FORECASTING SECURITY PRICES USING TECHNICAL ANALYSIS: EVIDENCE FROM NIGERIA

ONOME OMENA AKUNOMA
Department of Accountancy, Federal Polytechnic, Orogun, Nigeria
akunomaonome@gmail.com
MONDAY OSAYANDE
Michael and Cecilia Ibru University, Agbarha-Otor, Nigeria
osayandemonday26@gmail.com

Abstract

Technical analysis is a critical part of investment decision making of an investor that helps in predicting future share prices, in terms of the formulation of buy-hold- sell decisions. The technique relies on price movement of a security and uses this data to predict its future price movements. This paper utilized technical analysis for eight major sectors, consisting of agriculture, conglomerates, construction and real estate, consumer goods, financial services, health care, industrial goods, oil and gas to examine the average price movement of stocks. It further obtained forecasts estimates of their expected prices of the securities over a three-month span (first quarter of 2022), disintegrated into 10-day-ahead forecasts interval. The results show in general, that firm with progressive average stock performance and lower risk (variability) are more appealing to investors and that it is optimal to sell stocks when prices are high and buy when prices are low.

Keywords: Technical analysis, Return volatility, Historical Price, Asset Portfolio returns.

JEL Classification: G12, G14, G15.

1. INTRODUCTION

Forecasting the dynamics of prices/values of securities has become a topical issue in behavioural finance over the last decade. Against the backdrop of the fact that the stock market activities are usually characterizing by considerable degree of uncertainty and risk, arising from the interplay of internal market dynamics and exogenous forces, empirical emphasis has focused on predicting price movement of securities. In achieving this, the utilization of technical analysis has become handy. Technical analysis is an integral aspect of financial market technique that claims the ability to forecast the future direction of stock through the use and study of past market data, price movement patterns, price, and volume correlation (Venu, Vikas & Charithra, 2019).

The onus on forecasting of securities' prices in the stock market has also been fueled by the existence of structural imperfections that tend to inhibit the normal and free flow of market information, thereby generating distortions in the investment process. Investment decisions by investors are influenced based on fundamental and technical analysis. Technical analysis as a part of investment decision making of an investor helps to predict the future share prices, which can help in formulating buy-hold- sell decisions. It helps in identifying trend reversals at an earlier stage to formulate the buy or sell strategy. It relies on price movement of security and uses this data to predict its future price movements (Demers, 2021). Apart from being able to forecast prices of securities in the market, technical analysis has the capacity to generate the optimal or equilibrium growth path of equities, in the face of distorting market forces.

In trying to predict the future price or return of an asset on the basis of the risk associated with optimal investment decisions, there is greater need to deploy efficient empirical tools. It is in this regard that technical analysis becomes important. To determine the stocks to invest in, for instance, a rational investor needs to pay due attention to the risks involved in investing in such stocks pays the true value of the asset. Security analysis of stocks also helps in the evaluation of different resources in a portfolio and aides in finding the reason impacting the variances in the present market on evaluation of the securities (Pushpa, Sumithra & Hegde, 2017). Technical analysis in itself is not the most suitable method for long-term investment but useful for determining the optimal price for buying or selling over a shorter period of time and using a momentum-based approach.

While considerable part of the empirical literature on security price determination has tended to focus on the fundamental aspect, there is however, scarcity of literature on the use of technical analysis in understanding the dynamics of securities in developing countries, particularly Nigeria. Added to this fact is the utilization of various tools of technical analysis, which has generated mixed findings on the prediction of prices of securities. For a country like Nigeria, with a highly risky and uncertain environment, forecasting the price movement of securities is highly important to efficient and optimal investment decisions. It is the recognition of the aforementioned gaps in literature, as well as the importance of stock analysis to good investment decision-making that warrants this study.

