KCL Astute Capital Research Team

Value at Risk: VAR is one of the popular measure to quantitatively quantify the investment risk present in the underlying securities, particularly the banking scripts. It provides the probable loss in a security or portfolio value over a specified time period.

The table below shows the Market VAR of 27 Commercial Banks under different methods of computation:

Method 1: Parametric / Variance – Covariance Method

S.N.	Ticker	Daily Return	Daily Std. Dev.	1 Day VAR			1 Week VAR			1 Month VAR		
				10%	5%	1%	10%	5%	1%	10%	5%	1%
1	NMB	0.12%	2.37%	-2.91%	-3.78%	-5.39%	-6.52%	-8.44%	-12.05%	-13.35%	-17.30%	-24.70%
2	BOKL	0.05%	2.20%	-2.76%	-3.56%	-5.06%	-6.18%	-7.96%	-11.31%	-12.66%	-16.32%	-23.18%
3	GBIME	0.11%	2.19%	-2.69%	-3.49%	-4.98%	-6.02%	-7.80%	-11.14%	-12.35%	-16.00%	-22.84%
4	SCB	0.06%	2.13%	-2.68%	-3.45%	-4.91%	-5.99%	-7.72%	-10.97%	-12.27%	-15.82%	-22.49%
5	PCBL	0.12%	2.12%	-2.60%	-3.37%	-4.81%	-5.81%	-7.53%	-10.76%	-11.90%	-15.43%	-22.04%
6	NIB	0.11%	2.09%	-2.57%	-3.33%	-4.75%	-5.74%	-7.44%	-10.63%	-11.77%	-15.25%	-21.78%
7	NBL	0.09%	2.07%	-2.57%	-3.32%	-4.73%	-5.74%	-7.42%	-10.57%	-11.76%	-15.20%	-21.66%
8	JBNL	0.07%	2.05%	-2.56%	-3.31%	-4.71%	-5.73%	-7.40%	-10.53%	-11.75%	-15.17%	-21.58%
9	NICA	0.10%	2.06%	-2.54%	-3.29%	-4.70%	-5.69%	-7.36%	-10.51%	-11.65%	-15.09%	-21.54%
10	HBL	0.10%	2.06%	-2.54%	-3.29%	-4.69%	-5.68%	-7.35%	-10.49%	-11.63%	-15.06%	-21.50%
11	ADBL	0.13%	2.07%	-2.52%	-3.27%	-4.68%	-5.64%	-7.32%	-10.47%	-11.56%	-15.00%	-21.45%
12	SBI	0.09%	2.02%	-2.50%	-3.23%	-4.61%	-5.59%	-7.23%	-10.30%	-11.45%	-14.81%	-21.12%
13	NABIL	0.08%	2.01%	-2.50%	-3.23%	-4.60%	-5.59%	-7.22%	-10.29%	-11.45%	-14.80%	-21.09%
14	NCCB	0.09%	2.01%	-2.48%	-3.21%	-4.58%	-5.55%	-7.18%	-10.24%	-11.38%	-14.71%	-20.98%
15	MEGA	0.12%	2.03%	-2.47%	-3.21%	-4.59%	-5.53%	-7.18%	-10.27%	-11.34%	-14.71%	-21.04%
16	PRVU	0.10%	1.99%	-2.45%	-3.17%	-4.53%	-5.48%	-7.09%	-10.12%	-11.23%	-14.54%	-20.75%
17	MBL	0.12%	2.00%	-2.44%	-3.17%	-4.53%	-5.46%	-7.08%	-10.13%	-11.18%	-14.51%	-20.75%
18	EBL	0.09%	1.97%	-2.43%	-3.15%	-4.49%	-5.44%	-7.04%	-10.05%	-11.15%	-14.44%	-20.60%
19	KBL	0.07%	1.93%	-2.40%	-3.10%	-4.42%	-5.37%	-6.94%	-9.89%	-11.01%	-14.23%	-20.26%
20	CBL	0.04%	1.90%	-2.39%	-3.08%	-4.38%	-5.35%	-6.89%	-9.79%	-10.96%	-14.12%	-20.06%
21	SRBL	0.09%	1.92%	-2.37%	-3.07%	-4.38%	-5.31%	-6.87%	-9.80%	-10.88%	-14.08%	-20.08%
22	LBL	0.07%	1.86%	-2.31%	-2.99%	-4.25%	-5.17%	-6.68%	-9.51%	-10.59%	-13.69%	-19.50%
23	NBB	0.08%	1.86%	-2.30%	-2.98%	-4.25%	-5.15%	-6.66%	-9.50%	-10.55%	-13.65%	-19.46%
24	CCBL	0.03%	1.78%	-2.25%	-2.90%	-4.12%	-5.04%	-6.48%	-9.20%	-10.32%	-13.29%	-18.86%
25	SBL	0.10%	1.83%	-2.25%	-2.92%	-4.17%	-5.03%	-6.52%	-9.32%	-10.32%	-13.37%	-19.10%
26	SANIMA	0.09%	1.74%	-2.13%	-2.76%	-3.95%	-4.77%	-6.18%	-8.82%	-9.77%	-12.66%	-18.08%
27	CZBIL	0.07%	1.71%	-2.12%	-2.74%	-3.90%	-4.74%	-6.12%	-8.72%	-9.71%	-12.55%	-17.88%

