

APPENDIX – I

Calculation of Growth Rate of Total Loan of NABIL, EBL and HBL

Growth rate is calculated;

$$D_n = D_0 (1+g)^{n-1}$$

Where,

D_n = Total loan of n^{th} year.

D_0 = Total deposit of initial year

g = growth rate

n = number of year

Calculation of average growth rate of 'Total Loan & Advance' of NABIL bank

For 2004/05 to 2008/09:

$D_{2008/09}$ = Rs. 27589.93 million

$D_{2004/05}$ = Rs. 10586.17 million

n = 5 year

$$D_{2008/09} = D_{2004/05} (1+g)^{5-1}$$

$$\text{Or, } 27589.93 = 10586.17 (1+g)^4$$

$$\text{Or, } 2.306 = (1+g)^4$$

$$\text{Or, } g = (2.306)^{\frac{1}{4}} - 1$$

$$\text{Or, } g = 27\%$$

Calculation of Growth rate in Personal-Mortgage lending each year from 2004/05 to 2008/09;

It is assumed that PML cover 20% of 'Total loan and advances' because one CEO of NIC bank has said in his interview in 2008 that 20% has been invested for individual borrowers out of total loan. Likewise as per inquiry with the related employee of PLU of NABIL bank they have said the contribution of PLU is 20 – 25 percentages in total loan and advances.

Calculation of rate of PML of NABIL

(Rs. in million)

Fiscal Year	Initial PML %	Avg. Growth rate (%)	New PML %
2004/05	9.75	-	9.75
2005/06	9.75	27.00	12.38
2006/07	12.38	27.00	15.73
2007/08	15.73	27.00	19.97
2008/09	19.97	27.00	25.36

Calculation of PML amount of NABIL Bank

(Rs. in million)

Fiscal Year	Total Loan	% of PML	PML Rs.
2004/05	10586.17	9.75	1032.15
2005/06	12922.54	12.38	1599.81
2006/07	15545.78	15.73	2445.35
2007/08	21365.05	19.97	4266.60
2008/09	27589.93	25.36	6996.81

Calculation of average growth rate of 'Total Loan & Advance' of EBL

For 2004/05 to 2008/09:

$D_{2008/09} = \text{Rs. } 23884.67 \text{ million}$

$D_{2004/05} = \text{Rs. } 7618.67 \text{ million}$

$n = 5 \text{ year}$

$$D_{2008/09} = D_{2004/05} (1+g)^{5-1}$$

$$\text{Or, } 23884.67 = 7618.67 (1+g)^4$$

$$\text{Or, } 3.135 = (1+g)^4$$

$$\text{Or, } g = (3.135)^{\frac{1}{4}} - 1$$

$$\text{Or, } g = 33\%$$

Calculation of rate of PML of EBL

(Rs. in million)

Fiscal Year	Initial PML %	Avg. Growth rate (%)	New PML %
2004/05	8.50	-	8.50
2005/06	8.50	0.33	11.31
2006/07	11.31	0.33	15.04
2007/08	15.04	0.33	20.00
2008/09	20.00	0.33	26.60

Calculation of PML amount of EBL

(Rs. in million)

Fiscal Year	Total Loan	% of PML	PML Rs.
2004/05	7618.67	8.50	647.59
2005/06	9801.31	11.31	1108.53
2006/07	13664.08	15.04	2055.08
2007/08	18339.09	20.00	3667.82
2008/09	23884.67	26.60	6353.32

Calculation of average growth rate of 'Total Loan & Advance' of HBL

For 2004/05 to 2008/09:

$$D_{2008/09} = \text{Rs. } 24793.16 \text{ million}$$

$$D_{2004/05} = \text{Rs. } 12424.52 \text{ million}$$

$$n = 5 \text{ year}$$

$$D_{2008/09} = D_{2004/05} (1+g)^{5-1}$$

$$\text{Or, } 24793.16 = 12424.52(1+g)^4$$

$$\text{Or, } 1.995 = (1+g)^4$$

$$\text{Or, } g = (1.995)^{\frac{1}{4}} - 1$$

$$\text{Or, } g = 18.8\%$$

Calculation of rate of PML of HBL

(Rs. in million)

Fiscal Year	Initial PML %	Avg. Growth rate (%)	New PML %
2004/05	9.00	-	9.00
2005/06	9.00	18.80	10.69
2006/07	10.69	18.80	12.70
2007/08	12.70	18.80	15.09
2008/09	15.09	18.80	17.93

Calculation of PML amount of HBL

(Rs. in million)

Fiscal Year	Total Loan	% of PML	PML Rs.
2004/05	12424.52	9.00	1118.21
2005/06	14642.56	10.69	1565.29
2006/07	16998.00	12.70	2158.75
2007/08	19497.52	15.09	2942.18
2008/09	24793.16	17.93	4445.41

APPENDIX - II

**Calculation of average interest rate of PML in last five years
Of NABIL**

(Rs. in million)

Fiscal Year	6 months interest rate	Interest rate of Auto Loan	Interest rate of Home Loan	Interest rate of Mortgage Loan	Interest rate of OD Loan	sum of interest rate	average interest rate	Yearly Interest rate
2004/05	1st half	8.50%	7.50%	8.00%	0.00%	24.00%	8.00%	8.17%
	2nd half	9.00%	7.50%	8.50%	0.00%	25.00%	8.33%	
2005/06	1st half	9.00%	8.00%	10.00%	0.00%	27.00%	9.00%	9.17%
	2nd half	9.50%	8.50%	10.00%	0.00%	28.00%	9.33%	
2006/07	1st half	10.00%	8.50%	10.00%	0.00%	28.50%	9.50%	9.67%
	2nd half	10.00%	9.50%	10.00%	0.00%	29.50%	9.83%	
2007/08	1st half	10.50%	8.50%	10.50%	0.00%	29.50%	9.83%	9.92%
	2nd half	11.00%	8.50%	10.50%	0.00%	30.00%	10.00%	
2008/09	1st half	11.50%	10.50%	11.50%	0.00%	33.50%	11.17%	11.42%
	2nd half	12.00%	11.00%	12.00%	0.00%	35.00%	11.67%	