STATEMENT OF THE RESEARCH PROBLEM

Against the background of the reality of an uncertain investment environment that characterizes the economy of developing countries, particularly Nigeria, the making of optimal investment decision with respect to the valuation of securities, given the overwhelming influence of the macroeconomic environment (i.e., exogenous influences) becomes sacrosanct. Behavioural finance has already shown that rational and forward-looking economic agents are highly risk averse. Predicting stock movements is therefore problematic particularly when markets are highly volatile and cyclical. Investors are required to make the entry and exit

strategies in order to make profits or avoid losses. A rational investor should base his interpretation and investment decisions on both fundamental and technical analysis. Nevertheless, technical indicators play more pronounced role in predicting stock movements and also determining entry and exit points. Furthermore, stock prices move in trends and cycles that are never stable (Pushpa et al., 2017).

With the growing number of huge losses suffered in the investment environment due to a number of impinging factors, there is need to regularly monitor past market data and prices and deploying these, in addition to past price movement patterns, and volume correlation to forecasting future price direction of stocks. Hence, this is imperative in order to use technical indicators to forecast investors on buy-hold and sell strategies by looking at the price movement in securities.

Aside from this subsection, the remainder of this work is structured as follows. Section 2 considers the related literature on security valuation using technical analysis. Section 3 contains the methodology. The results and discussion are presented in section 4 and section 5 concludes the paper, with some evidence-based policy perspectives.

2. LITERATURE REVIEW

2.1. CONCEPTUAL CLARIFICATION

Technical analysis provides information based on weak form market efficiency as it depends mostly on past price history and is based on the assumptions that stock price reflects all information that could affect a company, price move in trends and history repeats . Technical analysis is an estimating system to decide the future value developments in sight of the previous recorded information. Investors can anticipate the changes in prices over time used by traders, market makers, and financial analysts through technical analysis. It is a tool through which investors can anticipate the changes in prices over time, and it is used by traders, market makers, as well as financial analysts (Pushpa et al, 2017).

Technical analysis indicators are price, value, volume and so on to decide the entry, hold and exit time and levels. Charts represent few activities to predict the changes in the shares of a company. It is a technique that claims the ability to forecast the future direction of prices through the study of past market data. The strength of analysis depends on how accurately the price movements are predicted ((Pushpa et al., 2017). The main advantage of technical analysis is that it enables the buy- and-hold average return of stocks, by placing importance on herd psychology (the market) than on the valuation of securities of a publicly traded company. Technical analysis ignores fundamental data and focuses attention on fluctuations in the share price, as well as on trading volume.

With technical analysis, psychological price levels at which many investors decide to buy or sell can be identified. For instance, traders may place emphasis on all-time high, because the share prices have never risen higher. Following this logic,

investor perception may be influenced by observation of past data. Bullish and bearish indices or trends are phases of momentum that are generated by the general investor mood toward a company or industry. In other words, a strong rise or index in the share price, accompanied by a lower risk (volatility) is often a reflection of a sense of optimism and excitement on the part of the market. Conversely, a stock with downward trend or index reflects a pessimistic perception and puts pressure on sellers. All these are important and useful for investing approach ((Demers, 2021).

2.2. THEORETICAL LITERATURE

EFFICIENT MARKET HYPOTHESIS (EMH)

The literature on stock market efficiency, as it pertains to efficient market hypothesis (EMH) particularly (Fama, 1970; Fama, 1991) defines an efficient market as one in which asset (securities) prices (quickly) and fully reflect all available information. Reviewing the notion of Efficient Market Hypothesis (EMH), Fama (1970), suggests the importance of empirical investigation in to issues of market efficiency as it is critical to the understanding of the response of stock prices/returns/volatility to available information. Fama (1970) categorized the nature of market efficiency into three subsets: weak form efficiency, semi-strong form efficiency, and strong form efficiency. Weak form efficiency makes it impossible for investors to gain any extra profits using historical prices. In the weak form efficiency, investors believe that the market already reflects all historical information such as prices, trading volume, past financial statements, etc.