Limitation:

✓   Assumes normal distribution

Interpretation: NMB - 1 Day 10% VAR can be interpreted in two ways as below:

I.   There is 90% probability that the loss on investment in NMB will be less than 2.91% in any 1 normal trading day. OR

II. There is 10% chances that the loss on investment in NMB will be 2.91% or more in any 1 normal trading day.

Highest VAR: NMB   **Lowest VAR: CZBIL**

Method 2: Non-Parametric Method / Historical Simulation Method

S.N.	Ticker	1 Day VAR			1 Week VAR			1 Month VAR		
		10%	5%	1%	10%	5%	1%	10%	5%	1%
1	NMB	-2.24%	-3.30%	-5.59%	-5.00%	-7.37%	-12.50%	-10.25%	-15.10%	-25.61%
2	NCCB	-2.18%	-2.78%	-5.29%	-4.88%	-6.23%	-11.83%	-10.00%	-12.76%	-24.25%
3	JBNL	-2.13%	-2.78%	-5.26%	-4.76%	-6.22%	-11.76%	-9.75%	-12.74%	-24.10%
4	NBL	-2.06%	-2.92%	-5.12%	-4.60%	-6.52%	-11.45%	-9.42%	-13.37%	-23.47%
5	KBL	-2.00%	-2.63%	-4.65%	-4.48%	-5.87%	-10.40%	-9.18%	-12.03%	-21.31%
6	GBIME	-2.00%	-2.74%	-4.60%	-4.47%	-6.13%	-10.30%	-9.15%	-12.57%	-21.10%
7	HBL	-1.99%	-2.84%	-4.88%	-4.45%	-6.36%	-10.90%	-9.12%	-13.04%	-22.34%
8	SCB	-1.97%	-2.76%	-6.09%	-4.40%	-6.17%	-13.62%	-9.01%	-12.65%	-27.91%
9	BOKL	-1.95%	-2.75%	-4.72%	-4.37%	-6.14%	-10.56%	-8.95%	-12.59%	-21.65%
10	ADBL	-1.95%	-2.71%	-4.83%	-4.36%	-6.06%	-10.80%	-8.94%	-12.42%	-22.13%
11	NBB	-1.95%	-2.59%	-4.26%	-4.35%	-5.78%	-9.52%	-8.92%	-11.85%	-19.52%
12	CBL	-1.94%	-2.53%	-4.56%	-4.35%	-5.65%	-10.20%	-8.90%	-11.58%	-20.90%
13	MBL	-1.93%	-2.55%	-4.14%	-4.32%	-5.71%	-9.26%	-8.86%	-11.70%	-18.97%
14	NICA	-1.91%	-2.72%	-4.83%	-4.28%	-6.09%	-10.80%	-8.77%	-12.47%	-22.13%
15	SRBL	-1.91%	-2.68%	-4.62%	-4.26%	-5.99%	-8.74%	-8.74%	-12.28%	-21.19%
16	LBL	-1.89%	-2.61%	-4.57%	-4.22%	-5.83%	-10.21%	-8.65%	-11.94%	-20.93%
17	PCBL	-1.86%	-2.55%	-4.77%	-4.16%	-5.70%	-10.67%	-8.53%	-11.68%	-21.86%
18	SBI	-1.85%	-2.77%	-4.79%	-4.14%	-6.20%	-10.71%	-8.48%	-12.71%	-21.95%
19	MEGA	-1.81%	-2.27%	-4.31%	-4.05%	-5.07%	-9.63%	-8.30%	-10.39%	-19.74%
20	NABIL	-1.80%	-2.58%	-5.58%	-4.02%	-5.76%	-12.49%	-8.23%	-11.80%	-25.59%
21	SBL	-1.78%	-2.38%	-4.23%	-3.99%	-5.32%	-9.45%	-8.17%	-10.91%	-19.37%
22	PRVU	-1.78%	-2.39%	-4.42%	-3.98%	-5.34%	-9.88%	-8.16%	-10.95%	-20.25%
23	NIB	-1.78%	-2.49%	-4.86%	-3.97%	-5.56%	-10.88%	-8.14%	-11.40%	-22.29%
24	CCBL	-1.77%	-2.41%	-4.13%	-3.95%	-5.38%	-9.23%	-8.10%	-11.03%	-18.92%
25	EBL	-1.76%	-2.49%	-5.55%	-3.93%	-5.57%	-12.40%	-8.06%	-11.41%	-25.41%
26	CZBIL	-1.73%	-2.32%	-3.77%	-3.87%	-5.19%	-8.44%	-7.93%	-10.64%	-17.29%
27	SANIMA	-1.63%	-2.41%	-4.49%	-3.65%	-5.38%	-10.03%	-7.48%	-11.02%	-20.56%

