Y2	(X- $\overline{X}$)2
2003/04	13.65	0	0	186.32	0	46.24
2004/05	22.75	10	22.7	517.56	100	5.29
2005/06	16.10	0.53	8.53	259.21	0.29	18.92
2006/07	24.01	1.05	25.21	576.48	1.10	12.67
2007/08	25.75	1.05	27.04	663.06	1.10	28.09
N=5	$\sum$ X=102.26	$\sum$ Y=12.63	$\sum$ XY= 288.28	$\sum$ x2=2202.64	$\sum$ Y2=102.49	$\sum$ (X- $\overline{X}$)2=111.22

Mean,

$\overline{X}$ = 20.45, $\overline{Y}$ =2.53

i) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$$= \frac{5x288.28 - 102.26x12.63}{\sqrt{5x2202.64} - (102.26)2\sqrt{5x102.49} - (12.63)2}$$

= 0.3382

Coefficient of Determination (r2) = 0.1144

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.3961

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.2672

ii) Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant
b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x288.28 - 102.26x12.63}{5x2202.64 - (102.26)2}$$

$= 0.2695$

$a = \overline{Y} - b\overline{X}$

= 2.53 - 0.2695 x 20.45

= -2.98

$$\text{Standard Error of Estimate (S.E.E)} = \frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$$

$$= \sqrt{\frac{102.49 - (-2.98)x12.63 - 0.2695x288.28}{5-2}}$$

= 4.56

$$\text{Standard Error of Regression Coefficient } (S_b) = \frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$$

$$= \frac{4.56}{\sqrt{111.22}}$$

= 0.4324

$$\text{t-value}, |t| = \frac{b}{Sb}$$

= 0.6233

2) NABIL Bank Ltd. (NABIL)

Year	X (EPS)	Y(DPS)	XY	X2	Y2	(X-Y)2
2003/04	92.61	65	6019.65	8576.61	4225	480.92
2004/05	105.49	70	7384.3	11128.14	4900	81.90
2005/06	129.21	85	10982.85	16695.22	7225	215.21
2006/07	137.08	100	13708	18790.93	10000	508.05
2007/08	108.31	100	10831	11731.06	10000	38.81
N=5	$\sum$ X=572.7	$\sum$ Y=420	$\sum$ XY=48925.8	$\sum$ X2=66921.96	$\sum$ Y2=36350	$\sum(x-\overline{X})2$ =1324.89

Mean,

$\overline{X}$ = 114.54, $\overline{Y}$ = 84

i) Coefficient of correlation (r) = $\dfrac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$$= \frac{5x48925.8-572.7x420}{\sqrt{5x66921.96-(572.7)2}.\sqrt{5x36350-(420)2}}$$

= 0.6879

Coefficient of Determination (r2) = 0.4732

Standard Error of correlation coefficient, S.E. (r) = $\dfrac{1-r2}{\sqrt{n}}$

= 0.2356

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\dfrac{1-r2}{\sqrt{n}}$

= 0.1589

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \text{ and } \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY-\sum X.\sum Y}{n\sum X2-(\sum X)2}$$

$$= \frac{5x48925.8 - 572.7x420}{5x66921.96 - (572.7)2}$$

= 0.6182

a = $\overline{Y} - b\overline{X}$

= 84 - 0.6182 x 114.54

= 13.1914

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \frac{\sqrt{36350 - 13.194x420 - 0.6182x48952.8}}{5-2} -$$

= 13.7074

Standard Error of Regression Coefficient (Sb) = $\frac{S.E.E.}{\sqrt{\sum(X - \overline{X})2}}$

$$= \frac{13.7074}{\sqrt{\sum 1324.89}}$$

= 0.3766

t-value, $|t| = \frac{b}{Sb}$

= 1.6415

3) Bank of Kathmandu Ltd. (BOK)

Year	X (EPS)	Y(DPS)	XY	X2	Y2	(X- $\overline{X}$)2
2003/04	27.5	10	275	756.25	100	180.63
2004/05	30.10	15	451.5	906.01	225	117.51
2005/06	43.67	18	786.06	1907.07	324	7.45
2006/07	43.50	20	870	1892.25	400	6.55
2007/08	59.94	2.11	126.47	3592.80	4.45	361
N=5	$\sum$ X=204.71	$\sum Y2 =$ 65.11	$\sum$ XY=2509.03	$\sum$ X2=9054.38	$\sum$ Y2=1053.45	$\sum(X - \overline{X})2$ =6 73.15

Mean,

$\overline{X}$ = 40.94, $\overline{Y}$ = 13.02

i) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x2509.03 - 204.71x65.11}{\sqrt{5x9054.38 - (204.71)2}\sqrt{5x1053.45 - (65.11)2}}$$

= -0.4213

Coefficient of Determination (r^2) = 0.1775

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

= 0.3678

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.2481

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x2509.03 - 204.71x65.11}{5x9054.38 - (204.71)2}$$

= -0.2328

$$a = \overline{Y} - b\overline{X}$$

= 13.02-(-0.2328) x 40.94

= 22.5508

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n - 2}$

$$= \sqrt{\frac{1053.45 - 22.5508x65.11 - (-.2328)x2509.03}{5 - 2}}$$

= 7.5115

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{7.5115}{\sqrt{673.15}}$$

= 0.2895

t-value, $|t|$ = $\frac{b}{Sb}$

= 0.8041

4) Pooled Bank Average

Year	X (EPS)	Y(DPS)	XY	X2	Y2	$(X-\overline{X})2$
2003/04	44.59	25	1115	1988.3	62.5	199.1
2004/05	52.78	31.67	1671.5	2785.73	1003	35.05
2005/06	63	34.51	2174.1	3639	1191	18.5
2006/07	68.2	40.35	2752	4651.24	1628.12	90.3
2007/08	64.67	34.39	2224	4182.21	1182.67	35.64
N=5	$\sum$ X=293.24	$\sum Y2 =$ 165.92	$\sum$ XY=9936.3	$\sum$ X2=17576.44	$\sum$ Y2=5629.72	$\sum(X-\overline{X})2$ =378.52

