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Weak Form of Efficiency in Nepal Stock Exchange

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Abstract

Weak form of market eficiency asserts that historical stock price movements are already reflected in the current stock prices. Hence, historical stock prices do not have predictive power to estimate future stock prices. Due to contradictory empirical evidences, there is a need to re-explore the weak form of market eficiency. Market indices were selected by using judgmental sampling design covering the study period from 1st July 2020 to 28th April 2025. Based on descriptive and analytical research design, Jarque-Bera test, Kolmogor6ov-Smirnov test, Run test, Variance Ratio test, Augmented Dickey Fuller test and Phillips Perron test were used on daily and weekly returns of NEPSE and 12 sectoral indices to examine distribution patterns, random walk and stationarity. It was found that the daily returns series did not exhibit market eficiency while weekly returns exhibited mixed results. Hence, it is concluded that Nepalese stock market is not eficient in weak form on a daily basis. The findings of this study have immense implications for investors, academicians and regulatory authorities. Future researches can be conducted to explore semi-strong and strong form of market eficiency.

Keywords**:** *Weak form of Market Eficiency, Eficient Market Hypothesis, Random Walk Theory, Nepalese Stock Exchange*

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Introduction

Efficient Market Hypothesis (EMH) has been the most controversial issues in the finance literature. Fama (1970) defined EMH, in his landmark paper, as the market in which stock prices already reflect all the historical, public and private information. Hence, stock prices respond quickly and accurately only to the release of fresh information. Similarly, EMH asserts that stock prices are, on an average, always stay at their intrinsic value. Hence, it is technically impossible to buy undervalued stock and sell overvalued stock. None can achieve the above-average returns than market even with the access of historical, public or private information. There is no room for speculation, technical and fundamental analysis because any past information is already reflected in the stock price. Hence, the simplest and the most rational way of investing is buy-and-hold (passive investment) strategy.

Fama (1970) classified market efficiency into three forms – weak form, semi-strong form and strong form. Weak form of EMH, closely related to Random Walk theory, asserts that historical price movements are already reflected in the current stock prices making historical stock prices and technical analysis irrelevant to predict future stock prices. Similarly, semi-strong form of market efficiency asserts that any publicly available information is already reflected in the current stock prices making publicly available information and fundamental analysis irrelevant to predict future stock prices. Finally, strong form of market efficiency asserts that private information is also already reflected in the current stock prices making insider trading irrelevant to predict future stock prices.

It is relevant to examine the weak form of EMH due to various reasons. First, investors become confident in efficient market in the sense that they always make informed and rational decisions and they receive a risk-adjusted rate of return on investment (Malkiel, 2003) which boosts investors' confidence. Second, weak form of EMH advocates that technical analysis is completely useless to predict the future prices (Malkiel, 2003). In other hand, supporters of technical analysis strongly disagree with EMH. This contradiction gave motivation to examine the validity of weak form of EMH. Third, EMH has solid theoretical foundation and the origin for many other financial theories. Yet, its empirical validity is not so much promising. The result of empirical studies examining EMH is mixed (Khanal et al., 2025; Bonga et al., 2024; Asaad & Omer, 2024; Adhikari & Karki, 2022). These evidences assert that EMH is the most controversial research topic in finance literature. With all these reasons, this study is an attempt to examine whether Nepal Stock Exchange (NEPSE) the only secondary capital market in Nepal, is efficient or not in weak form.

Most of the researches were conducted with data before COVID-19 era. After COVID-19, Nepalese economy witnessed significant change in various dimensions of macro-economic conditions such as inflation rates, interest rates, liquidity in banking sector. Similarly, the Nepalese stock markets has undergone modernization as it has witnessed effective implementation of online trading, digital payment system, dramatic increase in transaction volume, market capitalization and market participants post COVID-19. Due to dramatic changes in both stock market and macro-economic conditions of the country, there is a need to re-explore the efficiency of Nepalese stock market after COVID-19.

