CHAPTER2

LITERATURE REVIEW

2.1 Introduction

The financial market trades with prevailing economic conditions and is hence vital for businesses and investors because of its volatility. More accurate forecasting of the market's dynamics can help businesses establish fairer and more efficient strategies and may also enable the investors to put their money in the place that gives them the best return. Nonetheless, the complexities of the financial market make it hard for any offline prediction mechanism to understand the heightened interactions.Because the key factors that affect market trends include: economic indicators, company performance indicators and investor sentiment indicators. This literature review discusses the impact of these factors and uses time series models such as ARIMA, SARIMA and exponential smoothing for accurate forecasting.

2.2 Economic Indicators

Among economic indicators, Macroeconomic factors like GDP, inflation, and interest rates are crucial for understanding market trends. (Levitt, A. 2008)These indicators shed light on the viable and developing prospects of the ultra-modern economy influencing a vast range of sectors, businesses, and consumer behavior.

Gross Domestic Product (GDP): GDP represents the total market value of all final goods and services produced within a country in a given period (Samuelson & Nordhaus, 2010)The growing GDP indicates a vibrant economy where people are employed and spend more. A sustained decline in GDP could mean the economy is not growing, stagnating, or going into a recession stage (Romer, 2012). Not only does this knowledge of GDP movement spur business and policymakers in anticipating shifts, it also helps in demand and investment pattern projection (Mankiw, 2014).
Inflation: Inflation, that is, the rate at which an average price level of commodities and services generally rises, is a key element in all economic analysis (Blanchard, 2017). Normal inflation rates demonstrate that the economy is advancing, while room for folly is identified by those who despise excessive inflations and how it influences the purchasing power and confidence of the consumer (Friedman, 1968). Central banks engage in the implementation of monetary policy as a way of

influencing the economy by controlling the interest rates and the money supply (Mishkin, 2015).

Interest Rates: Interest rates, which are mainly the concern of the central banks, are the most significant reason in the running of the economy through determining borrowing, investing, and saving trends (Bernanke, 2010). The result of high-interest rates is to make borrowing unattractive so as reduce the money circulation in the economy, while low-interest rates might encourage spending and borrowing which in return may stimulate the growth of the economy (Clarida, Gali, & Gertler, 1999). The relationship between interest rates and inflation is key in the management of the macro economy. Given, central banks have to adjust their rates accordingly in order to curb inflation to ensure that the economy is stable (Taylor, 1993).

2.3 Company Performance Indicators

Among company performance indicators, capital market research should focus on how to extract effective signals that can predict market reactions from accounting information. (Kothari, S. P. 2001)Evaluating a firm's performance involves comparing the financial and operational indicators and evaluating the correlation with the company's overall market value. Therefore, these indicators display the financial health of the firm and at the same time provide predictive signals and sentiments about its future performance and the market in general. KPIs like profitability, liquidity, efficiency, and leverage ratios are often used to determine a company's ability to survive in the market and to guide the investors in their investment decisions.

Profitability Ratios: The profitability ratios, i.e., return on equity (ROE), return on assets (ROA), and profit margins, are the indicators of a company's (CCIE) generation of the profits in the relation to the revenue, assets, and equity. Such ratios seem to be used by investors as a means of assessing the extent to which a company converts its resources into profit. The information extracted from such performance indicators can have a significant impact on stock price movements, as high profitability often signals strong growth potential, positively influencing investor sentiment (Penman, 2013).

Liquidity Ratios: Liquidity ratios, which include the current ratio and quick ratio, show how well a company can pay its short-term obligations due to liquid assets. These ratios are key indicators for understanding debtors' financial soundness, as companies with sufficient liquidity are better positioned to withstand uncertainty and unexpected risks, which makes them more attractive to the creditors (Pervan et al. 2019).

Efficiency Ratios: Efficiency ratios, for instance, asset turnover ratio and the inventory turnover rate, are surely very pivotal criteria to gauge how effectively the company is profiting from its assets. Increased efficiency fairly reveals better operational and potential for profits, while inefficiency leads to increased operational costs and

hindrance of profit . Market participants closely watch efficiency indicators as they offer insights into the company's cost structure and capacity to deliver consistent earnings (Graham & Dodd, 2009).

Leverage Ratios: The like of debt-to-equity ratio is the one used to determine how much of a company evades structural decisions that they can derive profits from. While adequate leverage can be the driver for increased returns and insight on the success of the company due to vision for growth, excessive leverage poses a serious demand of high financial risk, which in turn may impair companies' capability to cope with market wavering; hence recommended to the investors with a cautionary voice. The market's interpretation of a company's leverage influences stock price fluctuations and signals investors regarding the level of risk they might face (Miller & Modigliani, 1961).

Apart from traditional financial indicators, performance indicators of a firm, when derived from accounting data also essential to understanding the company's financial health and its evolution. Capital market research makes use of those indicators to produce ahead of time those predictive signals that will aid investors in forecasting what will be the market reaction afterward, helping them to make informed investment decisions and to manage their risks. By analyzing how market participants respond to changes in these performance indicators, analysts can better forecast future movements in stock prices and overall market behavior (Kothari, S. P. 2001).