Mean,

$\overline{X}$ = 58.7, $\overline{Y}$ = 33.2

i) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

= $\frac{5x9936.3 - 293.24x165.92}{\sqrt{5x17576.44 - (293.24)2}\sqrt{5x5629.72 - (165.92)2}}$

= 0.9483

Coefficient of Determination (r2) = 0.8992

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.045

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.0304

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

b = $\frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$

$$= \frac{5x9936.3 - 293.24x165.92}{5x17576.44 - (293.24)2}$$

= 0.5427

$$a = \bar{Y} - b\bar{X}$$

= 33.2 - 0.5427 x 58.7

= 1.344

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{5629.72 - 1.344x165.92 - 0.5427x9936.3}{5-2}}$$

= 0.1122

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \bar{X})2}}$

$$= \frac{0.1122}{\sqrt{378.52}}$$

= 0.2895

t-value, $|t| = \frac{b}{Sb}$

= 4.84

Appendix-B

Simple correlation and Regression analysis between DPR and MPS

1) NIC Bank Ltd. (NIC)

Year	**X (EPS)**	**Y(MPS)**	**XY**	**X2**	**Y2**	**(X- $\bar{X}$)2**
2003/04	0	218	0	0	47524	124.10
2004/05	543.96	366	1689.36	1932.48	133956	1077.15
2005/06	3.29	496	1631.84	10.82	246016	61.62
2006/07	4.37	950	4151.5	19.10	902500	45.83
2007/08	4.08	1284	5238.72	16.65	1648656	49.84
N=5	$\sum$ X=55.7	$\sum Y =$ 3314	$\sum$ XY=27111.42	$\sum$ X2=1979.05	$\sum$ Y2=2978652	$\sum (X - \bar{X})2$ =1358.55

Mean,

$\bar{X}$ = 11.14, $\bar{Y}$ = 662.8

i) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x27111.42 - 55.7x3314}{\sqrt{5x1979.05 - (55.70)2}\sqrt{5x2978652 - (3314)2}}$$

= -0.3008

Coefficient of Determination (r^2) = 0.0905

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

= 0.4067

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.2743

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x27111.42 - 55.7x3314}{5x1979.05 - (55.70)2}$$

= -7.2184

$$a = \overline{Y} - b\overline{X}$$

= 662.8-(-7.2184) x 11.14

= 743.213

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n - 2}$

$$= \sqrt{\frac{2978652 - 743..213x3314 - (-7.2184)x27111.42}{5 - 2}}$$

= 486.9446

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{486.9446}{\sqrt{1358.55}}$$

= 13.2112

t-value, $|t| = \frac{b}{Sb}$

= 0.5464

2) NABIL Bank Ltd. (NABIL)

Year	X (EPS)	Y(MPS)	XY	X2	Y2	(X- $\overline{X}$)2
2003/04	70.19	1000	70190	0	47524	124.10
2004/05	66.36	1505	99871.8	1932.48	133956	1077.15
2005/06	65.78	2240	147347.2	10.82	246016	61.62
2006/07	72.95	5050	368397.5	19.10	902500	45.83
2007/08	92.33	5275	487040.75	16.65	1648656	49.84
N=5	$\sum$ X=367.61	$\sum Y =$ 15070	$\sum$ XY=1172847.25	$\sum$ X2=27503.83	$\sum$ Y2=61610750	$\sum (X - \overline{X})2$ =476.40

Mean,

$\overline{X}$ = 73.52, $\overline{Y}$ = 3014

i) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

= $\frac{5x1172847.25 - 367.61x15070}{\sqrt{5x27503.83 - (367.61)2}\sqrt{5x61610750 - (15070)2}}$

= 0.5455

Coefficient of Determination (r_2) = 0.5455

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

= 0.2033

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.1371

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \text{ and } \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x1172847.25 - 367.61x150750}{5x27503.83 - (367.61)2}$$

= 136.1664

$$a = \overline{Y} - b\overline{X}$$

= 3014-136.1664 x 73.52

= -6996.9537

$$\text{Standard Error of Estimate (S.E.E)} = \frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$$

$$= \sqrt{\frac{61610750 - 6996.9537x150750 - 1172847.25x136.1664}{5-2}}$$

= 1565.51

$$\text{Standard Error of Regression Coefficient } (S_b) = \frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$$

$$= \frac{1565.51}{\sqrt{476.40}}$$

= 71.7248

$$\text{t-value, } |t| = \frac{b}{Sb}$$

= 1.8985

3) Bank of Kathmandu Ltd. (BOK)

Year	**X (EPS)**	**Y(MPS)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	36.36	295	10726.2	1322.05	87025	0.96
2004/05	49.83	430	21426.9	2483.03	184900	208.8
2005/06	41.22	850	35037	1699.09	722500	34.11
2006/07	45.98	1375	63222.5	2114.16	1890625	112.36
2007/08	3.52	2350	8272	12.39	5522500	1015.06
N=5	$\sum$ X=176.91	$\sum Y =$ 5300	$\sum$ XY=138684.6	$\sum$ X2=7630.72	$\sum$ Y2=8407550	$\sum (X - \overline{X})2$ =1371.29

Mean,

$\overline{X}$ = 35.38, $\overline{Y}$ = 1060

$$\text{i) Coefficient of correlation (r)} = \frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$$

$$= \frac{5x138684.6 - 176.91x5300}{\sqrt{5x7360.72 - (176.91)2}\sqrt{5x8407550 - (5300)2}}$$

= -0.7897

Coefficient of Determination (r^2) = 0.5455

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

= 0.1683

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.1135

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x138684.6 - 176.91x5300}{5x7630.72 - (176.91)2}$$