Where,

Sum of interest = interest rate of Auto Loan + Home Loan + Mortgage Loan + Overdraft (OD) loan.

$$\text{Average interest rate} = \frac{\text{Sum of interest rate}}{\text{No. of PLU products}}$$

No. of PLU products = 4

$$\text{Yearly Interest rate} = \frac{\text{Avg. interest rate of 1st half} + \text{Avg. interest rate of 2nd half}}{2}$$

**Calculation of average interest rate of PML in last five years,
Of EBL**

(Rs. in million)

Fiscal Year	6 months interest rate	Interest rate of Auto Loan	Interest rate of Home Loan	Interest rate of Mortgage Loan	Interest rate of OD Loan	sum of interest rate	average interest rate	Yearly Interest rate
2004/05	1st half	7.50%	7.75%	8.00%	8.75%	32.00%	8.00%	8.13%
	2nd half	7.50%	8.00%	8.50%	9.00%	33.00%	8.25%	
2005/06	1st half	8.00%	8.25%	9.50%	9.25%	35.00%	8.75%	8.88%
	2nd half	8.50%	8.50%	9.50%	9.50%	36.00%	9.00%	
2006/07	1st half	9.00%	8.75%	8.50%	9.50%	35.75%	8.94%	9.09%
	2nd half	9.50%	9.00%	8.75%	9.75%	37.00%	9.25%	
2007/08	1st half	10.00%	9.00%	9.00%	10.00%	38.00%	9.50%	9.53%
	2nd half	10.00%	9.25%	9.00%	10.00%	38.25%	9.56%	
2008/09	1st half	9.50%	9.25%	9.25%	10.25%	38.25%	9.56%	9.72%
	2nd half	9.75%	9.75%	9.75%	10.25%	39.50%	9.88%	

**Calculation of average interest rate of PML in last five years,
Of HBL**

(Rs. in million)

Fiscal Year	6 months interest rate	Interest rate of Auto Loan	Interest rate of Home Loan	Interest rate of Mortgage Loan	Interest rate of OD Loan	sum of interest rate	average interest rate	Yearly Interest rate
2004/05	1st half	8.50%	7.50%	8.00%	9.75%	33.75%	8.44%	8.59%
	2nd half	9.00%	7.50%	8.50%	10.00%	35.00%	8.75%	
2005/06	1st half	9.00%	8.00%	10.00%	10.25%	37.25%	9.31%	9.53%
	2nd half	10.00%	8.50%	10.00%	10.50%	39.00%	9.75%	
2006/07	1st half	10.25%	8.50%	10.00%	10.50%	39.25%	9.81%	9.75%
	2nd half	10.25%	9.50%	10.00%	9.00%	38.75%	9.69%	
2007/08	1st half	8.00%	8.50%	10.50%	9.00%	36.00%	9.00%	9.06%
	2nd half	8.50%	8.50%	10.50%	9.00%	36.50%	9.13%	
2008/09	1st half	9.75%	10.50%	11.50%	9.50%	41.25%	10.31%	10.59%
	2nd half	10.75%	11.00%	12.00%	9.75%	43.50%	10.88%	

APPENDIX-III

**Calculation of PML returns in last five years,
Of NABIL**

(Rs. in million)

Fiscal Year	Yearly interest rate	PML Amout	Interest income	rate of service charge	Service Chage in Rs.	Total income
2004/05	8.17%	1032.15	84.33	1.00%	10.32	94.65
2005/06	9.17%	1599.81	146.70	1.00%	16.00	162.70
2006/07	9.67%	2445.35	236.47	1.00%	24.45	260.92
2007/08	9.92%	4266.60	423.25	1.00%	42.67	465.91
2008/09	11.42%	6996.81	799.04	1.00%	69.97	869.00

**Calculation of PML returns in last five years,
Of EBL**

(Rs. in million)

Fiscal Year	Yearly interest rate	PML Amout	Interest income	rate of service charge	Service Chage in Rs.	Total income
2004/05	8.13%	647.59	52.65	1.00%	6.48	59.12
2005/06	8.88%	1108.53	98.44	1.00%	11.09	109.52
2006/07	9.09%	2055.08	186.81	1.00%	20.55	207.36
2007/08	9.53%	3667.82	349.54	1.00%	36.68	386.22
2008/09	9.73%	6353.32	618.18	1.00%	63.53	681.71

**Calculation of PML returns in last five years,
Of HBL**

(Rs. in million)

Fiscal Year	Yearly interest rate	PML Amout	Interest income	rate of service charge	Service Chage in Rs.	Total income
2004/05	8.59%	1118.21	96.05	1.00%	11.18	107.24
2005/06	9.53%	1565.29	149.17	1.00%	15.65	164.83
2006/07	9.75%	2158.75	210.48	1.00%	21.59	232.07
2007/08	9.06%	2942.18	266.56	1.00%	29.42	295.98
2008/09	10.59%	4445.41	470.77	1.00%	44.45	515.22

APPENDIX-IV

Calculation of Correlation between Deposit and Loan & Advance of NABIL bank

(Rs. in million)