Advantages:

✓ No assumption of normal distribution

Limitation:

✓ Solely based on historical prices which may not be reflective for futures.

Interpretation:　Same as Method 1.

1 Day/ Week/ Month		
VaR	*Highest*	*Lowest*
10%	NMB	SANIMA
5%	NMB	MEGA
1%	SCB	CZBIL

Expected Shortfall: One limitation of Market VAR is that it does not specify or hint the magnitude of losses in the security or portfolio. For example, 1 Day 10% VAR of NMB does not tell the magnitude of losses exceeding 2.91% in any 1 normal trading day. Expected shortfall provides an estimate of average tail losses likely on a portfolio / investments when VaR limit is exceeded on a given significance level. It is also referred as Conditional VaR.

Expected Shortfall (ES) / Conditional VAR (CVAR)

| S.N.	Ticker	1 Day ES			1 Week ES			1 Month ES		
		10%	5%	1%	10%	5%	1%	10%	5%	1%
1	NMB	-3.74%	-4.69%	-7.00%	-8.36%	-10.48%	-15.66%	-17.14%	-21.48%	-32.09%
2	SCB	-3.44%	-4.58%	-8.03%	-7.69%	-10.25%	-17.95%	-15.76%	-21.00%	-36.79%
3	NBL	-3.35%	-4.21%	-6.80%	-7.48%	-9.42%	-15.21%	-15.34%	-19.30%	-31.18%
4	SBI	-3.31%	-4.16%	-6.70%	-7.41%	-9.30%	-14.99%	-15.18%	-19.06%	-30.72%
5	HBL	-3.28%	-4.22%	-6.91%	-7.34%	-9.43%	-15.45%	-15.04%	-19.33%	-31.66%
6	JBNL	-3.28%	-4.14%	-7.02%	-7.34%	-9.25%	-15.70%	-15.03%	-18.96%	-32.17%
7	NCCB	-3.27%	-4.07%	-6.18%	-7.31%	-9.09%	-13.83%	-14.97%	-18.64%	-28.34%
8	BOKL	-3.25%	-4.19%	-7.32%	-7.28%	-9.37%	-16.37%	-14.91%	-19.20%	-33.55%
9	NABIL	-3.23%	-4.33%	-7.57%	-7.22%	-9.69%	-16.94%	-14.80%	-19.86%	-34.71%
10	NICA	-3.16%	-4.06%	-6.44%	-7.08%	-9.09%	-14.41%	-14.50%	-18.63%	-29.53%
11	EBL	-3.15%	-4.23%	-7.67%	-7.04%	-9.45%	-17.16%	-14.44%	-19.36%	-35.17%
12	ADBL	-3.13%	-3.97%	-5.97%	-7.00%	-8.87%	-13.35%	-14.35%	-18.17%	-27.37%
13	NIB	-3.13%	-4.19%	-7.38%	-7.00%	-9.38%	-16.50%	-14.34%	-19.22%	-33.81%
14	GBIME	-3.12%	-3.94%	-5.92%	-6.98%	-8.81%	-13.23%	-14.31%	-18.05%	-27.12%
15	PCBL	-3.11%	-4.04%	-6.56%	-6.95%	-9.03%	-14.67%	-14.25%	-18.50%	-30.07%