= -35.6161

$$a = \overline{Y} - b\overline{X}$$

= 1060-(-35.6161) x 35.38

= 2320.0976

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n - 2}$

=

$$\sqrt{\frac{8407550 - 2320.0976x5300 - 138684.6x(-35.6161)}{5 - 2}}$$

= 591.7292

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{591.7292}{\sqrt{1371.29}}$$

= 15.9793

t-value, $|t| = \frac{b}{Sb}$ = 2.2289

4) Pooled Bank Average

Year	X (DPR)	Y(MPS)	XY	X2	Y2	(X-Y)2
2003/04	35.52	504.33	1791.80	1261.67	254348.75	20.16
2004/05	53.38	767	40942.46	2849.42	588289	178.76
2005/06	36.76	1195.33	43940.33	1351.30	1428813.81	10.56
2006/07	41.1	2458.33	101037.36	1689.21	6043386.4	1.19
2007/08	33.31	2970	98930.70	1109.56	8820900	44.89
N=5	$\sum X$ =200.07	$\sum Y$ =7895	$\sum XY$ =302764.66	$\sum$ X2=8261.16	$\sum$ Y2=17135737.95	$\sum(X-\overline{X})2$ =255.56

Mean,

$\overline{X}$ = 40.01, $\overline{Y}$ = 1579

i) Coefficient of correlation (r) = $\dfrac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$= \dfrac{5x302764.66-200.07x7895}{\sqrt{5x8261.16-(200.07)2}.\sqrt{5x17135737.95-(7895)2}}$

= -0.3805

Coefficient of Determination (r_2) = 0.0.1448

Standard Error of correlation coefficient, S.E. (r) = $\dfrac{1-r2}{\sqrt{n}}$

= 0.3825

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\dfrac{1-r2}{\sqrt{n}}$

= 0.258

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

b = $\dfrac{n\sum XY-\sum X.\sum Y}{n\sum X2-(\sum X)2}$

$$= \frac{5x302764.66 - 200.07x7895}{5x8261.16 - (200.07)2}$$

= -51.4397

a = $\overline{Y} - b\overline{X}$

= 1597-(-51.4397) x 40.01

= 3637.1024

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{17135737.95 - 3637.1024x7895 - 302764.66x(-51.4397)}{5-2}}$$

= 1154

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{1154}{\sqrt{255.56}}$$

= 72.1852

t-value, $|t| = \frac{b}{Sb}$

= 0.7126

Appendix-C

Simple correlation and Regression analysis between DPS and Net Worth

1) **NIC Bank Ltd (NIC)**

Year	X (DPS)	Y(NW)	XY	X2	Y2	(X- $\bar{X}$)2
2003/04	0	124.09	0	0	15398.33	6.4009
2004/05	10	136.84	1368.4	100	18725.19	55.8009
2005/06	.53	116.13	61.55	0.28	13486.18	4
2006/07	1.05	139.17	146.13	1.10	19368.29	2.1904
2007/08	1.05	138.09	145	1.10	19068.85	2.1904
N=5	$\sum$ X=12.63	$\sum Y$ =654.32	$\sum$ XY=1721.08	$\sum$ X2=102.48	$\sum$ Y2=86046.84	$\sum(X-\bar{X})2$ =70.5826

Mean,

$\bar{X}$ = 2.53, $\bar{Y}$ = 130.86

i) Coefficient of correlation (r) = $\dfrac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$= \dfrac{5X1721.08-12.63X654.32}{\sqrt{5X102.48-(12.63)2}\sqrt{5X86046.84}-(654.32)2}$

= 0.3996

Coefficient of Determination (r_2) = 0.1573

Standard Error of correlation coefficient, S.E. (r) = $\dfrac{1-r2}{\sqrt{n}}$

= 0.3769

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\dfrac{1-r2}{\sqrt{n}}$

= 0.2542

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5X1721.08 - 12.63X654.325}{5X102.48 - (12.63)2}$$

= 0.9673

$$a = \overline{Y} - b\overline{X}$$

= 130.86-0.9673 x 2.53

= 128.4127

Standard Error of Estimate (S.E.E) = $\sqrt{\frac{\sum Y2 - a.\sum Y - b.\sum XY}{n-2}}$

$$= \sqrt{\frac{86046.84 - 128.4127X654.32 - 0.9673X1721.08}{5-2}}$$

=10.9399

Standard Error of Regression Coefficient (Sb) = $\frac{S.E.E.}{\sqrt{\sum(X - \overline{X})2}}$

$$= \frac{10.9399}{\sqrt{70.5826}}$$

= 1.3022

t-value, $|t| = \frac{b}{Sb}$

= 0.7428

2) NABIL Bank Ltd (NABIL)

Year	**X (DPS)**	**Y(NW)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	65	301	19565	4225	90601	361
2004/05	70	337	23590	4900	113569	196
2005/06	85	381	32385	7225	145161	1
2006/07	100	418	41800	10000	174724	256
2007/08	100	354	35400	10000	125316	2.256
N=5	$\sum$ X=420	$\sum Y$ =1791	$\sum$ XY=152740	$\sum$ X2=36350	$\sum$ Y2=649371	$\sum(X - \overline{X})2$ =1070

Mean,

$\overline{X}$ = 84 $\overline{Y}$ = 358.2

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x152740 - 420x1791}{\sqrt{5x36350 - (420)2}\sqrt{5x649371 - (1791)2}}$$

= 0.7930

Coefficient of Determination (r_2) = 0.7486

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

=.1659

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.1119

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x152740 - 420x1791}{5x36350 - (420)2}$$

= 2.1458

a = $\overline{Y} - b\overline{X}$

= 358.2 -2.1458 x 84

= 177.95

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n - 2}$

$$= \sqrt{\frac{649371 - 177.95X1791 - 2.1458X152740}{5 - 2}}$$

= 33.16

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum(X - \overline{X})2}}$

$$= \frac{1.3443}{\sqrt{476.4}}$$

= 0.9526

t-value, $|t| = \frac{b}{Sb}$

= 2.253

3) Bank of Kathmandu Ltd. (BOK)