Fiscal Year	Loan & Advances (x)	Deposit (y)	dx = (x - \bar{x})	dx ²	dy = (y - \bar{y})	dy ²	dx dy
2004/05	10586.17	14586.61	-7015.73	49220467.43	-10721.31	114946531.00	75217830.24
2005/06	12922.54	19347.40	-4679.36	21896381.93	-5960.52	35527810.59	27891405.66
2006/07	15545.78	23342.29	-2056.12	4227637.68	-1965.64	3863720.95	4041585.37
2007/08	21365.05	31915.05	3763.15	14161320.50	6607.13	43654127.19	24863629.79
2008/09	27589.93	37348.26	9988.03	99760803.21	12040.34	144969666.91	120259263.31
	$\Sigma x =$ 88009.48	$\Sigma y =$ 126539.59	$\Sigma dx = -0.02$	$\Sigma dx^2 =$ 189266610.76	$\Sigma dy = -0.01$	$\Sigma dy^2 =$ 342961856.65	$\Sigma dx dy =$ 252273714.37
	$\bar{x} =$ 17601.90	$\bar{y} =$ 25307.918					

$$r_{xy} = \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}}$$

$$= \frac{5 \times 25227371437 - (0.02 \times 0.01)}{\sqrt{5 \times 18926661076 - (0.02)^2} \sqrt{5 \times 34296185665 - (0.01)^2}}$$

$$= \frac{1261368572}{\sqrt{9463330535} \sqrt{1714809283}}$$

$$= \frac{1261368572}{3076253 \times 4141026}$$

$$= \frac{1261368572}{1273884235}$$

$$= 0.99$$

Calculation of Probable Error (P.E.):

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

$$= 0.6745 \frac{1-0.99^2}{\sqrt{5}}$$

$$= 0.6745 \times 0.0089$$

$$= 0.006$$

$$6PEr = 6 \times 0.006$$

$$= 0.036$$

$r > 6PE$, therefore co-relation is significant

Calculation of Correlation between Deposit and Loan and Advance of EBL

(Rs. in million)

Fiscal Year	Loan & Advances (x)	Deposit (y)	$dx = (x - \bar{x})$	dx^2	$dy = (y - \bar{y})$	dy^2	$dx dy$
2004/05	7618.67	10097.69	-7042.89	49602285.47	-9779.44	95637446.71	68875510.40
2005/06	9801.31	13802.44	-4860.25	23622059.22	-6074.69	36901810.00	29524510.86
2006/07	13664.08	18186.25	-997.48	994964.36	-1690.88	2859065.03	1686614.30
2007/08	18339.09	23976.30	3677.53	13524190.13	4099.17	16803178.29	15074792.80
2008/09	23884.67	33322.95	9223.11	85065813.41	13445.82	180789967.91	124012280.35
	$\Sigma x =$ 73307.82	$\Sigma y =$ 99385.63	$\Sigma dx = 0.02$	$\Sigma dx^2 =$ 172809312.58	$\Sigma dy = -0.02$	$\Sigma dy^2 =$ 332991467.94	$\Sigma dx dy =$ 239173708.70
	$\bar{x} =$ 14661.56	$\bar{y} =$ 19877.13					

$$\begin{aligned}
 r_{xy} &= \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}} \\
 &= \frac{5 \times 23917370870 - (-0.02 \times 0.02)}{\sqrt{5 \times 17280931258 - (-0.02)^2} \sqrt{5 \times 33299146794 - (0.02)^2}} \\
 &= \frac{1195868544}{\sqrt{8640465625} \sqrt{1664957336}} \\
 &= \frac{1195868544}{29394.67 \times 40803.89} \\
 &= \frac{1195868544}{1199416838} \\
 &= 0.997
 \end{aligned}$$

Calculation of Probable Error (P.E.):

$$\begin{aligned}
 P.E. &= 0.6745 \frac{1-r^2}{\sqrt{N}} \\
 &= 0.6745 \frac{1-0.997^2}{\sqrt{5}} \\
 &= 0.6745 \times 0.0027 \\
 &= 0.0018 \\
 6PEr &= 6 \times 0.0018 \\
 &= 0.01
 \end{aligned}$$

$r > 6PE$, therefore co-relation is significant

Calculation of Correlation between Deposit and Loan and Advance of HBL

(Rs. in million)

Fiscal Year	Loan & Advances (x)	Deposit (y)	$dx = \frac{dx}{(x - \bar{x})}$	dx^2	$dy = \frac{dy}{(y - \bar{y})}$	dy^2	$dx dy$
2004/05	12424.52	24814.01	-5246.63	27527126.36	-4761.47	22671587.04	24981666.10
2005/06	14642.56	26490.85	-3028.59	9172363.45	-3084.63	9514936.07	9342079.63
2006/07	16998.00	30048.42	-673.15	453134.96	472.94	223669.41	-318358.96
2007/08	19497.52	31842.79	1826.37	3335627.38	2267.31	5140690.10	4140945.14
2008/09	24793.16	34681.35	7122.01	50722955.22	5105.87	26069857.40	36363996.06
	$\Sigma x =$ 88355.75	$\Sigma y =$ 147877.41	$\Sigma dx = 0.00$	$\Sigma dx^2 =$ 91211207.36	$\Sigma dy = 0.01$	$\Sigma dy^2 =$ 63620740.01	$\Sigma dx dy =$ 74510327.96
	$\bar{x} =$ 17671.15	$\bar{y} =$ 29575.48					

$$\begin{aligned}
 r_{xy} &= \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}} \\
 &= \frac{5 \times 7451032796 - (0.00 \times 0.01)}{\sqrt{5 \times 9121120736 - (0.00)^2} \sqrt{5 \times 6362074001 - (0.01)^2}} \\
 &= \frac{3725516398}{\sqrt{4560560368} \sqrt{318103700}} \\
 &= \frac{3725516398}{2135547 \times 1783546} \\
 &= \frac{3725516398}{3808846708} \\
 &= 0.978
 \end{aligned}$$

Calculation of Probable Error (P.E.):

$$\begin{aligned}
 \text{P.E.} &= 0.6745 \frac{1-r^2}{\sqrt{N}} \\
 &= 0.6745 \frac{1-0.978^2}{\sqrt{5}} \\
 &= 0.6745 \times 0.0195 \\
 &= 0.013 \\
 6\text{PEr} &= 6 \times 0.013 \\
 &= 0.0787
 \end{aligned}$$

$r > 6\text{PE}$, therefore co-relation is significant

APPENDIX – V

Calculation of Correlation between PML and Deposit of NABIL bank

(Rs. in million)