Based on these premises, the study has set the general objective to test the weak-form efficiency of Nepal Stock Exchange (NEPSE) which is fragmented into three specific objectives which are: (a) to test the normality of the returns of NEPSE and its sectoral indices, (b) to investigate the presence of serial correlation of the returns of NEPSE and its sectoral indices with its lagged values, and (c) to test the stationarity of the returns of NEPSE and its sectoral indices. To examine the weak form market efficiency of NEPSE, following hypotheses were formulated:

Hypothesis 1: Distribution patterns of stock returns of NEPSE
Alternative hypothesis, H_1: NEPSE and its sectoral returns do not follow a normal distribution.
Hypothesis 2: Serial (auto) correlation in stock returns of NEPSE
Alternative hypothesis, H_1: There is serial correlation between NEPSE and its sectoral indices with their lagged values.
Alternative hypothesis, H_1: Variance ratio is not equal to unity in the return series of NEPSE and its sectoral indices.
Hypothesis 3: Presence of unit root in stock returns series
Alternative hypothesis, H_1: There is no unit root in the return series of NEPSE and its sectoral indices.

Literature Review

Though, EMH has strong theoretical foundation and the basis for many other theories and models, its empirical evidences are controversial.

Some empirical studies rejected the validity of market efficiency. For instances, Asaad and Omer (2024) concluded that fourteen Arabian and North African stock markets were inefficient in the weak-form suggesting returns predictability. Similarly, Gaio (2022) explored that the stock markets of developed countries were also inefficient in the weak form during instability and financial crisis. Similarly, Bhatia (2022) found

the inefficiency of NIFTY and SENSEX of India during nationwide lockdown and suggested that stock market became more speculative and more fertile for abnormal profits during the crisis period. Dias et al. (2020) refuted the weak-form market efficiency both in developed and emerging markets as well as both in European and non-European countries.

However, some other studies accepted the weak form of EMH. Bonga et al. (2024) confirmed that Zimbabwe Stock Exchange (ZSE) followed a random walk during the pandemic period. Similarly, Ryaly et al. (2014) found the existence of weak form of market efficiency in the Asian stock markets such as South Korea, Hong Kong, Japan, Singapore and India. Similarly, Dangol (2011) showed that the Indian stock markets was efficient in the weak form.

Conversely, some other studies have mixed results regarding the validity of weak form of EMH (Hanna & Al-Qadi, 2024; Munir & Kok, 2024; Hawaldar et al., 2017; Nwachukwu & Shitta, 2015).

The studies conducted in the Nepalese stock markets are divided regarding its efficiency. For instance, various evidences showed that NEPSE did not exhibit weak-form efficiency (Khanal et al., 2025; Risal & Koju, 2021; Dhodary, 2020). However, Dangol (2012) reported contradictory results stating that NEPSE was efficient in weak form when data was adjusted for thin trading. These studies showed the contradictions in results which give scope for further research to test the validity of weak form of EMH.

Research Methodology

Research Design

Descriptive and analytical research design were used to test the weak form of EMH of NEPSE to test the normality, serial correlation and stationarity of the daily and weekly returns of NEPSE and its sectoral indices.

Sampling Design

Judgmental sampling design was implemented to select sample indices to test the weak form of EMH using following criteria:

(i) NEPSE was selected as it represents all forms and types of securities listed in Nepalese stock market.
(ii) Sub-indices such as sensitive, float and sensitive float were excluded from the study because it represents the sub-set of NEPSE and performance of sub-indices are already reflected in NEPSE.

(iii) However, sectoral indices were included to test the weak form of sectoral efficiency.
(iv) Mutual fund was excluded because mutual funds are institutional investors and inclusion of mutual fund index will have duplication effect in the study.

Population and Sample

NEPSE has four major indices namely NEPSE, Sensitive, Float and Sensitive Float. Similarly, there are 13 sectoral indices namely Commercial Bank, Development Bank, Finance, Microfinance, Life Insurance, Non-life Insurance, Hydropower, Manufacturing and Processing, Trading, Hotel and Tourism, Investment, Mutual Fund and Other. These 17 indices are defined as the population of the study. Among them, NEPSE and 12 sectoral indices were selected excluding Mutual fund.

Nature and Sources of Data

This study used time series data collected from secondary source to examine weak form of EMH.

Data Collection Techniques

NEPSE closed at 1246.2 on 22nd March 2020 after the government-imposed lockdown due to COVID-19 wave. After that, NEPSE resumed its regular trading from 29th June 2020. Since, this research is an attempt to explore weak form efficiency post COVID-19, the daily and weekly closing NEPSE and sectoral indices were collected after 1st July 2020 to 28th April 2025 from the official website of NEPSE. In this course, total 1141 daily indices and 251 weekly indices were obtained.

