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Market Efficiency of Few Bank Stocks: An Empirical Study

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Abstract: *This paper deals with the analyzing the efficiency of Indian U.S. bank Stocks. In an efficient market, security price should equal the security's investment value, where investment value is the discounted value of the security's future cash flows. According to EMH, if there is a possibility to predict the future price of share, that is the first sign of an inefficient market. In the present study, the prices of few bank share prices are taken from www.finance.yahoo.com. This study concludes that the stocks which are analyzed are efficient in weak form. The tool used in this analysis is Run Test. In majority of the cases, the observed runs fall in between the calculated runs.*

I. Introduction

According to EMH, each security price always stays at its equilibrium and it reflects all publicly available information, in a perfect market. The share price depends on many factors. These factors enter the market at random basis and changes the share prices. This is known as Random Walk Hypothesis.

The efficient market hypothesis is subdivided into three:
a. Weak form
b. Semi - strong form
c. Strong form

Weak form: Market is said to be weak form when prices of each security fluctuates on the basis of historical data. As a result, it fails to support technical analysis.

Semi - strong form: The stock prices also fluctuates based on the information that are revealed to public. Every company reveals the financial data like profit and loss account and balance sheet and also any other sensitive data to the public at the same time. Hence, this market does not support fundamental analysis where prices of shares are predicted based on available information.

Strong form: According to this market, prices fluctuates based on available information and insider information. Hence, there is no use of gathering insider information.

Test Of Market Efficiency: The present study tested the market efficiency using the tool "RUN TEST". It is non – parametric statistical tool where positive and negative fluctuations are taken into consideration.

Objectives Of The Study: To analyze the efficiency of U.S. bank stocks

Hypothesis
H_o : "Security prices change at random"
H_a: " Security prices change is not at random"
Hypothesis was tested at 20% significance level at which 'Z' value is 1.28

Research Methodology
Type of Research : Empirical
Sample Design : Convenience sampling
Sample size : 9 bank companies from NASDAQ
Data Source : www.finance.yahoo.com
Type of Data : Secondary
Tools for Analysis : Run test

Research Plan: The research consists of bank weekly closing prices of bank companies from NASDAQ.

Scope Of The Study: The study is conducted for one year period i.e. June 1st 2014 to May 31st 2015.

Limitations Of The Study

1. The findings are based on the Run test; hence the limitations in this tool are carried forward to this analysis also.
2. Findings are applicable in the situation, which prevailed in the year 2014-2015; hence these should be read in the light of these factors.