Year	X (DPS)	Y(NW)	XY	X2	Y2	(X- $\bar{X}$)2
2003/04	10	218.4	2184	100	47689.8	9.12
2004/05	15	213.6	3204	225	4562.5	3.92
2005/06	18	230.7	4152	324	53208.6	24.80
2006/07	20	164.7	3294	400	27119.5	48.72
2007/08	2.11	222.5	470	4.4	49511	119
N=5	$\sum$ X=65.11	$\sum Y$ = 1050	$\sum$ XY=13303	$\sum$ X2=1053	$\sum$ Y2=223154	$\sum(X-\bar{X})2$ =205.6

Mean,

$\bar{X}$ = 13.02 $\bar{Y}$ = 210

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x13303 - 65.11x1050}{\sqrt{5x1053 - (65.11)2}\sqrt{5x223154 - (1050)2}}$$

= -0.5011

Coefficient of Determination (r2) = 0.2511

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

=0.3349

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= .2259

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x13303 - 65.11x1050}{5x1053.45 - (65.11)2}$$

= -1.8

a = $\overline{Y} - b\overline{X}$

= 210- (-1.8) x 13.02

= 233.44

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{223154 - 233.44X1050 - (-1.8)X13303}{5-2}}$$

= 25.74

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{25.74}{\sqrt{205.6}}$$

= 1.7952

t-value, $|t| = \frac{b}{Sb}$

= 1.003

4) Pooled Bank Average

Year	**X (DPS)**	**Y(NW)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	25	214.5	5362.5	625	46010	678
2004/05	31.67	229.1	7256	1003	52487	2.3
2005/06	34.51	242.6	8372	1191	58855	1.79
2006/07	4035	241	9724	1628	58081	51.4
2007/08	34.39	238	8185	1183	56644	1.5
N=5	$\sum$ X=166	$\sum Y$ =1165	$\sum$ XY=38899	$\sum$ X2=5630	$\sum$ Y2=272077	$\sum (X - \overline{X})2$ =123.83

Mean,

$\overline{X}$ = 33.18 $\overline{Y}$ = 233

ii) Coefficient of correlation (r) = $\frac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$$= \frac{5x38899-166x1165}{\sqrt{5x5630-(166)2}\sqrt{5x272077-(123.83)2}}$$

= 0.8066

Coefficient of Determination (r2) = 0.6506

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.1562

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.1054

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY-\sum X.\sum Y}{n\sum X2-(\sum X)2}$$

$$= \frac{5x38899-166x1165}{5x5630-(166)2}$$

= 1.86

a = $\overline{Y} - b\overline{X}$

= 233- 1.86 x 33.18

= 171.28

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{272077-171.28X1165-1.86X38899}{5-2}}$$

= 7.824

Standard Error of Regression Coefficient (Sb) = $\frac{S.E.E.}{\sqrt{\sum(X-\overline{X})2}}$

$$= \frac{7.824}{\sqrt{123.83}}$$

= 0.703

t-value, $|t| = \frac{b}{Sb}$

= 2.6458

Appendix-D

Simple correlation and Regression analysis between DPS and MPS

1) NIC Bank Ltd (NIC)

Year	**X (DPS)**	**Y(MPS)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	0	218	0	0	47524	6.4009
2004/05	10	366	3660	100	133956	55.8009
2005/06	0.53	496	262.88	0.2809	246016	4
2006/07	1.05	950	997.5	1.1025	902500	2.1904
2007/08	1.05	1284	1348.2	1.1025	1648656	2.1904
N=5	$\sum$ X=12.63	$\sum Y$ =3314	$\sum$ XY=6268.58	$\sum$ X2=102.49	$\sum$ Y2=2978652	$\sum(X-\overline{X})2$ =70.5826

Mean,

$\overline{X}$ = 2.53 $\overline{Y}$ = 662.8

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$= \frac{5x6268.58 - 12.63x3314}{\sqrt{5x102.49-(12.63)2}\sqrt{5x29786.52-(3314)2}}$

= -0.283

Coefficient of Determination (r2) = 0.0801

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.4114

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.2775

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x6268.58 - 12.63x3314}{5x102.49 - (12.63)2}$$

= -29.7873

a = $\overline{Y} - b\overline{X}$

= 662.8-(-29.7873) x 2.53

= 738.1619

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{2978652 - 738.1619X3314 - (-29.7873)X6268.58}{5-2}}$$

= 489.59

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{489.59}{\sqrt{70.5826}}$$

= 58.2752

t-value, $|t| = \frac{b}{Sb}$

= 0.5111

2) NABIL Bank Ltd (NABIL)

Year	**X (DPS)**	**Y(MPS)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	65	1000	65000	4225	1000000	361
2004/05	70	1505	105350	4900	2265025	196
2005/06	85	2240	190400	7225	5017600	1
2006/07	100	5050	505000	10000	25502500	256
2007/08	100	5257	527500	10000	27825625	256

N=5	$\sum$ X=420	$\sum Y = 15070$	$\sum$ XY=1393250	$\sum$ X2=36350	$\sum$ Y2=61610750	$\sum (X - \overline{X})2$ =1070

Mean,

$\overline{X}$ = 84 $\overline{Y}$ = 3014

ii) Coefficient of correlation (r) = $\dfrac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x1393250 - 420x15070}{\sqrt{5x36350 - (420)2}\sqrt{5x61610750 - (15070)2}}$$

= 0.9677

Coefficient of Determination (r2) = 0.9365

Standard Error of correlation coefficient, S.E. (r) = $\dfrac{1 - r2}{\sqrt{n}}$

= 0.0284

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\dfrac{1 - r2}{\sqrt{n}}$

= 0.0192

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x1393250 - 420x15070}{5x36350 - (420)2}$$

