Jurnal Akuntansi, Keuangan, dan Manajemen (JAKMAN)
ISSN 2716-0807, Vol 7, No 3, 2026, 109-123 https://doi.org/10.35912/jakman.v7i3.6338

Comparative Analysis of Stock Valuation Models in Indonesian Shipping Companies

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Article History
Received 18 February 2026
1st Revision 23 February 2026
2nd Revision 26 February 2026
3rd Revision 07 March 2026
Accepted on 17 March 2026

Abstract
Purpose: This study comparatively examines the effectiveness of three widely used stock valuation models in explaining the stock prices of shipping companies listed on the Indonesian Stock Exchange, with the aim of providing insights into their applicability and relevance in the context of the Indonesian market.
Methodology: This study employed a quantitative research design using secondary panel data from Indonesian listed shipping companies from 2018 to 2023.
Results: The findings indicate that although the Earnings-Based Model (EBO) and Price-to-Earnings (P/E) models showed partial significance with limited explanatory power, the P/S model demonstrated the strongest and most consistent influence on stock prices.
Conclusions: Although the EBO model showed an extremely high Adjusted R^2, it indicated unrealistic overvaluation, while the P/E model had limited explanatory power. Overall, the P/S model is the most appropriate and representative model for valuing Indonesian shipping stocks.
Limitations: This research is limited to shipping companies listed in Indonesia during the 2018–2023 period and relies solely on quantitative secondary data, which may not capture broader macroeconomic or industry-specific external factors.
Contributions: This study enriches the capital market literature by providing sector-specific empirical evidence of the comparative performance of valuation models in an asset-intensive and cyclical industry.

Keywords: *Asset-Based Industries, Emerging Markets, Employee Performance, Islamic Bank, Organizational Culture*

How to Cite: Maulana, D. Y. (2026). Comparative Analysis of Stock Valuation Models in Indonesian Shipping Companies. *Jurnal Akuntansi, Keuangan, dan Manajemen*, 7(3), 109-123.

1. Introduction

The Indonesian economic crisis was felt in July 1997 and was experienced throughout all sectors, including the capital market (Alvia, Anshari, & Batubara, 2022; McHugh, 2023). The effect of this crisis was a reduced stock price and value of capitalization (Khasanah, Wijaya, & Sidik, 2025). The capital market is a significant segment of the national financial mechanism used to raise long-term funds among the population and invest in productive fields (Budiman, 2026; Noventin Entelina & Dio, 2025). By facilitating the efficient distribution of funds, the capital market supports economic development through its intermediary role between surplus and deficit capital holders in the economy. Despite these functions, high interest rates and economic uncertainty have led investors to seek alternative investment opportunities with potentially higher returns, causing investment activity on the Indonesia Stock Exchange (IDX) to decline. To counteract this, the government allowed foreign investors to purchase shares on the IDX to increase the sources of long-term capital.

The shipping industry has been particularly affected by global economic fluctuations owing to its capital-intensive nature and vulnerability to volatile market conditions. Shipping demand and supply are highly unpredictable, and historical evidence shows that changes in global economic conditions,

including those in the 1950s, have influenced both production and charter activities within the industry (Achmadi & Baqi, 2025; L. Dewi, Fitria, Nidia, & Sitio, 2024; Hadi, Azisah, & Andarwati S T F, 2025). The stock price dynamics of Indonesian shipping companies, based on IDX data (2018–2023), demonstrate significant fluctuations. For example, TMAS shares fell sharply from 800 in 2018 to 6 in 2020 and then rose to 239 in 2022, whereas BLT remained relatively stable at around 62.5 over the same period. The number of HITS declined from 730 in 2018 to 366 in 2021–2022, with a slight increase to 376 in 2023. SMDR and NELLY stocks remained stable at approximately 100, suggesting stagnation or minimal trading activity. Overall, this trend illustrates the mixed stock price movements in the shipping industry, with many companies experiencing severe market pressure following the global financial crisis (Kundori, Fauziningrum, & Sukrisno, 2025).