Data Analysis Techniques

The study used daily and weekly returns of NEPSE and its sectoral indices. The natural logarithm of the relative indices was computed in MS-Excel to produce a time series of continuously compounded returns which is expressed in model 1 as:

Where,

R_t represents daily/weekly returns in the logged terms
P_t represents the closing indices at time t
P_{t-1} represents the closing indices at time t-1
Ln refers to natural logarithm

Three different approaches were used to test the random-walk namely normality test, test for serial correlation and stationarity test.

Test for Normality of Stock Returns

The first condition to be fulfilled for market to be efficient is normality for which Jarque-Bera statistics and Kolmogorov-Smirnov test were used.

Jarque-Bera Statistics

Jarque-Bera (JB) test is a parametric statistical measure used to test normality. It measures whether the stock returns have the skewness and kurtosis in align with a normal distribution. Test statistic of JB test can be computed with the help of model 2.

Where,
n = sample size
S = skewness of return series
K = kurtosis of return series

One Sample Kolmogorov-Smirnov (K-S) test

One sample K-S test is a non-parametric statistical measure used to test normality. Test statistic of K-S test is computed in model 3.

Where,
r = Returns series
F(r) = Cumulative Distribution Function (CDF) of returns
F_n (r) = Empirical Cumulative Distribution Frequency (ECDF) of returns
D_n = Test statistic which is the maximum value of absolute difference between ECDF and CDF

Test for Serial Correlation of Stock Returns

The major condition of a weak form efficiency of market is the absence of serial correlation. Auto-correlation is the time series relationship of current stock returns with its lag values. Run test and variance ratio test are used to test the presence of serial correlation.

Run test

Run test is a non-parametric statistical measure to test the serial correlation. It is measured using models 4, 5 and 6.

Where,
= number of positive runs
= number of negative runs
n = total number of observations =
R = number of runs

Variance ratio test

Variance Ratio (VR) test is a parametric statistic used to test the serial correlation in stock returns. Test statistic of VR is measured using model 7 and 8.

Where,

q = holding period (number of lags)

Test for Stationarity of Stock Returns

A stationary stock return series is referred to that series which have a constant mean, variance, and autocovariance over time. Stationary stock returns assure a random fluctuation of stock returns around a constant mean.

Augmented Dickey Fuller (ADF) test

Augmented Dickey-Fuller (ADF) test is used to determine whether a time series has a unit root or not. Unit root can be defined as a time series which is depended in its lag (past) values.
Augmented Dickey Fuller (ADF) test can be conducted using the model 9.

Where,

α = constant
β_t = time trend
p = number of lagged difference terms

Philips Perron (PP) test

Philips Perron test is a non-parametric statistic used to test the stationarity of returns series. Statistics of Philips Perron (PP) test is measured by model 10.

Results

This section deals with normality, serial correlation and stationarity of returns.

Test Result of Hypothesis 1: Distribution Patterns of Stock Returns

The first conditions of the stock returns to be efficient in weak form of efficiency in Stock Exchange is its normal distribution. Hence, hypothesis 1 of distribution patterns of stock returns was tested using parametric test i.e. Jacque-Bera test and non-parametric test i.e. Kolmogorov-Smirnov (K-S) test. The data is presented in table 1, 2 and 3.

Table 1

Descriptive Statistics and Normality test for daily NEPSE and sectoral returns

Indices	N	Mean	SD	Min.	Max.	S	K	JB	P-value
NEPSE	1140	0.07	1.47	-6.21	5.87	0.39	4.87	194.60	.00
Commercial Banks	1140	0.02	1.43	-7.72	9.44	1.12	8.63	1745.91	.00
Development Banks	1140	0.11	2.17	-7.56	9.46	0.71	4.65	224.64	.00
Finance	1140	0.12	2.51	-8.95	9.30	0.50	4.23	120.04	.00
Micro Finance	1139	0.08	1.71	-10.03	8.58	0.60	6.31	588.88	.00
Life Insurance	1140	0.06	1.82	-8.62	9.30	0.75	6.19	590.23	.00
Non-Life Insurance	1140	0.08	1.74	-5.91	7.89	0.59	4.43	162.94	.00
Hydropower	1140	0.12	2.20	-7.06	8.89	0.52	4.13	111.38	.00
Manufacturing	1140	0.09	1.78	-7.86	7.38	0.76	4.81	265.33	.00
Trading	1137	0.15	2.55	-9.94	9.52	0.95	5.92	573.35	.00
Hotels and Tourism	1139	0.13	2.18	-9.09	10.24	0.77	5.18	336.57	.00
Investment	976	0.02	1.82	-6.59	8.49	0.67	4.97	230.77	.00
Others	1140	0.11	1.95	-9.57	8.07	0.50	4.98	233.32	.00