Date	ACNB	R	AMNB	R	BANF	R	CBNJ	R	CFNB	R	CCBG	R	EVBS	R	FBSS	R	GABC	R
2 Jun, 2014	19.4		22.64		60.99		10.89		14.72		13.77		6.73		15.75		27.78	
9 Jun, 2014	19.5	+	22	-	60.81	-	10.49	-	14.95	+	13.36	-	6.56	-	15.6	-	26.92	-
16 Jun, 2014	19.5	+	22.18	+	62.05	+	10.64	+	14.27	-	13.5	+	6.57	+	15.5	-	27.33	+
23 Jun, 2014	19.26	-	21.94	-	62.15	+	10.87	+	14.51	+	14.38	+	6.3	-	15.2	-	27.11	-
30 Jun, 2014	19.33	+	22.62	+	63.36	+	10.73	-	14.67	+	14.13	-	6.26	-	15.98	+	27.74	+
7 Jul, 2014	19.48	+	22.05	-	60.82	-	10.73	+	15.13	+	13.76	-	6.21	-	15.86	-	26.39	-
14 Jul, 2014	19.42	-	21.63	-	62	+	10.34	-	15.07	-	13.6	-	6.21	+	15.95	+	26.5	+
21 Jul, 2014	19.11	-	21.51	-	60.84	-	10.42	+	14.65	-	13.41	-	6.3	+	15.7	-	26.01	-
28 Jul, 2014	18.79	-	21.53	+	60.13	-	10.13	-	14.65	+	13.66	+	6.34	+	15.32	-	25.89	-
4 Aug, 2014	18.9	+	21.36	-	60.48	+	10.16	+	14.77	+	13.87	+	6.31	-	15.9	+	26.24	+
11 Aug, 2014	19.08	+	21.2	-	60.26	-	10.23	+	14.37	-	13.63	-	6.23	-	15.76	-	26.37	+
18 Aug, 2014	19	-	21.97	+	62.25	+	10.28	+	14.35	-	13.93	+	6.17	-	15.94	+	27.2	+
25 Aug, 2014	19.24	+	22.14	+	63.64	+	10.26	-	14.55	+	14.02	+	6.23	+	16.37	+	27.09	-
2 Sep, 2014	19.24	+	22.15	+	64.2	+	10.14	-	14.55	+	13.94	-	6.38	+	15.79	-	26.9	-
8 Sep, 2014	19.2	-	22.13	-	64.96	+	9.36	-	14.65	+	14.1	+	6.22	-	16.5	+	27.15	+
15 Sep, 2014	19.6	+	22.97	+	66.52	+	9.45	+	14.66	+	13.92	-	6.38	+	16.5	+	27.14	-
22 Sep, 2014	19.25	-	22.92	-	64.09	-	9.4	-	14.97	+	13.65	-	6.22	-	16.3	-	26.42	-
29 Sep, 2014	19.15	-	22.09	-	62.96	-	9.39	-	14.8	-	13.4	-	6.2	-	16.26	-	26.24	-
6 Oct, 2014	19.08	-	22	-	62.86	-	9.32	-	14.77	-	13.8	+	6.17	-	17.61	+	26.2	-
13 Oct, 2014	19.29	+	22.61	+	63.72	+	9.13	-	14.55	-	14.68	+	6.18	+	21.5	+	26.99	+
20 Oct, 2014	19.45	+	22.83	+	64.72	+	9.05	-	15	+	14.36	-	6.17	-	19.59	-	27	+
27 Oct, 2014	19.5	+	24.2	+	65	+	8.91	-	15.04	+	15.11	+	6.02	-	20	+	29.87	+
3 Nov, 2014	19.6	+	24.31	+	66.46	+	9.1	+	14.85	-	14.94	-	6.13	+	18.41	-	29.67	-
10 Nov, 2014	19.72	+	24.5	+	68.8	+	9.23	+	14.87	+	14.82	-	6.27	+	18.75	+	29.38	-
17 Nov, 2014	19.93	+	23.28	-	65.93	-	9.12	-	14.7	-	14.68	-	6.32	+	19.7	+	28.97	-
24 Nov, 2014	20.25	+	23.55	+	64.01	-	9.31	+	14.17	-	14.46	-	6.47	+	19.68	-	28.26	-
1 Dec, 2014	20.5	+	23.15	-	64	-	9.22	-	14.78	+	15.06	+	6.37	-	18.66	-	29.2	+
8 Dec, 2014	21.3	+	23.25	+	62.47	-	9.15	-	14.4	-	15.11	+	6.33	-	19.49	+	28.49	-
15 Dec, 2014	20.4	-	24.24	+	62.71	+	9.4	+	14.35	-	15.21	+	6.27	-	19.6	+	29.99	+
22 Dec, 2014	20.66	+	24.84	+	63.98	+	9.27	-	14.24	-	15.81	+	6.46	+	19.6	+	30.49	+
29 Dec, 2014	21.35	+	24.04	-	62.67	-	9.34	+	13.93	-	15.7	-	6.4	-	20.64	+	29.39	-
5 Jan, 2015	20.95	-	23.2	-	59.11	-	9.23	-	13.79	-	15.09	-	6.42	+	19.9	-	28.31	-
12 Jan, 2015	20.32	-	21.98	-	56.76	-	9.06	-	13.61	-	14.94	-	6.3	-	20.6	+	28.76	+
20 Jan, 2015	20.3	-	22.05	+	59.32	+	8.97	-	14.23	+	14.8	-	6.25	-	19.55	-	29.12	+
26 Jan, 2015	20.02	-	21.52	-	57.66	-	8.63	-	13.8	-	15	+	6.25	+	18.97	-	28	-
2 Feb, 2015	20	-	23.37	+	60.68	+	8.73	+	14.22	+	15.42	+	6.29	+	18.05	-	28.95	+
9 Feb, 2015	20.06	+	23.04	-	59.91	-	8.82	+	14.1	-	15.25	-	6.27	-	17.59	-	28.99	+
17 Feb, 2015	20.25	+	22.1	-	58.97	-	8.76	-	14.16	+	15.55	+	6.22	-	16.25	-	29.18	+
23 Feb, 2015	20.55	+	22.59	+	59.38	+	8.93	+	14	-	15.47	-	6.27	+	17.15	+	28.71	-
2 Mar, 2015	20.25	-	21.78	-	59.93	+	9.1	+	13.76	-	15.45	-	6.29	+	16.7	-	28.26	-
9 Mar, 2015	20.5	+	22.21	+	60.01	+	9.1	+	13.9	+	15.79	+	6.3	+	17.21	+	28.89	+
16 Mar, 2015	20.53	+	22.89	+	60.64	+	9.36	+	14.19	+	15.66	-	6.17	-	16.5	-	29.51	+
23 Mar, 2015	20.25	-	22.56	-	61.39	+	9.55	+	13.97	-	16	+	6.2	+	16.7	+	29.42	-
30 Mar, 2015	20.3	+	22.55	-	61.35	-	9.7	+	13.81	-	16.24	+	6.07	-	17.36	+	30	+
6 Apr, 2015	20.48	+	22.32	-	59.58	-	9.4	-	13.62	-	15.95	-	6.12	+	16.72	-	29.46	-
13 Apr, 2015	20.48	+	21.86	-	59.55	-	9.29	-	13.72	+	15.75	-	6.05	-	16.95	+	29	-
20 Apr, 2015	20.89	+	22.24	+	59.52	-	9.45	+	13.77	+	15.95	+	6.24	+	17.2	+	29.5	+
27 Apr, 2015	20.89	+	22.78	+	57.8	-	9.89	+	13.6	-	14.43	-	6.46	+	16.88	-	28.65	-
4 May, 2015	20.45	-	22.5	-	58.14	+	9.65	-	13.56	-	14.74	+	6.33	-	16.95	+	28.46	-
11 May, 2015	20.22	-	22.1	-	57.98	-	9.76	+	13.64	+	14.69	-	6.31	-	16.62	-	28.34	-
18 May, 2015	20.3	+	22.2	+	57.94	-	9.65	-	13.57	-	14.35	-	6.19	-	16.97	+	28.66	+
26 May, 2015	20.17	-	22.67	+	58.29	+	9.58	-	13.63	+	14.43	+	5.94	-	16.7	-	29.02	+