16	SRBL	-3.04%	-3.82%	-5.54%	-6.80%	-8.55%	-12.38%	-13.93%	-17.52%	-25.38%
17	MEGA	-3.02%	-4.00%	-7.87%	-6.76%	-8.95%	-17.60%	-13.85%	-18.35%	-36.07%
18	KBL	-3.01%	-3.78%	-5.89%	-6.72%	-8.46%	-13.16%	-13.77%	-17.33%	-26.97%
19	CBL	-2.94%	-3.67%	-5.80%	-6.58%	-8.21%	-12.96%	-13.48%	-16.83%	-26.56%
20	PRVU	-2.93%	-3.83%	-6.82%	-6.54%	-8.57%	-15.24%	-13.41%	-17.56%	-31.24%
21	NBB	-2.91%	-3.58%	-5.24%	-6.51%	-8.00%	-11.73%	-13.34%	-16.40%	-24.03%
22	LBL	-2.91%	-3.66%	-5.81%	-6.50%	-8.18%	-12.98%	-13.33%	-16.77%	-26.61%
23	MBL	-2.85%	-3.48%	-5.14%	-6.38%	-7.77%	-11.50%	-13.08%	-15.93%	-23.56%
24	CCBL	-2.81%	-3.51%	-5.29%	-6.27%	-7.86%	-11.83%	-12.86%	-16.10%	-24.24%
25	SBL	-2.75%	-3.45%	-5.42%	-6.14%	-7.71%	-12.12%	-12.58%	-15.80%	-24.84%
26	SANIMA	-2.73%	-3.53%	-5.58%	-6.11%	-7.89%	-12.48%	-12.52%	-16.17%	-25.57%
27	CZBIL	-2.61%	-3.19%	-4.95%	-5.84%	-7.14%	-11.07%	-11.96%	-14.63%	-22.69%

Interpretation: NMB - 1 Day 10% ES can be interpreted as below:

I. There is 10% probability that the average losses on investment in NMB will be 3.74% on any single trading day, if loss exceeds 2.91% (VaR).

1 Day/ Week/ Month		
VaR	*Highest*	*Lowest*
10%	NMB	CZBIL
5%	NMB	CZBIL
1%	SCB	CZBIL

NEPSE VaR				Commercial Bank VaR		
Daily mean	0.06%			0.06%		
Daily Std. Dev.	1.19%			1.58%		
Parametric Approach				**Parametric Approach**		
	10%	*5%*	*1%*	*10%*	*5%*	*1%*
1 Day	-1.47%	-1.90%	-2.71%	-1.96%	-2.54%	-3.61%
1 Week	-3.28%	-4.25%	-6.07%	-4.39%	-5.68%	-8.08%
1 Month	-6.73%	-8.72%	-12.44%	-9.00%	-11.63%	-16.57%
Non Parametric Approach				**Non Parametric Approach**		
1 Day	-1.14%	-1.74%	-3.28%	-1.43%	-2.14%	-4.56%
1 Week	-2.54%	-3.90%	-7.34%	-3.19%	-4.79%	-10.19%
1 Month	-5.20%	-8.00%	-15.05%	-6.54%	-9.82%	-20.88%
Expected Shortfall				**Expected Shortfall**		
1 Day	-1.93%	-2.68%	-4.30%	-2.64%	-3.54%	-5.94%
1 Week	-4.33%	-5.99%	-9.62%	-5.90%	-7.92%	-13.28%
1 Month	-8.86%	-12.27%	-19.72%	-12.09%	-16.23%	-27.21%