The market is said to be weak from efficient if market participant has access to all available market information and thus no opportunity for abnormal profits. Semi-strong efficient market prohibits the investors from gaining extra return by using available public information. Semi-strong form implies that no public information is particularly strange. Market participants would, therefore, not be able to earn abnormal returns by capitalizing on the existence of information asymmetry in the market, implying that current information is available to everyone. Hence, market prices already reflect all current available information. In the strong form of market efficiency, prices reflect all public and private (insider) information. This form of efficiency emphasizes the inability of investors to make higher profit even with earlier access to insider information.

2.3. EMPIRICAL LITERATURE

Menkhoff and Schlumberger (1997, cited in Pushpa et al, 2017) investigates the behavior of foreign exchange professionals, dealers, and fund managers in Germany in 1992. The results showed that, on average, 87% of the foreign exchange dealers and 35% of professionals use technical analysis in their decision making. About 34% of times, it was used for intraday decision making, and 40% for decisions ranging from 2 to 6 months. Other interesting findings are that there was no relationship between institutional size and the preferred use of technical analysis and

chartists and fundamentalists both indicated no significant differences in their educational level.

Neely and Weller (2002) forecasted the profitability of selected firms through trading in exchange rate market. To identify the probable profitability, he utilized the statistical tool to predict the issues regarding stock. He finds that growth in shares mirrors profitability. Aronson (2006) carried out a simple testing approach to determine the historical price of the industry and the strategy to adapt to in measuring their forecasting values. He concludes that emphasis should be based on unbiased price pattern and strategies to effectively forecast market prices.

Menkhoff and Taylor (2006) used technical analysis to predict foreign exchange and stocks in in India. They find positive returns for stocks. Lo, Mamaysky and Wang (2007) use empirical distribution, which has been used by different method based on conditional and non-conditional analysis over a period of 31 years. Utilizing technical pointer analysis, the results show that information about the specific value of stock can help to increase the profit.

Narwhal (2007) focused on both fundamental and technical analysis of the stock price and finds that the fundamental and technical analysis provides details about the sell and buy signal to calculate profitability decision in trade market. Suresh (2010) analyzed the different way of identifying stock, which are suitable for investment decision. He employed different type of analysis that can aid effective investment decisions. The results of the forecasting analysis show that the pattern and volume of investment, as well as the strategy of the investor to gain more returns, is connected to the historical price of stocks. Roberts (2010) finds evidence of the usefulness of technical analysis in stock market in Indian Asif-Ullah and Bhupesh (2011) used technical analysis to predict the optimal selection of stocks that are suitable for investment, given a complex risk environment. He concludes that investor seeks to identify the stock that has the potential to go up so that the investor can maximize returns on investment.

The study by Chitra (2011) finds that technical stock market techniques help to understand the value of share, which shows where the stocks is undervalued or overvalued. He concludes that invested will be able to analyze the turning point in stocks, and by extension, which stocks and stage to invest. Similarly, the study by Venkatesh and Tyagi (2011) is based on both technical and fundamental analysis to help investor predict the stock market in the future by forecasting the changes in the market based on future price movement. Ayyappan and Sakthivadivel, (2012) employ technical analysis to investigate the growth and trend of key profitability factors in Commercial Banks in Asia. The study also analyzed the development and movement of certain financial parameter of public and private bank sector. The results show upward growth in bank performance when macroeconomic environment improves.

Sudheer (2012) used technical analysis to forecast the price of securities, and in particular to decide when to enter and exit the security market. The results show

that bottom line represents buying signal, while high peak line represents selling, with considerable profit returns. The study by Varathan and Tamilenthi (2012) focused on the analysis of past present and future price of market condition through technical analysis. The study shows that future gain and losses effect are correlated with control on trading activities. This, according to the study, reduces the risk-associated with long-term investment which can lead to more profit and returns. Mishra (2012) used technical analysis to investigate the movement of stocks in India.