Fiscal Year	PML (x)	Deposit (y)	$dx = (x - \bar{x})$	dx^2	$dy = (y - \bar{y})$	dy^2	$dx dy$
2004/05	2117.23	14586.61	-4160.97	17313671.34	-10721.31	114946531.00	44611057.59
2005/06	3282.33	19347.40	-2995.87	8975237.06	-5960.52	35527810.59	17856946.05
2006/07	5015.07	23342.29	-1263.13	1595497.40	-1965.64	3863720.95	2482852.54
2007/08	7945.66	31915.05	1667.46	2780422.85	6607.13	43654127.19	11017119.99
2008/09	13030.73	37348.26	6752.53	45596661.40	12040.34	144969666.91	81302723.30
	$\Sigma x =$ 31391.02	$\Sigma y =$ 126539.59	$\Sigma dx = 0.02$	$\Sigma dx^2 =$ 76261490.05	$\Sigma dy = -0.01$	$\Sigma dy^2 =$ 342961856.65	$\Sigma dx dy =$ 157270699.46
	$\bar{x} =$ 6278.20	$\bar{y} =$ 25307.918					

$$r_{xy} = \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}}$$

$$= \frac{5 \times 157270699.46 - (0.02 \times (-0.01))}{\sqrt{5 \times 76261490.05 - (-0.02)^2} \sqrt{5 \times 342961856.65 - (-0.01)^2}}$$

$$= \frac{786353497.30}{\sqrt{381307450.3} \sqrt{171480928.3}}$$

$$= \frac{786353497.30}{19527.1 \times 41410.26}$$

$$= \frac{786353497.30}{808622092.8}$$

$$= 0.97$$

Calculation of Probable Error (P.E.):

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

$$= 0.6745 \frac{1-0.97^2}{\sqrt{5}}$$

$$= 0.6745 \times 0.0264$$

$$= 0.018$$

$$6PEr = 6 \times 0.006$$

$$= 0.107$$

$r > 6PE$, therefore co-relation is significant

Calculation of Correlation between PML and Deposit of EBL

(Rs. in million)

Fiscal Year	PML (x)	Deposit (y)	$dx = (x - \bar{x})$	dx^2	$dy = (y - \bar{y})$	dy^2	$dx dy$
2004/05	1523.73	10097.69	-4171.54	17401745.97	-9779.44	95637446.71	40795325.14
2005/06	2607.15	13802.44	-3088.12	9536485.13	-6074.69	36901810.00	18759359.33
2006/07	4834.35	18186.25	-860.92	741183.25	-1690.88	2859065.03	1455709.83
2007/08	7141.24	23976.30	1445.97	2090829.24	4099.17	16803178.29	5927273.95
2008/09	12369.87	33322.95	6674.60	44550285.16	13445.82	180789967.91	89745443.47
	$\Sigma x =$ 28476.34	$\Sigma y =$ 99385.63	$\Sigma dx = -0.01$	$\Sigma dx^2 =$ 74320528.75	$\Sigma dy = -0.02$	$\Sigma dy^2 =$ 332991467.94	$\Sigma dx dy =$ 156683111.72
	$\bar{x} =$ 5695.27	$\bar{y} =$ 19877.13					

$$\begin{aligned}
 r_{xy} &= \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}} \\
 &= \frac{5 \times 156683111.72 - (-0.01 \times (-0.02))}{\sqrt{5 \times 74320528.75 - (-0.02)^2} \sqrt{5 \times 332991467.94 - (-0.02)^2}} \\
 &= \frac{7834155586}{\sqrt{371602643.8} \sqrt{1664957340}} \\
 &= \frac{7834155586}{1927610 \times 40803.89} \\
 &= \frac{7834155586}{7865764974} \\
 &= 0.996
 \end{aligned}$$

Calculation of Probable Error (P.E.):

$$\begin{aligned}
 \text{P.E.} &= 0.6745 \frac{1-r^2}{\sqrt{N}} \\
 &= 0.6745 \frac{1-0.996^2}{\sqrt{5}} \\
 &= 0.6745 \times 0.0036 \\
 &= 0.0024 \\
 6\text{PEr} &= 6 \times 0.0024 \\
 &= 0.014
 \end{aligned}$$

$r > 6\text{PE}$, therefore co-relation is significant

Calculation of Correlation between PML and Deposit of HBL

(Rs. in million)

Fiscal Year	PML (x)	Deposit (y)	$dx = (x - \bar{x})$	dx^2	$dy = (y - \bar{y})$	dy^2	$dx dy$
2004/05	2484.91	24814.01	-3072.75	9441792.56	-4761.47	22671587.04	14630803.87
2005/06	3479.07	26490.85	-2078.59	4320536.39	-3084.63	9514936.07	6411678.99
2006/07	4798.53	30048.42	-759.13	576278.36	472.94	223669.41	-359020.66
2007/08	6781.24	31842.79	1223.58	1497148.02	2267.31	5140690.10	2774233.95
2008/09	10244.53	34681.35	4686.87	21966750.40	5105.87	26069857.40	23930525.49
	$\Sigma x =$ 27788.28	$\Sigma y =$ 147877.41	$\Sigma dx = -0.02$	$\Sigma dx^2 =$ 37802505.72	$\Sigma dy = 0.01$	$\Sigma dy^2 =$ 63620740.01	$\Sigma dx dy =$ 47388221.64
	$\bar{x} =$ 5557.66	$\bar{y} =$ 29575.48					

$$\begin{aligned}
 r_{xy} &= \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}} \\
 &= \frac{5 \times 47388221.64 - (-0.02 \times 0.01)}{\sqrt{5 \times 37802505.72 - (-0.02)^2} \sqrt{5 \times 63620740.01 - (0.01)^2}} \\
 &= \frac{23694110820}{\sqrt{1890125286} \sqrt{318103700}} \\
 &= \frac{23694110820}{1374818 \times 17835.46} \\
 &= \frac{23694110820}{24520516330} \\
 &= 0.966
 \end{aligned}$$

