

# Random Walk of Security Prices: Empirical Evidence from KSE, LSE, and ISE

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**Abstract:** *Previously security market research has been focused mainly on developed economies with no attention paid to the security markets of developing countries of South East Asia. In an attempt to fill this gap in the literature, this paper conducts an empirical investigation of the random walk of security prices in Pakistani stock markets. The Augmented Dickey fuller test, Ljung Box Q test, Variance ratio test and a non parametric Run test has been used for analysis of Random walk of security prices. Results indicate the presence of some predictable elements, which contradict with previous studies on Karachi stock market. This is because of the difference in number of observation used in previous studies and this particular study. To conclude, the Karachi stock exchange and Islamabad stock exchange does show a weak random walk of security prices, while Lahore stock exchange show strong random walk of security prices.*

**Keywords:** *Random Walk of Security Prices, Efficient Market hypothesis, ADF, Run Test, Variance ratio test, Ljung Box Q-statistics.*

## 1. INTRODUCTION

The behavior of security prices is one of the affluently documented works in empirical finance; the most enduring model used for this purpose is the random walk hypothesis. The Random Walk Hypothesis has an illustrious history, with remarkable intellectual forbears such as Bachelier, Einstein, L'evy, Kolmogorov, and Wiener. Reference [1] gives first contribution to literature by using random walk hypothesis for financial markets. It was firmly believed amongst financial empiricists that stock market price should reflect the intrinsic value of underlying assets. Over the past two decades ample research work has been undertaken to test the efficient market hypothesis – the claim that a market in which prices fully reflects available information is an efficient one. It was strongly argued that there were no opportunities for investors to make abnormal profits by exploiting information contained in the history of fundamental market data. Reference [2] categorizes three forms of market efficiency: weak, semi-strong and strong. These three forms differ in terms of the types of information which are used in developing investment strategies. As [3] points out, a sufficient condition for weak-form efficiency is that the stock prices fluctuate randomly. As a result; a market is efficient in the weak form if stock prices follow a random walk process.

Investors in weak-form efficient markets cannot expect to find any patterns in the historical sequence of stock prices that would provide insight into future price movements and allow them to earn an abnormal rate of return. The security prices fluctuate randomly if a market is efficient, and the degree of randomness of security prices increases with an increase in market efficiency. The most efficient market of all is one in which price changes are completely random and unpredictable. For these reasons, the Random Walk Hypothesis and its close relative, the Efficient Markets Hypothesis, have become icons of modern financial economics that continue to fuel the imagination of academics and investment professionals alike.

Augmented Dickey Fuller Unit Root Test and Serially Un-Correlation Method have been used for the detection of random walk in time series data, see, among others [4], [5], [6] and [7]. Reference [8] shows that common stock prices have properties analogous to the movement of molecules. Osborne applies the methods of statistical mechanics to the stock market, with a detailed analysis of stock price fluctuations from the point of view of a physicist.

Many research works on stock behavior suggest that the expected value of speculative strategies should be zero. In an efficient market the stock prices would reflect all the available information and as a result of different favorable and unfavorable news the stock prices varies differently. These different variations are termed as random movement and in econometric terminology it is called random walk of security prices.

The purpose of this paper is to investigate evidence in support of random walk hypothesis in the Pakistani stock markets (LSE, ISE and KSE) using three techniques: the run test, Augmented Dickey fuller test for unit root, Variance ratio test and Ljung–Box Q test. Of the four tests used, three examine inter temporal structure of stock returns and one examines unit root stationarity in the price revelation process. As [9] points out, if the evidence fails to support weak-form tests there is no reason to examine semi-strong (and/or strong) forms before declaring the market is inefficient on the evidence.

The significance of random walk hypothesis: The significance of the random walk theory can be explained both practically and theoretically. From practical point of view canvasser of the hypothesis deals with the absence or presence of systematic elements in their empirical studies, and the detection of some nonrandom components is not evidence against the RWH unless it can be shown that

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