Naved (2012) employs analysis to evaluate the market nifty stock of India. Specifically, he explored the average movement of stocks in nifty market to determine their profit from trading. He utilizes Moving Averages (MA) Moving Averages Cross Rules (MACR) and Moving Averages Convergence/Divergence (MAVCD) and finds mixed forecasting results. Other studies, in this direction are Cheol-Ho and Irwin (2004), Hemalatha (2013), Jayakumar and Sumathi (2013), Pandya (2013), Singla (2014), Boobalan (2014), Jabeen and Jabeen (2017) and Fang (2017).

Stankovic, Markovic and Stoanovic (2015) this paper examines the efficiency of technical analysis and predictive modelling in defining the optimal strategy for investing in stock markets. The paper covers emerging market economies and uses technical indicators such as moving averages, MACD, RSI etc. it is based on least squares support vector machines model. The paper concludes that machine learning techniques capture nonlinear models adequately and this model outperforms buy and hold strategy in maximization of profitability on investment.

Pushpa, Sumithra and Hegde (2017) conducted technical analysis of select companies using data evidence from Nifty 50 based firms on different sectors in India from January 2011 to December 2016. The tools used for analysis include moving averages, RSI, Bollinger bands, and MACD. The findings result reveal that most of the stocks have technically strong position.

Venu, Vika, and Charithra (2019) utilized technical analysis to examine equity price movement in Asia. The study specifically sought to analyze the trends of stock price movement of twelve companies from three different sectors during the year 2018-19. The results of the analysis showed that the companies' stocks had progressive future growth.

2.4. GAP IN LITERATURE

From the review of the pertinent literature, there is obvious scarcity of empirical study using technical analysis to forecast securities in Nigeria. In addition, given the uncertain and unpredictable nature of the investment environment in Nigeria, particularly as it relates to the predicting stock movements, for which rational investors needs clear market signals to make efficient investment decision, a study as this is important as it fills the existing gap in literature, as well as offering critical intuition on security investment analysis.

3. METHODOLOGY AND EMPIRICAL STRATEGY

3.1. POPULATION OF THE STUDY

The methodology of this study, given the nature of the study is to identify the trend of the stock prices of selected companies using technical analysis. All the listed firms in the Nigerian Exchange Limited constitute the population of the study.

3.2. THE SAMPLE SIZE

The sample for the study consists of eight (8) major sectors disaggregated into agricultural conglomerates, construction/real estate, consumer goods, financial services, healthcare, industrial goods, and oil and gas to have a representative sample. The selection of these sectors is based on their relative influence and critical mass in the Nigerian Exchange Limited.

3.3. SOURCES OF DATA

The period examined covers a time span of 3 years from January 2017 to December 2020. The data for the study is collected from the Nigeria Exchange Limited (The operational trading arm of the Nigerian Exchange Group (NGX).

4. PRESENTATION OF RESULTS

4.1. SUMMARY OF STATISTICS

As an important tool of technical analysis, the summary statistics of the sampled firms is presented. As in past studies (see Venu et al, 2019; Pushpa, et al, 2019), the use of summary statistics gives a gloss and characterization of the stock series of the firms that are to be forecasted, as well as two other financial securities (Treasury Bills and Bonds). Summary statistics also give the trending pattern of the variables in terms of summaries and average performance over time. The results of the summary statistics are presented in Table 1.

From the summary statistics, it is observed that Treasury bill rates were higher, followed by dividend yield. This means that negative excess returns on each of the portfolios is expected. Thus, in terms of class of asset desired to be held, returns on Treasury bills are higher with less risk (considering the low standard deviation values). Dividend yields are also high, with low risks, suggesting that trading in the stock market foretells less return when compared with dividend policyholders in Nigeria.