= 119.037

a = $\overline{Y} - b\overline{X}$

= 3014-119.037 x 84

= -6985.11

Standard Error of Estimate (S.E.E) = $\dfrac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n - 2}$

=

$$\sqrt{\frac{61610750 - (-6985.11)X15070 - 119.037X1393250}{5 - 2}}$$

= 585.4

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum(X-\overline{X})2}}$

$= \frac{585.4}{\sqrt{1070}}$

= 17.896

t-value, $|t| = \frac{b}{Sb}$

= 6.652

3) Bank of Kathmandu Ltd (BOK)

Year	X (DPS)	Y(MPS)	XY	X2	Y2	(X- $\overline{X}$)2
2003/04	10	295	2950	100	87025	87025
2004/05	15	430	6450	225	184900	3.9204
2005/06	18	850	15300	324	722500	24.80
2006/07	20	1375	27500	400	1890625	48.72
2007/08	2.11	2350	4958.5	4.4521	5522500	119.03
N=5	$\sum$ X=65.11	$\sum Y$ =5300	$\sum$ XY=57158.5	$\sum$ X2=1053.41	$\sum$ Y2=8407550	$\sum(X-\overline{X})2$ =205.29

Mean,

$\overline{X}$ = 13.02 $\overline{Y}$ = 1060

ii) Coefficient of correlation (r) = $\frac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$= \frac{5x57158.5-65.11x5300}{\sqrt{5x1053.41-(65.1)2}\sqrt{5x8407550-(5300)2}}$

= -0.4952

Coefficient of Determination (r_2) = 0.2452

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.0284

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.2277

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x57158.5 - 65.11x5300}{5x1053.45 - (65.11)2}$$

= -57.6791

$a = \overline{Y} - b\overline{X}$

= 1060-(-57.6791) x 13.02

= 1810.9819

$$\text{Standard Error of Estimate (S.E.E)} = \frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$$

$$= \sqrt{\frac{8407550 - 1810.9819X5300 - (-57.6791)X57158.5}{5-2}}$$

= 837.89

$$\text{Standard Error of Regression Coefficient (S}_b\text{)} = \frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$$

$$= \frac{837.89}{\sqrt{205.59}}$$

= 58.44

$$\text{t-value}, |t| = \frac{b}{Sb}$$

= -0.987

4) Pooled Bank Average

Year	X (DPS)	Y(MPS)	XY	X2	Y2	(X- $\overline{X}$)2
2003/04	25	504.33	12608.25	625	254348.7	66.9124
2004/05	31.67	767	24290.89	1003	588289	2.28
2005/06	34.51	1195.33	41250.84	1190.9	14228814	1.7889
2006/07	40.35	2458.33	99193.62	1628.12	6043386	51.4089
2007/08	34.39	2970	102138.3	1182.67	8820900	1.46
N=5	$\sum$ X=165.92	$\sum Y$ =7895	$\sum$ XY=279482	$\sum$ X2=5629.72	$\sum$ Y2=17135738	$\sum (X - \overline{X})2$ =123.83

Mean,
$\overline{X}$ = 33.18 $\overline{Y}$ = 1579

ii) Coefficient of correlation (r) = $\frac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$$= \frac{5x279482-165.92x7895}{\sqrt{5x5629.72-(165.92)2}\sqrt{5x17135738-(7895)2}}$$

= 0.7276

Coefficient of Determination (r_2) = 0.5294

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.2105

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.1419

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY-\sum X.\sum Y}{n\sum X2-(\sum X)2}$$

$$= \frac{5x279482-165.92x7895}{5x5629.72-(165.92)2}$$

= 141.2761

a = $\overline{Y} - b\overline{X}$

= 1579-141.2761 x 33.18

= -3108.54

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2-a\sum Y-b\sum XY}}{n-2}$

$$= \sqrt{\frac{17135738-(-3108.54)X7895-141.2761X279482}{5-2}}$$

= 855.09

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X-\overline{X})2}}$

$= \frac{855.09}{\sqrt{123.83}}$

= 76.84

t-value, $|t| = \frac{b}{Sb}$

= 1.8386

Appendix-E

Simple correlation and Regression analysis between DPR and Net Profit

1) NIC Bank Ltd. (NIC)

Year	**X (DPR)**	**Y(Net profit)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	0	293	0	0	858.5	124.10
2004/05	43.96	38.9	1710	1932.48	1513.2	1077.15
2005/06	3.29	30.7	101	10.82	942.5	61.62
2006/07	4.37	38.6	168.7	19.10	1490	43.83
2007/08	4.08	44.49	48.05	16.65	1979.4	49.84
N=5	$\sum$ X=55.7	$\sum Y$ =182	$\sum$ XY=2028	$\sum$ X2=1979.05	$\sum$ Y2=6784	$\sum (X-\overline{X})2$ =1358.58

Mean,

$\overline{X}$ = 11.14 $\overline{Y}$ = 36.4

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$= \frac{5x2028 - 55.7x182}{\sqrt{5x1979.05 - (55.7)2}\sqrt{5x6784 - (182)2}}$

= 0.0011

Coefficient of Determination (r_2) = 0.00000125

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.4472

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.3016

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x2028 - 55.7x182}{5x1979.05 - (55.70)2}$$

= 0.00038

$a = \overline{Y} - b\overline{X}$

= 36.4 – 0.00038 x 11.14

= 36.3957

Standard Error of Estimate (S.E.E) = $\sqrt{\dfrac{\sum Y2 - a\sum Y - b\sum XY}{n-2}}$

$$= \sqrt{\frac{6784 - 36.3957X182 - 0.00038X2028}{5-2}}$$

= 7.285

Standard Error of Regression Coefficient (Sb) = $\dfrac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{7.285}{\sqrt{1358.5}}$$