Calculation of Probable Error (P.E.):

$$\begin{aligned}
 P.E. &= 0.6745 \frac{1-r^2}{\sqrt{N}} \\
 &= 0.6745 \frac{1-0.966^2}{\sqrt{5}} \\
 &= 0.6745 \times 0.030 \\
 &= 0.030 \\
 6PEr &= 6 \times 0.030 \\
 &= 0.18
 \end{aligned}$$

$r > 6PE$, therefore co-relation is significant

APPENDIX-VI

Calculation of Correlation between Total Assets and Net Profit of NABIL bank

(Rs. in million)

Fiscal Year	Assets (x)	Net Profit (y)	$dx = \frac{dx}{(x - \bar{x})}$	dx^2	$dy = \frac{dy}{(y - \bar{y})}$	dy^2	$dx dy$
2004/05	17186.33	520.11	-12367.64	152958498.99	-201.26	40503.98	2489061.59
2005/06	22329.97	635.26	-7224.00	52186161.55	-86.11	7414.59	622044.11
2006/07	27253.39	673.96	-2300.58	5292654.53	-47.41	2247.74	109071.05
2007/08	37132.76	746.47	7578.79	57438042.71	25.10	629.91	190212.45
2008/09	43867.40	1031.05	14313.43	204874206.80	309.68	95903.62	4432626.57
	$\Sigma x =$ 147769.85	$\Sigma y =$ 3606.86	$\Sigma dx = 0.00$	$\Sigma dx^2 =$ 472749564.57	$\Sigma dy = 0.01$	$\Sigma dy^2 =$ 146699.83	$\Sigma dx dy =$ 7843015.77
	$\bar{x} =$ 29553.97	$\bar{y} =$ 721.37					

$$r_{xy} = \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}}$$

$$= \frac{5 \times 7843015.77 - (0.00 \times (0.01))}{\sqrt{5 \times 472749564.57 - (0.00)^2} \sqrt{5 \times 146699.83 - (0.01)^2}}$$

$$= \frac{3921507885}{\sqrt{2363747823} \sqrt{733499.15}}$$

$$= \frac{3921507885}{4861839 \times 856.45}$$

$$= \frac{3921507885}{4163900859}$$

$$= 0.94$$

Calculation of Probable Error (P.E.):

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

$$= 0.6745 \frac{1-0.94^2}{\sqrt{5}}$$

$$= 0.6745 \times 0.113$$

$$= 0.076$$

$$6PEr = 6 \times 0.076$$

$$= 0.46$$

$r > 6PE$, therefore co-relation is significant

Calculation of Correlation between Assets and Net Profit of EBL

(Rs. in million)

Fiscal Year	Assets (x)	Net Profit (y)	$dx = \frac{dx}{(x - \bar{x})}$	dx^2	$dy = \frac{dy}{(y - \bar{y})}$	dy^2	$dx dy$
2004/05	11732.52	168.21	-10905.59	118931971.38	-190.16	36159.30	2073764.05
2005/06	15959.28	237.29	-6678.83	44606707.56	-121.08	14660.37	808672.17
2006/07	21432.57	296.41	-1205.54	1453316.32	-61.96	3839.17	74696.20
2007/08	27149.34	451.22	4511.23	20351222.13	92.85	8620.75	418858.95
2008/09	36916.85	638.73	14278.74	203882358.87	280.36	78602.85	4003215.54
	$\Sigma x =$ 113190.57	$\Sigma y =$ 1791.86	$\Sigma dx = 0.02$	$\Sigma dx^2 =$ 389225576.27	$\Sigma dy =$ 0.01	$\Sigma dy^2 =$ 141882.44	$\Sigma dx dy =$ 7379206.91
	$\bar{x} =$ 22638.11	$\bar{y} =$ 358.37					

$$r_{xy} = \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}}$$

$$= \frac{5 \times 737920691 - (0.02 \times (0.01))}{\sqrt{5 \times 38922557627 - (0.02)^2} \sqrt{5 \times 14188244 - (0.01)^2}}$$

$$= \frac{3689603455}{\sqrt{1946127881} \sqrt{7094122}}$$

$$= \frac{3689603455}{4411494 \times 842.27}$$

$$= \frac{3689603455}{3715669051}$$

$$= 0.993$$

Calculation of Probable Error (P.E.):

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

$$= 0.6745 \frac{1-0.993^2}{\sqrt{5}}$$

$$= 0.6745 \times 0.0062$$

$$= 0.0042$$

$$6PEr = 6 \times 0.0042$$

$$= 0.026$$

$r > 6PE$, therefore co-relation is significant

Calculation of Correlation between Assets and Net Profit of HBL

(Rs. in million)

Fiscal Year	Assets (x)	Net Profit (y)	$dx = \frac{dx}{(x - \bar{x})}$	dx^2	$dy = \frac{dy}{(y - \bar{y})}$	dy^2	$dx dy$
2004/05	27844.69	308.28	-5419.33	29369087.19	-220.97	48829.88	1197534.49
2005/06	29460.39	457.46	-3803.63	14467603.67	-71.79	5154.13	273071.38
2006/07	33519.14	491.82	255.12	65086.78	-37.43	1400.79	-9548.44
2007/08	36175.53	635.87	2911.51	8476896.30	106.62	11367.51	310420.99
2008/09	39320.32	752.83	6056.30	36678794.75	223.58	49990.13	1354096.69
	$\Sigma x =$ 166320.08	$\Sigma y =$ 2646.26	$\Sigma dx =$ -0.02	$\Sigma dx^2 =$ 89057468.70	$\Sigma dy =$ 0.01	$\Sigma dy^2 =$ 116742.44	$\Sigma dx dy =$ 3125575.12
	$\bar{x} =$ 33264.02	$\bar{y} =$ 529.25					

$$\begin{aligned}
 r_{xy} &= \frac{N \sum d_x d_y - \sum d_x \cdot \sum d_y}{\sqrt{N \sum d_x^2 - (\sum d_x)^2} \sqrt{N \sum d_y^2 - (\sum d_y)^2}} \\
 &= \frac{5 \times 3125575.12 - (-0.02 \times 0.01)}{\sqrt{5 \times 89057468.70 - (-0.02)^2} \sqrt{5 \times 116742.44 - (0.01)^2}} \\
 &= \frac{156278756}{\sqrt{4452873435} \sqrt{5837107}} \\
 &= \frac{156278756}{21101.83 \times 764} \\
 &= \frac{156278756}{1612180019} \\
 &= 0.969
 \end{aligned}$$