Table 1: *Descriptive Statistics*

Assets	Mean	Median	Max.	Min.	Std. Dev.
Market Return	2.27	2.35	3.11	-0.28	12.90
Agriculture	2.34	2.26	4.11	1.76	13.28
Conglomerates	0.46	1.92	5.02	0.85	21.25
Construction/Real Estate	2.05	2.16	4.11	1.89	22.06
Consumer Goods	6.25	6.50	18.21	3.88	9.96
Financial Services	1.25	0.65	7.22	0.10	16.60
Health Care	2.26	1.35	5.50	0.82	24.95
Industrial Goods	0.90	3.01	5.62	1.20	32.88
Oil and Gas	3.31	4.87	10.201	1.62	23.08
Treasury Bill Rate	4.25	5.03	11.02	1.65	5.20
Dividend Yield	3.92	5.22	9.50	2.50	2.52

Source: Author's Computation, (2025)

Based on the individual sectors, the consumer goods portfolio clearly dominated all the other portfolios in terms of average returns. The consumer goods portfolio maintained consistently higher returns over the consideration period, as the sector performed creditably, with performance indices that surpassed the entire market performance in terms of return and risk (variability). The sector's portfolio also had the lowest standard deviation (volatility/risk) value compared to most of the other portfolios in the sample. This implies that the asset with less variations (or risk) performed better in returns over the sample period. Invariably, Technical analysis allows forward-looking investors to act according to price changes or signal and take advantage of strong fluctuations by recognizing trends and price levels in portfolio choice and asset prices.

Thus, using return on asset portfolio and risk (measured by standard deviation), the consumer goods portfolio outshined all other sectors. This outcome underscores the fast-moving nature of the consumer goods sector, making it less susceptible to economic and market vulnerabilities. The overall market return was, however, positive, and high. Conglomerates and industrial goods had the highest standard deviation values, suggesting higher market risks, but lower returns in the market. Oil and gas had good returns, but with high level of risk due to the high capital-intensive nature of the sector, coupled with global market vulnerabilities.

4.2. CHARTS

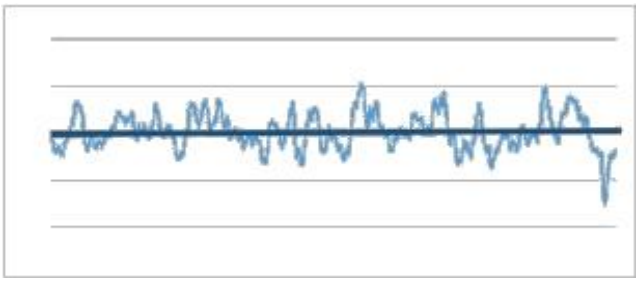

Figure 1*: Trend Pattern of Sectoral Average Stocks*
Source: Author's Computation, (2025)

The charts depicting the Moving Average (MA) of the sectoral stocks is shown in this subchapter.

From the graph of the technical analysis, values below the MA line indicate the optimal period to buy shares so as to resell later for returns. Similarly, values the line indicate the optimal period to sell, indicated by the upper point of the loop. Points on the line indicate buying and selling of shares. At such point, the investor is indifferent, as shares could be bought or sold, depending on market dynamics, exogenous influences, and behavioural and psychological factors, such as inertial, wealth effect and other considerations.

Sectoral Average Stocks

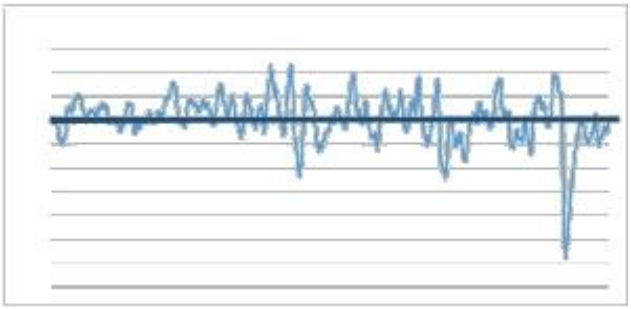

Figure 2: *Trend Pattern of sectoral average stocks*
Source: Author's Computation, (2025)

In the case of chart 2, stock prices are trading in the positive zone, an implication of a relatively good time to buy shares. The chart analysis indicates that on 16/09/2019 and 21/05/2020, market prices moved bottom/trough at 3.16 and 3.71, respectively. A close association exists between closing prices and 10 day moving average and 16 day moving average lines.