NEPSE - 1 DAY VAR - PARAMETRIC
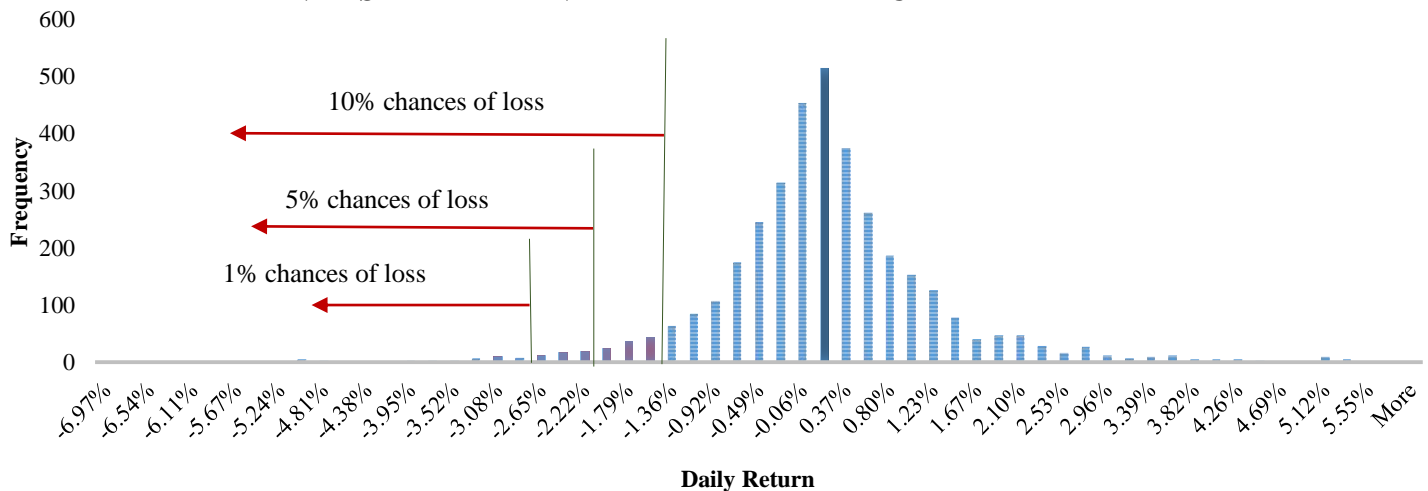
COMMERCIAL BANKS - 1 DAY VAR - PARAMETRIC
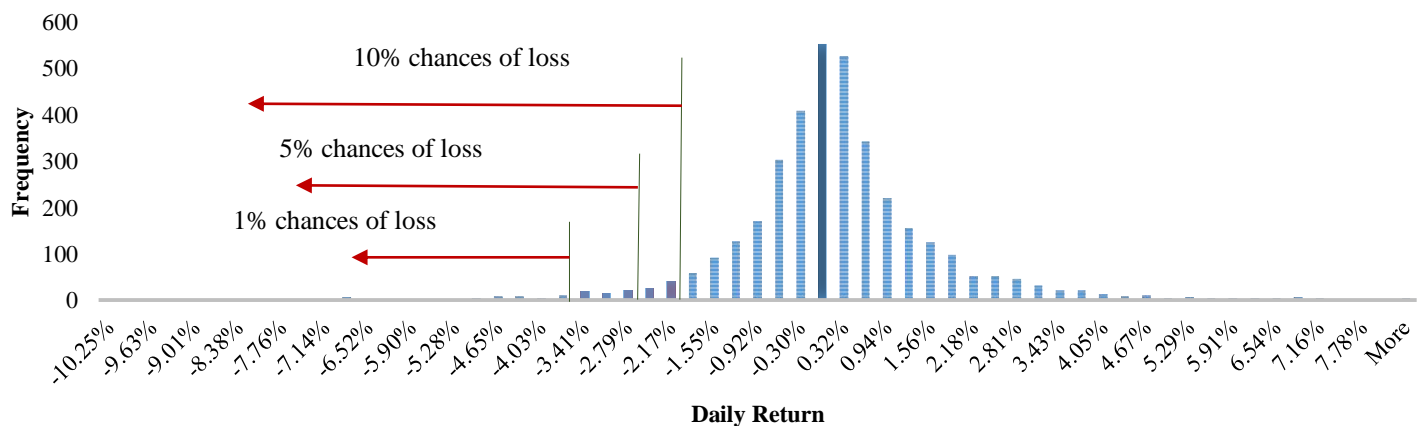
Assumption:
a. *Daily adjusted prices of stocks till 14th May 2019.*
b. *5 trading days assumed for 1 Week calculation.*
c. *21 trading days assumed for 1 Month calculation.*