Calculation of Probable Error (P.E.):

$$\begin{aligned}
 P.E. &= 0.6745 \frac{1-r^2}{\sqrt{N}} \\
 &= 0.6745 \frac{1-0.969^2}{\sqrt{5}} \\
 &= 0.6745 \times 0.061 \\
 &= 0.041 \\
 6PEr &= 6 \times 0.041 \\
 &= 0.25
 \end{aligned}$$

$r > 6PE$, therefore co-relation is significant

APPENDIX - VII

Calculation of Deposit trend of NABIL bank for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	Deposit (y)	x ²	y ²	xy
2004/05	1	14586.61	1.00	212769132.95	14586.61
2005/06	2	19347.40	4.00	374321848.07	38694.80
2006/07	3	23342.29	9.00	544862269.02	70026.86
2007/08	4	31915.05	16.00	1018570225.01	127660.19
2008/09	5	37348.26	25.00	1394892151.55	186741.28
N = 5	Σx = 15	Σy = 126539.59	Σx ² = 55	Σy ² = 3545415626.59	Σxy = 437709.72

54

We have,

$$y = a + bx \quad (i) \quad \text{From eq}^n \text{ (iv) and (v)}$$

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad 5a + 15b = 126539.59 \quad (iv) \times 15$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii) \quad \underline{15a + 55b = 437709.72 \quad (v) \times 5}$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad 75a + 225b = 1898093.85$$

$$\text{Or, } 126539.59 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 126539.59 \quad (iv)$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii) \quad \text{Substituting the value of 'b' in eq}^n$$

$$\text{Or, } 437709.72 = a \times 15 + b \times 55 \quad (iv) \text{ we get,}$$

$$\text{Or, } 15a + 55b = 437709.72 \quad (v) \quad 5a + 15 \times 5809.095 = 126539.59$$

$$\text{Or, } a = 39403.165/5$$

$$\text{Or, } a = 7880.633$$

Now, calculation of future days deposit trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$y_{2009/10} = 7880.633 + 5809.095 \times 6$$

$$= 42735.20$$

$$y_{2010/11} = 7880.633 + 5809.095 \times 7$$

Now, calculation of future days deposit trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$y_{2009/10} = 2889.815 + 5662.44 \times 6$$

$$= 36864.455$$

$$y_{2010/11} = 2889.815 + 5662.44 \times 7$$

$$= 42526.895$$

$$y_{2011/12} = 2889.815 + 5662.44 \times 8$$

$$= 48189.335$$

$$y_{2012/13} = 2889.815 + 5662.44 \times 9$$

$$= 53851.775$$

$$y_{2013/14} = 2889.815 + 5662.44 \times 10$$

$$= 59514.215$$

Calculation of Deposit trend of HBL for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	Deposit (y)	x ²	y ²	xy
2004/05	1	24814.01	1.00	615735141.91	24814.01
2005/06	2	26490.85	4.00	701765186.70	52981.70
2006/07	3	30048.42	9.00	902907364.21	90145.25
2007/08	4	31842.79	16.00	1013963211.30	127371.16
2008/09	5	34681.35	25.00	1202795691.01	173406.73
N = 5	Σx = 15	Σy = 147877.41	Σx ² = 55	Σy ² = 4437166595.13	Σxy = 468718.85

We have,

$$y = a + bx \quad (i)$$

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

From eqⁿ (iv) and (v)

$$5a + 15b = 147877.41 \quad (iv) \times 15$$

$$15a + 55b = 468718.55 \quad (v) \times 5$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\text{Or, } 147877.41 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 147877.41 \quad (iv)$$

$$75a + 225b = 2218161.15$$

$$75a + 275b = 2343592.75$$

$$\underline{\quad - \quad - \quad - \quad}$$

$$0 \quad - 50b = - 125431.6$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + a\Sigma x^2 \quad (\text{iii})$$

$$\text{Or, } 468718.85 = a \times 15 + b \times 55$$

$$\text{Or, } 15a + 55b = 468718.55 \quad (\text{v})$$

$$\text{Or, } b = 2508.63$$

Substituting the value of 'b' in eqⁿ (iv) we get,

$$5a + 15 \times 2508.63 = 147877.41$$

$$\text{Or, } a = 110247.96/5$$

$$\text{Or, } a = 22049.592$$

Now, calculation of future days deposit trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$\begin{aligned} y_{2009/10} &= 22049.59 + 2508.63 \times 6 \\ &= 37101.37 \end{aligned}$$

$$\begin{aligned} y_{2010/11} &= 22049.59 + 2508.63 \times 7 \\ &= 39610 \end{aligned}$$

$$\begin{aligned} y_{2011/12} &= 22049.59 + 2508.63 \times 8 \\ &= 42118.63 \end{aligned}$$

$$\begin{aligned} y_{2012/13} &= 22049.59 + 2508.63 \times 9 \\ &= 44627.26 \end{aligned}$$

$$\begin{aligned} y_{2013/14} &= 22049.59 + 2508.63 \times 10 \\ &= 47135.89 \end{aligned}$$

$$y_{2011/12} = -1110.69 + 1459.61 \times 8$$

$$= 10566.19$$

$$y_{2012/13} = -1110.69 + 1459.61 \times 9$$

$$= 12025.80$$

$$y_{2013/14} = -1110.69 + 1459.61 \times 10$$

$$= 13485.41$$

Calculation of PML trend of EBL for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	PML (y)	x ²	xy
2004/05	1	647.59	1.00	647.59
2005/06	2	1108.53	4.00	2217.06
2006/07	3	2055.08	9.00	6165.24
2007/08	4	3667.82	16.00	14671.28
2008/09	5	6353.32	25.00	31766.60
N = 5	Σx = 15	Σy = 13832.34	Σx ² = 55	Σxy = 55467.77