4.3. FORECAST ESTIMATES

The results from forecasting the individual sector in the market is presented and analyzed in this section. The forecast estimates are based on the expected returns of the individual sector.

For a three month (first quarter of 2022) in order to determine the optimal stocks to invest in. The forecast estimates are reported in Table 2, for a three-month forecast decomposed into 10 days-ahead forecasts, in order to attain some level of precision, given that changes/fluctuations in stocks occur at higher frequency, and the fact that lower frequencies generate potential higher estimation error.

The forecast estimates show that in the first ten days of January 2022, the overall average market return is would be 2.15, while the succeeding ten days in the month will be 2.20. The reason for this is that market activities are likely to experience a little lull, immediately after the yuletide. The last ten days according to the forecast estimate will hover around 2.25. The outperformance over the past days is likely to be induced by increased economic activities, as the market is likely to have picked up. Consumer goods, oil gas, financial services, and health care are expected to throw up impressive performance. The consumer goods sector is expected to pick up immediately, given its high level of inventory and goods demand, which tends to enhance its performance since such goods are usually fast-moving consumer goods (FMCG) with higher sales or sales turnover than those of other sectors.

The portfolio stocks of the consumer goods sector, as already shown in the summary statistics also tend to experience lower degree of market risk (volatility-indicated by the standard deviation), that tend to give it more market appeal. The oil industry, although with high prospect tend to be characterized by high variability (risk) given its highly-capital intensive nature. The agricultural sector, health sector, financial services are also likely to be probable look out for firms. With the rising pace of construction/real estate, the sector is also expected to experience phenomenal growth, particular given the high demand for residential and office buildings, which are grossly inadequate in Nigeria.

In line with the literature, performance of stock could be influenced by any of the following, information asymmetry, institutional reasons, ownership and control issues, behavioral reasons, risk and uncertainty and divergence of opinion. Following this, the phase dynamics of the asset portfolio in the cross-sectional firms could experience upper, lower and constant turning point based on these influences and other exogenous factors (such as the macroeconomic environment, characterized by the growth rate of GDP- a proxy for economic activities and inflation rate- a measure of the uncertainty imposed in the macroeconomic environment due to instability, as well as exchange rate variability).

Table 2: *Forecast Estimates of Returns*

Average Expected Returns Based on Forecast Estimates									
Assets	January			February			March		
	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts	10 days Ahead forecasts
Market Return	2.18	2.20	2.25	2.13	2.17	3.13	3.22	2.74	2.65
Agriculture	3.66	3.18	3.22	3.12	3.10	2.88	3.25	3.55	4.32
Conglomerates	1.78	1.82	1.67	1.52	1.58	1.67	1.75	1.78	2.18
Construction/Real Estate	2.98	2.06	2.16	2.15	2.18	2.23	2.35	2.38	2.60
Consumer Goods	3.62	3.72	4.15	4.20	4.22	4.50	4.65	4.77	5.15
Financial Services	2.18	2.19	2.35	2.19	2.23	2.25	3.50	3.07	3.15
Health Care	2.17	2.34	2.16	2.32	2.17	2.19	2.56	2.95	3.10
Industrial Goods	1.68	1.67	1.50	1.65	2.10	-0.31	1.21	1.31	2.82
Oil and Gas	3.28	3.31	3.44	3.14	3.28	3.15	4.22	4.15	4.95
Treasury Bill Rate	3.16	3.90	3.90	3.50	3.50	3.52	3.50	2.95	3.21
Dividend Yield	2.88	2.98	3.10	3.12	3.17	3.10	2.95	2.90	2.92

*Note: *' * * (**) denotes significance at 10%, 5% (1%) level*

Source: Author's Compilation, (2025)

The forecast estimates show that the industrial goods sector may expectedly experience a decline in the last ten days of the month of February, 2022; a forecast estimate that could be explained by the continuous downward (decline) in the performance of the manufacturing and industrial sectors, arising from exorbitant costs of inputs, exchange rate volatility, epileptic power supply and general insecurity.