Analysis Of Hypothesis

For calculating μ, the formula is $$\mu = \frac{2n1n2}{n1+n2}$$

Where n1 is number of + signs and n2 is number of – signs

For calculating σ, the formula is $$\sqrt{\frac{2n1n2\,(2n1n2-n1n2)}{(n1+n2)^2(n1+n2-1)}}$$

1. ACNB

Observed Runs = 22

+ signs (n1) = 31

-signs (n2) = 20

μ = 24.314

σ = 3.367

Upper Limit = μ + 1.28 σ

= 24.314 + 1.28 * 3.367 = 28.624
Lower Limit = μ-1.28 σ
= 24.314 - 1.28 * 3.367 = 20.004
Observed runs are in between Upper Limit and Lower Limit

2. AMNB
Observed Runs = 28
+ signs (n1) = 25
-signs (n2) = 26
μ = 25.490
σ = 3.533
Upper Limit = μ + 1.28 σ
= 25.490 + 1.28 * 3.533 = 30.012
Lower Limit = μ-1.28 σ
= 25.490 - 1.28 * 3.533 = 20.968
Observed runs are between lower limit and upper limit.

3. BANF
Observed Runs = 22
+ signs (n1) = 26
-signs (n2) = 25
μ = 25.490
σ = 3.533
Upper Limit = μ + 1.28 σ
= 25.490 + 1.28 * 3.533 = 30.012
Lower Limit = μ-1.28 σ
= 25.490 - 1.28 * 3.533 = 20.968
Observed runs are between Lower Limit and Upper Limit.

4. CBNJ
Observed Runs = 27
+ signs (n1) = 24
-signs (n2) = 27
μ = 25.412
σ = 3.522
Upper Limit = μ + 1.28 σ
= 25.412 + 1.28 * 3.522 = 29.920
Lower Limit = μ - 1.28 σ
= 25.412 - 1.28 * 3.522 = 20.903
Observed runs are between lower limit and upper limit.

5. CFNB
Observed Runs = 27
+ signs (n1) = 24
-signs (n2) = 27
μ = 25.412
σ = 3.522
Upper Limit = μ + 1.28 σ
= 25.412 + 1.28 * 3.522 = 29.920
Lower Limit = μ - 1.28 σ
= 25.412 - 1.28 * 3.522 = 20.903
Observed runs are between lower limit and upper limit.

6. CCBG
Observed Runs = 28
+ signs (n1) = 23
-signs (n2) = 28
μ = 25.255
σ = 3.50
Upper Limit = μ + 1.28 σ

= 25.255 + 1.28 * 3.50 = 29.735
Lower Limit = μ - 1.28 σ
= 25.255 - 1.28 * 3.50 = 20.775
Observed runs are in between Upper Limit and Lower Limit

7. EVBS
Observed Runs = 27
+ signs (n1) = 23
-signs (n2) = 28
μ = 25.255
σ = 3.50
Upper Limit = μ + 1.28 σ
= 25.255 + 1.28 * 3.50 = 29.735
Lower Limit = μ - 1.28 σ
= 25.255 - 1.28 * 3.50 = 20.775
Observed runs are in between Upper Limit and Lower Limit

8. FBSS
Observed Runs = 33
+ signs (n1) = 25
-signs (n2) = 26
μ = 25.490
σ = 3.533
Upper Limit = μ + 1.28 σ
= 25.490 + 1.28 * 3.533 = 30.012
Lower Limit = μ-1.28 σ
= 25.490 - 1.28 * 3.533 = 20.968
Observed runs are above the Upper Limit.

9. GABC
Observed Runs = 28
+ signs (n1) = 24
-signs (n2) = 27
μ = 25.412
σ = 3.522
Upper Limit = μ + 1.28 σ
= 25.412 + 1.28 * 3.522 = 29.920
Lower Limit = μ - 1.28 σ
= 25.412 - 1.28 * 3.522 = 20.903
Observed runs are between lower limit and upper limit.

II. Conclusion

From 9 bank stocks, 8 bank companies falls between Upper Limit and Lower Limit and one stock fall above the upper limit. Hence, we accept the Null Hypothesis. Therefore, U.S. banking sector is efficient in Weak form.

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