Table 1 shows descriptive statistics and normality test for daily NEPSE and sectoral returns for the period from July 1, 2020 to April 28, 2025. Descriptive statistics include number of observations (N), mean, standard deviation (SD), minimum and maximum values. Normality tests include Skewness (S), Kurtosis (K), Jarque-Bera (JB) test and its asymptotic probability. The table shows that coefficient of skewness of NEPSE and all sectoral indices are greater than zero indicating positive skewness. Similarly, the coefficient of Kurtosis of NEPSE and all sectoral indices are greater than three indicating leptokurtic distribution. Presence of positive skewness and leptokurtic distribution violated the norms of normality distribution. Furthermore, JB test shows that the null hypothesis of normality of daily returns of NEPSE and all sectoral indices are rejected ($p<.05$). All of the results show that the daily returns of

Nepalese stock market do not follow the normal distribution which violates the norms of weak form of EMH.

Table 2

Indices	N	Mean	SD	Min.	Max.	S	K	JB	P- Value
NEPSE	249	0.30	3.25	-7.86	9.50	0.26	2.85	3.04	0.22
Commercial Banks	249	0.08	3.22	-9.32	13.09	0.89	5.09	78.45	0.00
Development Banks	249	0.47	4.59	-9.81	16.04	0.59	3.82	20.93	0.00
Finance	249	0.54	5.87	-16.71	22.33	0.72	4.60	48.39	0.00
Micro Finance	249	0.32	3.97	-13.78	11.27	0.43	3.39	9.17	0.01
Life Insurance	249	0.23	3.96	-9.06	13.90	0.56	3.75	18.82	0.00
Non-Life Insurance	249	0.32	3.86	-10.53	13.27	0.42	3.52	10.09	0.01
Hydropower	249	0.53	4.73	-10.92	15.85	0.63	3.78	22.87	0.00
Manufacturing	249	-0.01	1.44	-5.71	4.83	-0.55	4.31	30.32	0.00
Trading	249	0.65	6.23	-16.31	39.17	2.03	10.57	766.13	0.00
Hotels and Tourism	249	0.63	4.97	-10.68	23.16	1.31	6.01	165.03	0.00
Investment	214	0.07	4.15	-9.68	17.54	0.93	4.99	66.18	0.00
Others	249	0.50	4.30	-8.75	17.09	0.89	4.68	62.75	0.00

Descriptive Statistics and Normality test for weekly NEPSE and sectoral returns

Table 2 shows descriptive statistics and normality test for weekly NEPSE and sectoral returns for the period from July 1, 2020 to April 28, 2025. Descriptive statistics includes number of observations (N), mean, standard deviation (SD), minimum and maximum values. Normality tests include Skewness (S), Kurtosis (K), Jarque-Bera (JB) test and its asymptotic probability. The table shows that the coefficient of skewness of NEPSE and 11 sectoral indices are greater than zero indicating positive skewness except manufacturing and processing sector whose coefficient is less than zero indicating negative skewness. Similarly, the coefficient of kurtosis of NEPSE is less than three indicating the platykurtic distribution. In contrast, the coefficient of all sectoral indices is greater than three indicating leptokurtic distribution. Furthermore, JB test shows that the null hypothesis of normality of weekly returns of NEPSE is failed to rejected ($p>.05$) while, it is rejected in sectoral indices ($p<.05$). The results show that the Nepalese stock market is efficient but sectoral indices are not efficient in weak form.