= 0.1976

t-value, $|t| = \dfrac{b}{Sb}$

= 0.0019

2) NABIL Bank Ltd. (NABIL)

Year	**X (DPR)**	**Y(Net profit)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2003/04	70	31.92	2240.5	4926.6	1019	11.09
2004/05	66.36	34.33	2278.1	4403.65	1178	51.27
2005/06	65.36	35.32	2323.3	4327.01	1247	59.91
2006/07	72.95	32.16	2346.1	5321.7	1034	0.32

2007/08	92.33	29.68	2740.3	8524.8	881	353.82
N=5	$\sum$ X=367.6	$\sum Y$ =163.4	$\sum$ XY=11928.4	$\sum$ X2=27504	$\sum$ Y2=5360	$\sum(X-\overline{X})2$ =476.40

Mean,

$\overline{X}$ = 73.52 $\overline{Y}$ = 32.68

ii) Coefficient of correlation (r) = $\frac{n\sum XY-\sum X.\sum Y}{\sqrt{n\sum X2-(\sum X)2}.\sqrt{n\sum Y2-(\sum Y)2}}$

$$= \frac{5x11928.-367.6x163.4}{\sqrt{5x27504-(367.6)2}\sqrt{5x5360-(163.4)2}}$$

= -.8652

Coefficient of Determination (r2) = 0.7486

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.1124

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.0758

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY-\sum X.\sum Y}{n\sum X2-(\sum X)2}$$

$$= \frac{5x11928.4-367.6x163.4}{5x27504-(163.4)2}$$

=-0.1774

a = $\overline{Y}-b\overline{X}$

= 32.68-(-0.1774) x 73.52

= 45.72

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2-a\sum Y-b\sum XY}}{n-2}$

$$= \sqrt{\frac{5360 - 45.72X163.4 - (-0.1774)X11928.24}{5 - 2}}$$

= 1.3443

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$= \frac{7.285}{\sqrt{476.4}}$

= 0.062

t-value, $|t| = \frac{b}{Sb}$

= 2.86

3) Bank of Kathmandu Ltd. (BOK)

Year	**X (DPR)**	**Y(Net profit)**	**XY**	**X2**	**Y2**	**(X- $\overline{X}$)2**
2004/05	49.83	27.13	1352	2483.03	736	208./
2005/06	41.22	35.11	1447	1699.09	1233	34.11
2006/07	45.98	38.75	1782	2114.16	1502	112.36
2007/08	3.52	41.89	147.4	12.39	1755	1015.06
N=5	$\sum$ X=176.91	$\sum Y = 173$	$\sum$ XY=5820.2	$\sum$ X2=7630.72	$\sum$ Y2=6128	$\sum (X - \overline{X})2$ =1371.29

Mean,

$\overline{X}$ = 35.38, $\overline{Y}$ = 34.6

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x5820.2 - 176.91x173}{\sqrt{5x7630.72 - (176.91)2}\sqrt{5x6128 - (173)2}}$$

= -0.6814

Coefficient of Determination (r_2) = 0.4643

Standard Error of correlation coefficient, S.E. (r) = $\frac{1 - r2}{\sqrt{n}}$

= 0.2396

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1 - r2}{\sqrt{n}}$

= 0.1616

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$$\sum Y = n.a + b\sum X \quad \text{and} \quad \sum XY = a\sum X + b\sum X2$$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x5820.2 - 176.91x173}{5x7630.72 - (176.91)2}$$

=- -0.2194

$a = \overline{Y} - b\overline{X}$

= 34.6-(-0.2194) x 35.38

= 42.3624 Standard Error of Estimate (S.E.E) =

$$\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$$

$$= \sqrt{\frac{6128 - 42.362X173 - (-0.2194)X5820.2}{5-2}}$$

= 5.042

Standard Error of Regression Coefficient (S_b) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{7.285}{\sqrt{1371.29}}$$

= 0.1362

t-value, $|t| = \frac{b}{Sb}$

= 1.6114

5) **Pooled Bank Average**

Year	X (DPR)	Y(Net profit)	XY	X2	Y2	$(X-\overline{X})2$
2003/04	35.52	30.4	1080.2	1261.67	925	20.16
2004/05	53.38	33.45	1785.6	2849.42	1119	178.76
2005/06	36.76	33.7	1239	1351.30	1136	10.56
2006/07	41.1	36.5	150.2	1689.21	1332	1.19
2007/08	33.31	38.7	1289	1109.56	1498	44.89
N=5	$\sum$ X=200.07	$\sum Y = 173$	$\sum$ XY=6894	$\sum$ X2=8261.16	$\sum$ Y2=6010	$\sum (X - \overline{X})2$ =255.56

Mean,

$\overline{X}$ = 40.01, $\overline{Y}$ = 34.6

ii) Coefficient of correlation (r) = $\frac{n\sum XY - \sum X.\sum Y}{\sqrt{n\sum X2 - (\sum X)2}.\sqrt{n\sum Y2 - (\sum Y)2}}$

$$= \frac{5x6894 - 200.07x173}{\sqrt{5x8261.16 - (200.07)2}\sqrt{5x6010 - (173)2}}$$

= -0.3614

Coefficient of Determination (r2) = 0.1306

Standard Error of correlation coefficient, S.E. (r) = $\frac{1-r2}{\sqrt{n}}$

= 0.39

Probable error of correlation coefficient, P.E. (r) = 0.6745 x $\frac{1-r2}{\sqrt{n}}$

= 0.2622

Regression equation of Y on X, Y= a+ b X

Where,

a = regression constant

b = Regression coefficient (slope of the regression line)

According to the principle of least square, two normal equations for estimating numerical constant a and b are given by,