We have,

$$y = a + bx \quad (i)$$

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

From eqⁿ (iv) and (v)

$$5a + 15b = 13832.34 \quad (iv) \times 15$$

$$15a + 55b = 55467.77 \quad (v) \times 5$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\text{Or, } 13832.34 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 13832.34 \quad (iv)$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

$$\text{Or, } 55467.77 = a \times 15 + b \times 55$$

$$\text{Or, } 15a + 55b = 55467.77 \quad (v)$$

$$75a + 225b = 207485.10$$

$$75a + 275b = 277338.85$$

$$\underline{\hspace{1cm}}$$

$$0 \quad - 50b = - 69853.75$$

$$\text{Or, } b = 1397.075$$

Substituting the value of 'b' in eqⁿ

(iv) we get,

$$5a + 15 \times 1397.075 = 13832.34$$

$$\text{Or, } a = - 7123.78/5$$

$$\text{Or, } a = -1424.76$$

Now, calculation of future day's PML trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$y_{2009/10} = -1424.76 + 1397.075 \times 6$$

$$= 6957.69$$

$$y_{2010/11} = -1424.76 + 1397.075 \times 7$$

$$= 8354.765$$

$$y_{2011/12} = -1424.76 + 1397.075 \times 8$$

$$= 9751.84$$

$$y_{2012/13} = -1424.76 + 1397.075 \times 9$$

$$= 11148.915$$

$$y_{2013/14} = -1424.76 + 1397.075 \times 10$$

$$= 12545.99$$

Calculation of PML trend of HBL for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	PML (y)	x^2	xy
2004/05	1	1118.21	1.00	1118.21
2005/06	2	1565.29	4.00	3130.58
2006/07	3	2158.75	9.00	6476.25
2007/08	4	2942.18	16.00	11768.72
2008/09	5	4445.41	25.00	22227.05
N = 5	$\Sigma x = 15$	$\Sigma y = 12229.84$	$\Sigma x^2 = 55$	$\Sigma xy = 44720.81$

We have,

$$y = a + bx \quad (i) \quad \text{Or, } 44720.81 = a \times 15 + b \times 55$$

$$\Sigma y = Na + b \Sigma x \quad (ii) \quad \text{Or, } 15a + 55b = 44720.81 \quad (v)$$

$$\Sigma xy = a \Sigma x + b \Sigma x^2 \quad (iii) \quad \text{From eq}^n \text{ (iv) and (v)}$$

$$\text{From eq}^n \text{ (ii) we get, } 5a + 15b = 12229.84 \quad (iv) \times 15$$

$$\Sigma y = Na + b \Sigma x \quad (ii) \quad \underline{15a + 55b = 44720.81 \quad (v) \times 5}$$

$$\text{Or, } 12229.84 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 12229.84 \quad (iv) \quad 75a + 225b = 183447.60$$

$$\text{From eq}^n \text{ (iii) we get } 75a + 275b = 223604.05$$

$$\Sigma xy = a \Sigma x + b \Sigma x^2 \quad (iii) \quad \begin{array}{r} - \\ - \\ - \\ \hline \end{array}$$

$$0 \quad - 50b = -40156.45$$

$$\text{Or, } b = 803.13$$

Substituting the value of 'b' in eqⁿ

(iv) we get,

$$5a + 15 \times 803.13 = 12229.84$$

$$\text{Or, } a = 182.89/5$$

$$\text{Or, } a = 36.58$$

Now, calculation of future day's PML trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$\begin{aligned} y_{2009/10} &= 36.58 + 803.13 \times 6 \\ &= 4855.36 \end{aligned}$$

$$\begin{aligned} y_{2010/11} &= 36.58 + 803.13 \times 7 \\ &= 5658.49 \end{aligned}$$

$$\begin{aligned} y_{2011/12} &= 36.58 + 803.13 \times 8 \\ &= 6461.62 \end{aligned}$$

$$\begin{aligned} y_{2012/13} &= 36.58 + 803.13 \times 9 \\ &= 7264.75 \end{aligned}$$

$$\begin{aligned} y_{2013/14} &= 36.58 + 803.13 \times 10 \\ &= 8067.88 \end{aligned}$$

APPENDIX - IX

Calculation of IPML trend of NABIL bank for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	IPML (y)	x ²	xy
2004/05	1	94.65	1.00	94.65
2005/06	2	162.70	4.00	325.40
2006/07	3	260.92	9.00	782.76
2007/08	4	465.91	16.00	1863.64
2008/09	5	869.00	25.00	4345.00
N = 5	Σx = 15	Σy = 1853.18	Σx ² = 55	Σxy = 7411.45

We have,

$$y = a + bx \quad (i) \quad \text{From eq}^n \text{ (iv) and (v)}$$

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad 5a + 15b = 1853.18 \quad (iv) \times 15$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii) \quad \underline{15a + 55b = 7411.45 \quad (v) \times 5}$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad 75a + 225b = 27797.70$$

$$\text{Or, } 1853.18 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 1853.18 \quad (iv) \quad \begin{array}{r} - \quad - \quad - \\ 0 \quad - 50b = - 9259.55 \end{array}$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + a\Sigma x^2 \quad (iii) \quad \text{Substituting the value of 'b' in eq}^n$$

$$\text{Or, } 7411.45 = a \times 15 + b \times 55 \quad (iv) \text{ we get,}$$

$$\text{Or, } 15a + 55b = 7411.45 \quad (v) \quad 5a + 15 \times 185.19 = 1853.18$$

$$\text{Or, } a = -924.67/5$$

$$\text{Or, } a = - 184.93$$

Now, calculation of future day's IPML trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$y_{2009/10} = -184.93 + 185.19 \times 6$$

$$= 926.21$$

$$y_{2010/11} = -184.93 + 185.19 \times 7$$

$$= 1111.40$$

$$y_{2011/12} = -184.93 + 185.19 \times 8$$

$$= 1296.59$$

$$y_{2012/13} = -184.93 + 185.19 \times 9$$

$$= 1481.78$$

$$y_{2013/14} = -184.93 + 185.19 \times 10$$

$$= 1666.97$$

Calculation of IPML trend of EBL for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	IPML (y)	x ²	xy
2004/05	1	59.12	1.00	59.12
2005/06	2	109.52	4.00	219.04
2006/07	3	207.36	9.00	622.08
2007/08	4	286.22	16.00	1144.88
2008/09	5	681.71	25.00	3408.55
N = 5	Σx = 15	Σy = 1343.93	Σx ² = 55	Σxy = 5453.67