Table 3

One-sample K-S test of daily and weekly returns of NEPSE and sectoral indices

	Daily Returns		Weekly Returns	
Indices	**Test Statistics**	**P-Value**	**Test Statistics**	**P-Value**
NEPSE	.07	.00	.05	.20
Commercial Banks	.11	.00	.07	.00
Development Banks	.08	.00	.07	.00
Finance	.07	.00	.07	.00
Micro Finance	.08	.00	.07	.01
Life Insurance	.09	.00	.06	.02
Non-Life Insurance	.09	.00	.05	.20
Hydropower	.06	.00	.09	.00
Manufacturing	.08	.00	.09	.00
Trading	.12	.00	.14	.00
Hotels and Tourism	.09	.00	.11	.00
Investment	.08	.00	.07	.01
Others	.08	.00	.08	.00

Table 3 shows test statistics and asymptotic probability of Kolmogorov-Smirnov (K-S) test for daily and weekly NEPSE and sectoral returns for the period from July 1, 2020 to April 28, 2025.

The null hypothesis of normality for daily returns is rejected ($p<.05$) which shows that the daily stock returns are not normal and does not support weak form of efficiency. However, the null hypothesis of normality for weekly returns is failed to reject in NEPSE and non-life insurance sector ($p>.05$) which show normal distribution and supports weak form of efficiency. The null hypothesis of normality for weekly returns in other sectors are rejected ($p<.05$) which does not show normal distribution and hence, it rejects weak form of efficiency.

Test Result of Hypothesis 2: Serial Correlation in Stock Returns

Auto-correlation is the relationship of a time series data with its lag values. Hence, the foremost condition of weak form of EMH is the absence of serial (auto) correlation. To test the presence of serial correlation in return series, non-parametric test such as Run test and parametric test such as Variance Ratio (VR) test are used.

Table 4

Run test for daily and weekly NEPSE and sectoral returns

Indices	Daily Returns				Weekly Returns			
	Test Value	No. of Runs	Z	P-Value	Test Value	No. of Runs	Z	P-Value
NEPSE	-0.03	490.00	-4.80	0.00	0.13	110	-1.97	0.05
Commercial Banks	-0.19	500.00	-4.21	0.00	-0.37	120	-0.70	0.49
Development Banks	-0.18	536.00	-2.07	0.04	-0.20	120	-0.70	0.49
Finance	-0.11	533.00	-2.25	0.02	-0.02	109	-2.10	0.04
Micro Finance	-0.12	490.00	-4.77	0.00	-0.24	114	-1.46	0.14
Life Insurance	-0.17	517.00	-3.20	0.00	-0.12	112	-1.71	0.09
Non-Life Insurance	-0.13	527.00	-2.61	0.01	0.02	120	-0.70	0.49
Hydropower	-0.12	496.00	-4.45	0.00	0.16	125	-0.06	0.95
Manufacturing	-0.10	542.00	-1.72	0.09	0.14	112	-1.71	0.09
Trading	-0.15	555.00	-0.86	0.39	-0.44	132	0.83	0.41
Hotels and Tourism	-0.18	569.00	-0.09	0.93	-0.22	129	0.45	0.66
Investment	-0.19	440.00	-3.14	0.00	-0.41	106	-0.27	0.78
Others	-0.08	522.00	-2.90	0.00	0.03	112	-1.71	0.09

The table shows test values, number of runs, z-statistics and asymptotic probability of Run test for daily and weekly NEPSE and sectoral returns for the period from July 1, 2020 to April 28, 2025. It was found that the null hypothesis of absence of serial correlation is rejected in the daily returns of NEPSE and sectoral indices except manufacturing, trading and hotels and tourism ($p<.05$) indicating the presence of serial correlation. However, the situation is different in weekly returns. The null hypothesis of absence of serial correlation is failed to reject in the weekly returns of NEPSE and sectoral indices except finance sector ($p>.05$). It shows that weekly returns of NEPSE and sectoral indices except finance sector show random behaviour.