$\sum Y = n.a + b\sum X$ and $\sum XY = a\sum X + b\sum X2$

Solving two normal equations, we get

$$b = \frac{n\sum XY - \sum X.\sum Y}{n\sum X2 - (\sum X)2}$$

$$= \frac{5x6894 - 200.07x173}{5x8261.16 - (200.07)2}$$

=- -0.1112

a = $\overline{Y} - b\overline{X}$

= 34.6-(-0.1112) x 40.01

= 39.049

Standard Error of Estimate (S.E.E) = $\frac{\sqrt{\sum Y2 - a\sum Y - b\sum XY}}{n-2}$

$$= \sqrt{\frac{6010 - 39.049X173 - (-0.1112)X6894}{5-2}}$$

= 2.6543

Standard Error of Regression Coefficient (Sb) = $\frac{S.E.E.}{\sqrt{\sum (X - \overline{X})2}}$

$$= \frac{2.6543}{\sqrt{255.6}}$$

= 0.166

t-value, $|t| = \frac{b}{Sb}$

= 0.6699

Appendix-F

Multiple Regression Analysis of MPS on EPS and DPS (of pooled Bank Average)

Year	MPS(X_1)	EPS(X_2)	DPS(X_3)	X_1^2	X_2^2	X_3^2	X_1X_2	X_2X_3	X_1X_3
2003/04	504.3	44.59	25	25434.875	1988.3	625	22488	1115	12068
2004/05	767	52.78	31.67	588289	2785.7	1003	40482	1671	24291
2005/06	1195.33	63	34.51	1428814	3969	1191	75306	2174	41251
2006/07	2458.33	68.2	40.35	603386.4	4651.2	1628	16765	2752	99194
2007/08	2970	64.67	34.39	8820900	5182.2	1183	192070	2224	102138
N=5	$\sum X_1$= **3317.87**	$\sum X_2$	$\sum X_3$	$\sum X_1^2$	$\sum X_2^2$	$\sum X_3^2$	$\sum X_1X_2$	$\sum X_2X_3$	$\sum X_1X_3$

Mean; $\overline{X1}$=1579, $\overline{X2}$=59 and $\overline{X3}$=33

Dependent variable: MPS ($\overline{X1}$)

Independent variables: EPS($\overline{X2}$) and DPS($\overline{X3}$)

The general formula of multiple regression equation is given case is

$X_1=a_1+b_1X_2+b_2X_3$

Where, a_1 = regression constant

b_2 And b_1= Regression coefficient

Required normal equations to find the value of a_1 b_2 And b_1 can be written as under as:

$\sum X_1=n.a_1+b_1\sum X_2+b_2\sum X_3$ …………………………. (i)

$\sum X_1X_2 = a_1\sum X_2+\sum X_2^2+ b_2\sum X_2X_3$ ……………………….(ii)

$\sum X_1X_2 = a_1\sum X_3+ b_1\sum X_2X_3+ b_2\sum X_2^2$ …………………….(iii)

Subtitling the corresponding values and solving, we get

a_1 = -3317.87 b_1 = 120.37 And b_2 = 64.9642

Hence the required multiple regression equation as follows

$\mathbf{X_1 = -3317.87+120.37X_2+64.9642X_3}$

Standard Error of Estimated is given by X_1 on X_2 and X_3 is given by

$$S_{1.23} = \sqrt{\frac{\sum X1^2 - a1\sum X1 - b1\sum X1X2 - b2\sum X1X3}{(n-3)}}$$

$$= \sqrt{\frac{17135737.95 - (-3317.87) - 120.37x498004 - (-64.9642)x279842}{5-3}}$$

= 878.04

Appendix-G

Coefficient of Multiple Determination among MPS, EPS and DPS (Pooled Average)

Year	MPS(X_1)	EPS(X_2)	DPS(X_3)	$(X_1 - \overline{x1})^2$	$\vec{x1}$	$(\vec{x} - \overline{x1})^2$	$(X1-\vec{x1})2$
2003/04	504.33	44.59	25	1154915	425.32	1330977.5	6242.58
2004/05	767	52.78	31.67	659344	97.8	361441.4	4436.64
2005/06	1195.33	63	34.51	147203`	2023.5	197580.3	685865.5
2006/07	2458.33	68.2	40.35	773221	2270.1	477619.2	35430.5
2007/08	2970	64.67	34.39	1934881	2232.3	426801	544201.3
N=5	$\sum X_1=$	$\sum X_2$	$\sum X_3$	$\sum (X_1 - \overline{x1})^2$	$\sum \vec{x1}$	$\sum (\vec{x} - \overline{x1})^2$	$\sum (X1-\vec{x1})2$

$\overline{X1}$=1579

Total variation = Total sum of Square = TSS = $\sum (X_1 - \overline{x1})^2$ = 4669564

Explained Variation = Regression sum of Square = SSR = $\sum (\vec{x} - \overline{x1})^2$ = 2794419

Unexplained variation = $\sum (X1-\vec{x1})2$ = 1316177

The coefficient of Multiple Determination is given by

$$R_{1.23}^2 = \frac{\text{explained variation}}{\text{Total variation}}$$

$$= \frac{2794419}{4669564}$$

== 0.5984

Appendix-H

Test of Regression coefficients of Multiple Regression model (Pooled Bank Average)

i) Grand Total (T) = $\sum$ **X_1+** $\sum$ **X_2+** $\sum$ **X_3 =** 7895+293+166 = 8354

ii) Correction Factor (C.F) = $\frac{T2}{N}$

= 4652799

iii) Total sum of square (T.S.S) = $\sum X_1^2 + \sum X_2^2 + \sum X_3^2 - C.F$

= 17135738+17576+5629.72-652799

= 12506145

iv) Sum of Square between Samples (S.S.C) = $\frac{(\sum x1)2}{n1} + \frac{(\sum x2)2}{n2} \frac{(\sum x3)2}{n3} - C.F$

$$= \frac{(7895)2}{5} + \frac{(293)2}{5} + \frac{(166)2}{5} - 4652799$$

=7836109.5

v) Sum of Square within Samples (S.S.W) = T.S.S – S.S.C

= 12506145-7836109.53

= 4670035.5

One way ANOVA Table

S.N	Source of Variation (S.V)	Sum of Square	D.F	Mean Sum of square (M.S.S)	F_1=ratio
1	Between Samples	7836109.5	2	3918054.75	10.068
2	Within Samples	4670035.5	12	389169.625	
3	Total	12506145	14		