2.4 Investor Sentiment Indicators

There are sentiment indicators that help determine the sentiment of investors - VIX is the one such instrument used in the stock market. VIX index is also acknowledged as a "fear gauge" which usually goes up during times of market hesitation， uncertainty or crisis, reflecting the sharp growth of the investor's fear that was noted in the market. During these times, investors anticipate higher volatility, and the demand for options as a hedge against market downturns increases, causing the VIX to climb (Whaley, R. E. 2000). In contrast, when the market is relatively stable, and investor confidence is high, the VIX tends to be lower, indicating a calm and optimistic outlook among market participants (CBOE, 2023).

VIX and Market Movements: Because the correlation between the VIX and the overall market is most often observed in the negative cases, it is a certainty that the score of the market against the volume of VIX is inversely related. In case the market becomes uncertain or fear is getting higher, and consequently the VIX grows, it is normally a sign that the market is heading towards a drop or the risk for the investments is getting higher.The VIX can also serve as a leading indicator, as sharp increases in volatility often precede downturns or corrections, while declines in the index can signal periods of economic recovery or market stability (Fear & Gustafsson, 2011).

2.5 ARIMA, SARIMA and exponential smoothing for accurate forecasting

Time-series forecasting plays a crucial role in a number of disciplines, such as finance, logistics, and energy management. Autoregressive Integrated Moving Average (ARIMA), Seasonal ARIMA (SARIMA), and Exponential Smoothing are but some of the techniques that offer powerful tools for analytical data used in making decisions. Models are defined based on the time-series data of different patterns observed in the data, and whose main application is dependent on those patterns.ARIMA is especially suitable for data that needs stabilization before forecasting, such as economic or stock price time-series (Box et al., 2015).For example, Akaike (1974) demonstrated ARIMA's power in financial forecasting through its ability to analyze and predict stock market trends using historical price data. An example includes its use for predicting daily stock price indices by combining ARIMA with additional autoregressive terms for error adjustment.

2.6 Comparative Performance of ARIMA, SARIMA, and Exponential Smoothing

Aspect	ARIMA	SARIMA	Exponential Smoothing
Seasonality Handling	Not explicitly modeled	Explicitly modeled	Modeled in Holt-Winters variant
Trend Management	Captures through differencing	Combines differencing and seasonal components	Captured in Holt’s method
Computational Cost	Moderate	High due to additional parameters	Low to moderate
Forecasting Horizon	Short-to-medium term	Medium-to-long term	Short-term

Conclusion: Each model (ARIMA, SARIMA, and Exponential Smoothing) has its strong and weak points among the applications of forecasting in time series. ARIMA works exceptionally well in a scenario that captures non-seasonal elements, SARIMA provides an extremely good fit for datasets that depict cyclical patterns, on the contrary, Exponential Smoothing is known for its approach of having an easy and flexible application in real-time systems.

References

Levitt, A. (2008). Economic indicators that help predict market trends. *Investopedia.* Retrieved December 14, 2024, from https://www.investopedia.com/articles/economics/08/leading-economic-indicators.asp

Bernanke, B. S. (2010). The effects of the Great Recession on central bank policies. *Journal of Economic Perspectives, 24*(4), 3-18.
Blanchard, O. (2017). *Macroeconomics* (7th ed.). Pearson.
Clarida, R., Gali, J., & Gertler, M. (1999). The science of monetary policy: A new Keynesian perspective. *Journal of Economic Literature, 37*(4), 1661-1707.
Friedman, M. (1968). The role of monetary policy. *American Economic Review, 58*(1), 1-17.
Mankiw, N. G. (2014). *Principles of economics* (7th ed.). Cengage Learning.
Mishkin, F. S. (2015). *The economics of money, banking, and financial markets* (10th ed.). Pearson.
Romer, D. (2012). *Advanced macroeconomics* (4th ed.). McGraw-Hill.
Samuelson, P. A., & Nordhaus, W. D. (2010). *Economics* (19th ed.). McGraw-Hill.
Taylor, J. B. (1993). Discretion versus policy rules in practice. *Carnegie-Rochester Conference Series on Public Policy, 39*, 195-214.

Graham, B., & Dodd, D. L. (2009). *Security analysis: Sixth edition*. McGraw-Hill.
Kothari, S. P. (2001). Capital markets research in accounting. *Journal of Accounting and Economics, 31*(1-3), 105-231.
Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *Journal of Business, 34*(4), 411-433.
Penman, S. H. (2013). *Financial statement analysis and security valuation* (5th ed.). McGraw-Hill.
Pervan, M., & Mijoč, J. (2019). *Analysis of liquidity and financial stability ratios in Croatian companies*. Croatian Journal of Business Economics, 6(1), 55-70.

CBOE. (2023). Volatility Index (VIX) FAQs. Chicago Board Options Exchange.

Fear, J. M., & Gustafsson, C. L. (2011). The VIX and market volatility: Understanding the fear factor. *Journal of Finance, 67*(3), 979-1009.
Whaley, R. E. (2000). The investor fear gauge. *Journal of Portfolio Management, 26*(3), 12-17.

Box, G. E., Jenkins, G. M., Reinsel, G. C., & Ljung, G. M. (2015). *Time series analysis: Forecasting and control* (5th ed.). Wiley.
Akaike, H. (1974). A new look at the statistical model identification. *IEEE Transactions*

on Automatic Control, 19(6), 716–723.