Table 5

Variance Ratio (VR) test for daily and weekly NEPSE and sectoral returns

Indices	Daily Returns				Weekly Returns			
	Lag	VR		P-value	Lag	VR		P-value
NEPSE	2	0.56	8.73	0.00	2	0.50	6.13	0.00
	8	0.13	7.45	0.00	8	0.14	4.06	0.00
	16	0.07	5.91	0.00	16	0.08	3.02	0.00
Commercial Banks	2	0.61	6.95	0.00	2	0.48	5.3	0.00
	8	0.14	6.71	0.00	8	0.12	3.60	0.00
	16	0.07	5.32	0.00	16	0.07	2.78	0.01
Development Banks	2	0.58	9.38	0.00	2	0.53	5.60	0.00
	8	0.14	7.51	0.00	8	0.14	3.72	0.00
	16	0.07	5.67	0.00	16	0.08	2.78	0.01
Finance	2	0.61	9.29	0.00	2	0.49	5.74	0.00
	8	0.14	7.92	0.00	8	0.14	3.69	0.00
	16	0.07	5.96	0.00	16	0.07	2.80	0.01
Micro Finance	2	0.61	7.64	0.00	2	0.48	5.52	0.00
	8	0.15	7.02	0.00	8	0.14	3.64	0.00
	16	0.07	5.63	0.00	16	0.07	2.91	0.00
Life Insurance	2	0.49	5.19	0.00	2	0.49	5.19	0.00
	8	0.15	3.55	0.00	8	0.15	3.55	0.00
	16	0.08	2.82	0.00	16	0.08	2.82	0.00
Non-Life Insurance	2	0.49	5.62	0.00	2	0.49	5.62	0.00
	8	0.14	3.73	0.00	8	0.14	3.73	0.00
	16	0.08	2.84	0.00	16	0.08	2.84	0.00
Hydropower	2	0.49	5.9	0.00	2	0.49	5.90	0.00
	8	0.14	3.88	0.00	8	0.14	3.88	0.00
	16	0.08	2.92	0.00	16	0.08	2.92	0.00
Manufacturing	2	0.61	4.68	0.00	2	0.61	4.68	0.00
	8	0.14	3.94	0.00	8	0.14	3.94	0.00
	16	0.08	2.95	0.00	16	0.08	2.95	0.00
Trading	2	0.59	3.97	0.00	2	0.59	3.97	0.00
	8	0.15	3.12	0.00	8	0.15	3.12	0.00
	16	0.08	2.46	0.01	16	0.08	2.46	0.01
Hotels and Tourism	2	0.45	5.26	0.00	2	0.45	5.26	0.00
	8	0.13	3.67	0.00	8	0.13	3.68	0.00
	16	0.07	2.88	0.00	16	0.07	2.88	0.00
Investment	2	0.53	4.86	0.00	2	0.53	4.86	0.00
	8	0.16	3.42	0.00	8	0.16	3.42	0.00
	16	0.09	2.69	0.00	16	0.09	2.69	0.00

Others	2	0.53	4.79	0.00	2	0.53	4.79	0.00
	8	0.15	3.42	0.00	8	0.15	3.42	0.00
	16	0.08	2.69	0.01	16	0.08	2.69	0.00

Table 5 demonstrates the coefficient of Variance Ratio test, absolute value of Z-Statistics and asymptotic probability at lag 2, 8 and 16 for daily and weekly returns of NEPSE and sectoral indices. The result indicates that the null hypothesis of random walk of Variance Ratio test for both daily and weekly returns of NEPSE and its sectoral returns is rejected in all cases ($p<0.05$). It indicates that there is the presence of serial correlation in daily and weekly returns of NEPSE and sectoral indices which rejects the weak form of market efficiency and random walk behaviour.

Test Result of Hypothesis 3: Stationarity of Stock Returns

The last condition of the stock returns to be efficient in weak form is its stationarity. Stationary stock returns assure that there are no systematic patterns in the long run. Hence, hypothesis 3 of stationarity of daily and weekly returns of NEPSE and its sectoral indices are tested using Augmented Dickey Fuller (ADF) test as a parametric test and Phillips Perron (PP) test as a non-parametric test.