For financial assets (Treasury Bill and Bonds), their return expectedly may experience marginal increases, but fluctuation will set in due to monetary policy intervention, which is likely unpredictable. However, given that they are gilt-edge securities, investors may find them appealing and safe haven.

5. CONCLUSION

In line with previous evidence, price move in trends, investors should evaluate their decisions based on both fundamental and technical analysis. Stock market provides great opportunity both in short term and long term only for informed investors and professionals. Indicators such as forecasts estimates and summary statistics give strong signals as to the direction in which the company is heading as well as helping to identify the average performance of stocks over time. The technical approach to invest is essentially a reflection of the idea the price moves in line with the psychology and attitude of investors towards a variety of economic, monetary forces. Technical analysis works best on current market, intermediate on future market and stock market. Technical analysis is widely accepted worldwide and a very useful tool for the analysis of share price behavior. It is risky to trade in volatile market because at any point of time the stock can be drop and can go up. Sometimes there will be difficult to decide when to enter and exit the share.

In general, technical analysis allows an investor or probable investor to act according to price changes or signals and to take advantage of strong fluctuations. Thus, optimal investment decisions are made using technical analysis by having a purview of the likely (expected movement) of security prices and volatilities. Nevertheless, technical analysis has its limitations, as it is not always 100% effective. For instance, It is risky to trade in volatile market since fluctuation or instability in the market any point of time makes it difficult to take good investment decisions.

Using evidence from eight (8) major sectors across various spectra, consisting of agriculture, conglomerates, construction and real estate, consumer goods, financial services, health care, industrial goods, oil and gas, with the inclusion of treasury bills and bonds, this study utilized technical analysis to forecast the stocks movement in based on evidence from the Nigerian Exchange Limited. The overall findings show that stocks with higher return and lower risk (variability) tend to be optimal in terms of investment choice.

Based on the empirical analysis, it is recommended that investors get a broad-based understanding of the pattern, movement and dynamics of stocks based on a combination of internal market forces and exogenous influences in order to

make efficient a d optimal investment decision, with respect to predicting of future price of securities which can help in formulating appropriate buy-hold- sell decisions. In addition, it is advisable to invest in long term in order to reduce the risk in the volatile market. The investor should also invest in different companies' stock in order to set off losses incurred on the particular share to the profit earned in the other shares. Apart from technical analysis, the investor should also undertake to study the behavior of stock on daily basis and understand issues relating to company or sector in order to make good investment decisions at any point in time.

REFERENCES

Aronson, D. R. (2006). Data analysis for forecasting. *(IJMER) progress, 9* (2), (2006).

Asif-Ullah K., & Bhupesh, C. (2011). NIFTY and selected stocks identified by SOM using technical indicators. (*IOSR-JCE), 14* (2), 278-872.

Ayyappan, S., & Sakthivadivel, M. (2012). Growth and trend analysis of key profitability factors in scheduled commercial Banks. *Asian Journal of Managerial Science, 2*(1), 7-21.

Hemalatha, M. K. (2013). A study on technical analysis of Canara bank equity *2*(4), 18-32.

Jayakumar, A., & Sumathi, K. (2013). Technical Analysis of share price movement with special reference to Public Sector Bank. *Review of Financial Studies*, *2*(5), 527-551.

Sudheer, V. (2012). Study on technical analysis in selected companies in India. *International Journal of Business and Administration Research Review, 2*(4), 36-44.

Boobalan, C. (2014). Technical analysis in select stocks of Indian *Companies. Research paper IJBARR, International Journal of Business and Administration Research Review, 2*(4), 26-34.