Appendix-I

Multiple Regression Analysis of MPS on DPR and DPS (of pooled Bank Average)

Year	MPS(X_1)	DPR(X_2)	DPS(X_3)	X_1^2	X_2^2	X_3^2	X_1X_2	X_2X_3	X_1X_3
2003/04	504.3	35.52	25	25434.875	1261.7	625	1791	888	12608
2004/05	767	53.38	31.67	588289	2849.4	1003	4094	1691	24291
2005/06	1195.33	3676	34.51	142814	1351.3	1191	43940	1269	41251
2006/07	2458.33	41.10	40.35	6043386.4	1689.2	1628	101037	1658	99194
2007/08	2970	33.31	34.39	8820900	1109.6	1183	98931	1146	102138
N=5	$\sum X_{1=}$ **3317.87**	$\sum X_2$	$\sum X_3$	$\sum X_1^2$	$\sum X_2^2$	$\sum X_3^2$	$\sum X_1X_2$	$\sum X_2X_3$	$\sum X_1X_3$

Mean; $\overline{X1}$= 1579, $\overline{X2}$=40.01 and $\overline{X3}$=33.2

Dependent variable: MPS ($\overline{X1}$)

Independent variables: DPR($\overline{X2}$) and DPS($\overline{X3}$)

The general formula of multiple regression equation is given case is

$X_1=a_1+b_1X_2+b_2X_3$

Where, a_1 = regression constant

b_2 And b_1= Regression coefficient

Required normal equations to find the value of a_1 b_2 And b_1 can be written as under as:

$\sum X_1=n.a_1+b_1\sum X_2+b_2\sum X_3$ …………………………. (i)

$\sum X_1X_2 = a_1\sum X_2+\sum X_2^2+ b_2\sum X_2X_3$ ……………………….(ii)

$\sum X_1X_2 = a_1\sum X_3+ b_1\sum X_2X_3+ b_2\sum X_2^2$ …………………….(iii)

Subtitling the corresponding values and solving, we get

a_1 = -1194.87 $b_{1=}$ -56.3238 And $b_{2=}$ 151.4102

Hence the required multiple regression equation as follows

$$X_{1=-}1194.87-56.3238X_{2+}151.4102X_3$$

Standard Error of Estimated is given by X_1 on X_2 and X_3 is given by

$$S_{1.23} = \sqrt{\frac{\sum X12 - a1\sum X1 - b1\sum X1X2 - b2\sum X1X3}{(n-3)}}$$

$$= \sqrt{\frac{17135737.95-(-1194.87)x7895-(-56.3238)x302764.7-151.4102x279842}{5-3}}$$

= 807.9697

Year	MPS(X_1)	DPR(X_2)	DPS(X_3)	$(X_1 - \overline{x1})^2$	$\vec{x1}$	$(\vec{x}_. - \overline{x1})^2$	$(X1- \vec{x1})2$
2003/04	504.33	35.52	25	1154915	589.76	978596	7298.3
2004/05	767	53.38	31.67	659344	593.73	970757	30022.5
2005/06	1195.33	36.76	34.51	147203`	1959.8	145031.5	584460
2006/07	2458.33	41.1	40.35	773221	2599.6	1041665	19963
2007/08	2970	33.31	34.39	1934881	2135.98	310227	695589.4
N=5	$\sum X_{1=}$	$\sum X_2$	$\sum X_3$	$\sum (X_1 - \overline{x1})^2$	$\sum \vec{x1}$	$\sum (\vec{x}_. - \overline{x1})^2$	$\sum (X1- \vec{x1})2$

$\overline{X1}$=1579

Total variation = Total sum of Square = TSS = $\sum (X_1 - \overline{x1})^2$ = 4669564

Explained Variation = Regression sum of Square = SSR = $\sum (\vec{x}_. - \overline{x1})^2$ = 3446276

Unexplained variation = $\sum (X1- \vec{x1})2$ = 1337333

The coefficient of Multiple Determination is given by

$$R_{1.23}^2 = \frac{\text{explained variation}}{\text{Total variation}}$$

$$= \frac{3446276}{4669564}$$

== 0.7380

Appendix-H

Test of Regression coefficients of Multiple Regression model (Pooled Bank Average)

iv) Grand Total (T) = $\sum$ $\mathbf{X_1}$+$\sum$ $\mathbf{X_2}$+$\sum$ $\mathbf{X_3}$ **=** 7895+200+166 = 8261

v) Correction Factor (C.F) = $\frac{T2}{N}$

= 454968

vi) Total sum of square (T.S.S) = $\sum X_1^2 + \sum X_2^2 + \sum X_3^2 - C.F$

= 17135738+8261.2+5629.72-4549608

= 12600021

iv) Sum of Square between Samples (S.S.C) = $\frac{(\sum x1)2}{n1} + \frac{(\sum x2)2}{n2} \frac{(\sum x3)2}{n3} - C.F$

$= \frac{(7895)2}{5} + \frac{(200)2}{5} + \frac{(166)2}{5} - 4549608$

=7930108.5

v) Sum of Square within Samples (S.S.W) = T.S.S – S.S.C

= 12600021-7930108.5

= 4669912.5

One way ANOVA Table

S.N	Source of Variation (S.V)	Sum of Square	D.F	Mean Sum of square (M.S.S)	F_1=ratio
1	Between Samples	7930108.5	2	3965054	10.1883
2	Within Samples	4669912.5	12	389159	
3	Total	12600021	14		