Table 6

Indices	Augmented Dickey-Fuller (ADF)				Phillips-Perron (PP)			
	Daily Returns		Weekly Returns		Daily Returns		Weekly Returns	
	t	P-value	t	P-value	t	P-value	t	P-value
NEPSE	-17.79	0.00	-17.79	0.00	-31.89	0.00	-14.22	0.00
Com. Banks	-29.61	0.00	-29.61	0.00	-29.53	0.00	-15.19	0.00
Dev. Banks	18.82	0.00	-18.92	0.00	-32.78	0.00	-14.66	0.00
Finance	-18.09	0.00	-18.09	0.00	-30.02	0.00	-14.91	0.00
Micro Finance	-29.98	0.00	-29.98	0.00	-29.94	0.00	-15.49	0.00
Life Insurance	-30.31	0.00	-30.21	0.00	-30.46	0.00	-13.49	0.00
Non-Life Ins.	-30.08	0.00	-30.08	0.00	-30.31	0.00	-14.04	0.00
Hydropower	-18.61	0.00	-18.61	0.00	-31.14	0.00	-14.47	0.00
Manufacturing	-17.13	0.00	-17.13	0.00	-30.69	0.00	-13.77	0.00
Trading	-28.65	0.00	-28.65	0.00	-29.32	0.00	-13.09	0.00
Hotels & Tour.	-33.09	0.00	-33.09	0.00	-33.25	0.00	-14.69	0.00
Investment	-16.62	0.00	-16.62	0.00	-28.42	0.00	-13.27	0.00
Others	-18.02	0.00	-18.02	0.00	-31.27	0.00	-14.03	0.00

Augmented Dickey- Fuller (ADF) test and Phillips-Perron (PP) test of daily and weekly returns of NEPSE and its sectoral returns

Table 6 demonstrates t-statistics and asymptotic probability of Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test of daily and weekly returns of NEPSE and its sectoral returns.

Both Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test suggested that daily and weekly NEPSE and sectoral returns do not have a unit root and are stationary ($p<.01$). The third condition of random walk is clearly supported by both parametric and non-parametric tests.

Discussion

This study reveals significant understandings into the weak form of efficiency of the NEPSE. Run test and Variance ratio test of daily NEPSE and sectoral returns suggests that past price movement have the predictive tool to estimate future stock price movements. The findings are consistent with (Asaad & Omer, 2024; Gaio, 2022; Bhatia, 2022; Dias et al., 2020). The presence of returns predictability challenges the concept of a random walk in the daily price series.

Conversely, the mixed results from the analysis of weekly NEPSE and sectoral returns suggest a more complex picture. Some statistical tests such as Run test have accepted the randomness, other tests such as Variance Ratio indicate the presence serial correlations. These findings are consistent with (Khanal et al., 2025; Hanna & Al-Qadi, 2024; Munir & Kok, 2024; Risal & Koju, 2021; Dhodary, 2020; Hawaldar et al., 2017; Nwachukwu & Shitta, 2015). This ambiguity in results indicates that the market behavior over a slightly longer horizon may be closer to efficiency, or at least less predictable, compared to daily return series.

Furthermore, the inefficiencies detected in daily return series could also stem from the dominance of retail investors, lack of diversity in trading products and options, regulatory incompetence, and lack of accurate and prompt dissemination of information. These factors hinder the incorporation of publicly available information into stock prices, thereby violating the weak form of EMH in developing countries.

Conclusion

This study aimed to examine the weak form of market efficiency in NEPSE using daily and weekly returns series. It was found that both Jarque-Bera test and Kolmogorov-Smirnov test clearly rejected the normality of daily NEPSE and sectoral returns, while the results are mixed in weekly returns. Run test shows the presence of serial correlation in daily NEPSE and sectoral returns with few exceptions which indicates the violation of weak form of market efficiency on daily basis. In contrast,

Run test suggested that the weekly NEPSE and its sectoral returns have no serial correlation. However, Variance Ratio test suggested that there is the presence of serial correlation both in daily and weekly NEPSE and its sectoral returns. However, both Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test suggested that both daily and weekly NEPSE and its sectoral returns are stationery. The findings provide clear evidence that NEPSE is not efficient in the weak form in the context of daily returns, suggesting that prices do not follow a random walk and are predictable. However, the analysis of weekly NEPSE and sectoral returns yields mixed results, indicating that while the market may demonstrate some degree of efficiency over a longer interval, it does not fully confirm to the weak form of EMH.

These findings have important implications for investors/traders, regulatory authorities and academicians. For investors/traders, the market inefficiency in daily returns may provide short-term trading opportunities. For regulatory authorities, the findings of the study highlight the need to improve technological infrastructure, market transparency and investor education to enhance the efficiency of the market. For academicians, this study contributes to address the existing dispute about the presence of market efficiency. Future researchers can examine whether the Nepalese stock market is efficient in semi-strong or strong forms. Weak form of market efficiency can also be tested at international markets.

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