Cheol-Ho, P., & Irwin, S. (2004). The profitability of technical analysis: A review. DOI: 10.2139/ssrn.603481, https://www.researchgate.net/.../ 23517467.

Chitra, R. (2011). Technical analysis on selected stocks of energy sector. *International Journal of Management & Business Studie*s, *1*(1), 42-46. (2011)

Demers, A. (2021). Benefits and limitations of technical analysis. Traders 360 Inc, National Bank Directorate Brokerage, USA.

Fama, E.F. (1970). Efficient capital market: A review of theory and empirical work. *Journal of Finance*, 25, 383-417.

Fama, E.F. (1991). Efficient capital markets II. *Journal of Finance*, *46*(5), 1575-1617.

Fang, Y.D. (2017). The profitability of technical analysis: A review https://www.researchgate.net/publication/23517467_ [accessed Aug 7, 2017].

Pandya, H. (2013). Technical analysis for selected companies of Indian IT sector. *International Journal of Advanced Research*, *1*(4), 430-446.

Jabeen, S., & Jabeen, A. (2017). Technical study of pharmaceutical stocks listed in NSE. *SSRG – IJEMS 4*(3), 50-62.

Lo, A. W., Mamaysky, H., & Wang, J. (2007). Foundations of technical analysis: Computational algorithms, statistical inference, and empirical implementation. Cambridge: *National Bureau of Economic Research, 54*(5), 17-20

Menkhoff, L., & Taylor, M. P. (2006). The obstinate passion of foreign exchange professionals: Technical analysis. *Journal of Economic Literature, 45*(4), 936972.

Menkhoff, L., & Schlumberger, M. (1997). Persistent profitability of technical analysis on foreign exchange markets? *Banca Nazionale del Lavoro Quarterly Review, 24(*193), 189-216.

Mishra, A. (2012). Fundamental vs. technical Analysis. *(IJCBM), 2*(5), 2319-2828.

Narwhal, D. (2007). A fundamental and technical analysis of the stock price. (IOSR-JCE), *10*(4), 66-78.

Naved, M. (2012. Profitability of oscillators used in technical analysis for financial market. *Finance Review, 2*(9), 42-56.

Neely, C., & Weller, J. (2002). Technical analysis and the profitability of U.S. foreign exchange intervention. *Review - Federal Reserve Bank of St.Louis, 80*(4), 3-17. (2002)

Pushpa, B.V., Sumithra, C.G., & Hegde, M. (2017). Investment decision making using technical analysis: A study on select stocks in India Stock Market. *IOSR Journal of Business and Management (IOSR-JBM), 19* (9), 24-33.

Roberts, M.C. (2010). Technical analysis and testing a commodity portfolio. *International Journal of Managerial Finance, 13*(4), 475-488.

Singla, R. (2014). Technical analysis used to predicted the markets. *IJCSMC, 5*(6), 56-62.

Stankovic, J., Markovic, I., & Stoanovic, M. (2015). Investment strategy optimization using technical analysis and predictive modelling in emerging markets, *9*(4), 51-62, https://doi.org/10.1016/S2212-5671(15)00007-6.

Suresh, A.S. (2010). Fundamental analysis vs. technical analysis. *UNIMAS Review of Accounting and Finance, 1*(1), 72-85.

Varathan, N., & Tamilenthi, B. (2012). Stock price movements through technical analysis, *Indian Journal of Finance*, 2(2), 15-27

Venkatesh, C., & Tyagi, M (2011). Technical Analysis and its usage in Indian Capital Market. IJCSMC, *4*(9), *India Journal of Risk and Investment Analysis*. *Journal of Research and Development, 4*(5), 105-116

Venu, V, Vikas, B., & Charithra, C.M. (2019). Equity research using technical analysis. *International Journal of Research and Innovation in Social Sciences (IJRISS)*, *3*(8), 217-225.