We have,

$$y = a + bx \quad (i) \quad \text{From eq}^n \text{ (iv) and (v)}$$

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad 5a + 15b = 1343.93 \quad (iv) \times 15$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii) \quad \underline{15a + 55b = 5453.67} \quad (v) \times 5$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii) \quad \begin{array}{r} 75a + 225b = 20158.95 \\ 75a + 275b = 27268.35 \\ \hline 0 \quad -50b = -7109.40 \end{array}$$

$$\text{Or, } 1343.93 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 1343.93 \quad (iv)$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

$$\text{Or, } 5453.67 = a \times 15 + b \times 55$$

$$\text{Or, } 15a + 55b = 5453.67 \quad (v)$$

$$75a + 225b = 20158.95$$

$$75a + 275b = 27268.35$$

$$\hline$$

$$0 \quad -50b = -7109.40$$

$$\text{Or, } b = 142.19$$

Substituting the value of 'b' in eqⁿ

(iv) we get,

$$5a + 15 \times 142.19 = 1343.93$$

$$\text{Or, } a = -788.89/5$$

$$\text{Or, } a = -157.78$$

Now, calculation of future day's IPML trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$y_{2009/10} = -157.78 + 142.19 \times 6 \\ = 695.36$$

$$y_{2010/11} = -157.78 + 142.19 \times 7 \\ = 837.55$$

$$y_{2011/12} = -157.78 + 142.19 \times 8 \\ = 979.74$$

$$y_{2012/13} = -157.78 + 142.19 \times 9 \\ = 1121.93$$

$$y_{2013/14} = -157.78 + 142.19 \times 10 \\ = 1264.12$$

Calculation of IPML trend of HBL for next 5 years

(Rs. in million)

Fiscal Year	Year duration (x)	IPML (y)	x^2	xy
2004/05	1	107.24	1.00	107.24
2005/06	2	164.83	4.00	329.66
2006/07	3	232.07	9.00	696.21
2007/08	4	295.98	16.00	1183.92
2008/09	5	515.22	25.00	2576.10
N = 5	$\Sigma x = 15$	$\Sigma y = 1315.34$	$\Sigma x^2 = 55$	$\Sigma xy = 4893.13$

We have,

$$y = a + bx \quad (i)$$

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

$$\text{Or, } 4893.13 = a \times 15 + b \times 55$$

$$\text{Or, } 15a + 55b = 4893.13 \quad (v)$$

From eqⁿ (iv) and (v)

$$5a + 15b = 1315.34 \quad (iv) \times 15$$

$$\underline{15a + 55b = 4893.13} \quad (v) \times 5$$

$$75a + 225b = 19730.10$$

$$75a + 275b = 24465.65$$

$$\underline{\quad - \quad - \quad - \quad - \quad -}$$

$$0 \quad - 50b = - 4735.55$$

From eqⁿ (ii) we get,

$$\Sigma y = Na + b\Sigma x \quad (ii)$$

$$\text{Or, } 1315.34 = 5a + b \times 15$$

$$\text{Or, } 5a + 15b = 1315.34 \quad (iv)$$

From eqⁿ (iii) we get

$$\Sigma xy = a\Sigma x + b\Sigma x^2 \quad (iii)$$

$$\text{Or, } b = 94.711$$

Substituting the value of 'b' in eqⁿ

(iv) we get,

$$5a + 15 \times 94.711 = 1315.34$$

$$\text{Or, } a = 105.325/5$$

$$\text{Or, } a = -21.065$$

Now, calculation of future day's IPML trend

Substituting the value of 'a' & 'b' in eqⁿ (i) we get,

$$y = a + bx$$

$$\begin{aligned} y_{2009/10} &= -21.065 + 94.711 \times 6 \\ &= 547.20 \end{aligned}$$

$$\begin{aligned} y_{2010/11} &= -21.065 + 94.711 \times 7 \\ &= 641.91 \end{aligned}$$

$$\begin{aligned} y_{2011/12} &= -21.065 + 94.711 \times 8 \\ &= 736.62 \end{aligned}$$

$$\begin{aligned} y_{2012/13} &= -21.065 + 94.711 \times 9 \\ &= 831.33 \end{aligned}$$

$$\begin{aligned} y_{2013/14} &= -21.065 + 94.711 \times 10 \\ &= 926.05 \end{aligned}$$

Appendix – X

Calculation of PML to TD ratio for Hypothesis

(Rs. in million)

Year	NABIL			EBL			HBL		
	PML	TD	PML to TD ratio	PML	TD	PML to TD ratio	PML	TD	PML to TD ratio
2004/05	1032.15	14586.61	0.07	647.59	10097.69	0.06	1118.21	24814.01	0.05
2005/06	1599.81	19347.40	0.08	1108.53	13802.44	0.08	1565.29	26490.85	0.06
2006/07	2445.35	23342.29	0.10	2055.08	18186.25	0.11	2158.75	30048.42	0.07
2007/08	4266.60	31915.05	0.13	3667.82	23976.30	0.15	2942.18	31842.79	0.09
2008/09	6996.81	37348.26	0.19	6353.32	33322.95	0.19	4445.41	34681.35	0.13