Stocks inherently have two attached values: the nominal value, as indicated on stock certificates, and the market value, determined by supply and demand within the exchange (Febriyanti & Delfiani, 2023). The stock price is a critical indicator for both investors and companies, as it reflects the issuer's economic health and future prospects (Rahmawati & Hadian, 2022). Various factors influence stock price movements, including interest rates, exchange rates, foreign capital flows, government policies, and broader market environments (Wulandari, Saladin, & Mulyani, 2024). The 1997 economic crisis, marked by a sharp depreciation of the rupiah against the US dollar, caused a drastic decline in stock prices and the Composite Stock Price Index, reducing investor confidence in the capital market (Purwantini & Jayanti, 2026). Thus, stock price changes serve as an important measure of both firm performance and investor behavior.

Several factors, including fundamental, technical, social, and political-economic factors, influence stock prices. Fundamental factors include sales, profits, dividend policies, and cost efficiency, which play key roles in stock valuation. Fundamental analysis assesses a company's intrinsic stock value based on financial data using approaches such as the present value method and the Price-to-Earnings (P/E) ratio (Qalbu, Wijayanto, & Listyani, 2025). This analysis helps investors evaluate profitability and future prospects, forming the basis for rational investment decisions in the stock market. Fundamental analysis is conducted in three primary steps: macroeconomic, industry, and company analyses. Macroeconomic analysis examines external factors affecting a company’s performance, including monetary policy, inflation, interest rates, exchange rates, budget balances, foreign reserves, political stability, and local and international stock market indices (Kesuma, Widaryo, Irianto, & Aini, 2025). These factors provide a picture of economic stability and the investment climate. Industry analysis assesses a company’s position within its sector, considering competition, industry standards, market growth, and its relative standing among peers (Porter, 1979). Company analysis focuses on internal factors such as financial status, management systems, marketing strategies, and production efficiency (Awaliya et al., 2023). Analysts use financial ratios, including liquidity, activity, debt, and profitability ratios, to estimate potential stock value and future profits.

Five major valuation models are widely used in fundamental analysis: the Earnings-Based (EBO) model, Price-to-Earnings (P/E) Model, Price-to-Sales (P/S) Model, Price-to-Book Value (P/B) Model, and Economic Value Concept (EVC) model. These models emphasize net profit as a critical measure of company performance. An increase in net profit signals good business growth and efficiency in cost management, which positively influences shareholder value. Conversely, weak performance is typically viewed negatively by investors and lowers stock prices. The financial sector is also shaped by macroeconomic shocks. The 1998 financial crisis placed many financial firms under pressure due to substantial debts denominated in US dollars (Chalandra, Hidayah, & Aulia, 2025), bank liquidations and increased interest rates, further weakening investor confidence. The liquidation of 16 national banks by Bank Indonesia further undermined investor confidence. Rising loan interest rates, reaching up to 50%, have made it difficult for entrepreneurs to meet their financial obligations, aggravating market instability.

Stock prices remain a crucial component of company valuation; higher prices indicate stronger company performance (Novianti, Asmeri, & Silvera, 2023). Rational investors consider multiple economic variables before deciding to buy or sell shares, including company profitability, inflation, national

economic conditions, regulatory policies, and management decisions. These variables influence investor behavior, as reflected in stock price movements, trading volumes, and the Composite Stock Price Index. According to Fama and French, the fundamental factors affecting stock prices include earnings, company size, earnings growth, and risk (Buditomo, Candra, & Soetanto, 2024). Similarly, Kim (2021) highlights valuation models such as EBO, EVC, P/E, P/S, and P/B. For this study, three primary models, EBO, P/E, and P/S, are selected, as EVC and P/B are less applicable to the Indonesian context during the observation period. Preliminary regression analysis indicated insignificant results for the two models. To improve the explanatory power, the current study introduces lagged variables (Price t-1, P/E t-1, P/S t-1) to capture the effects of fundamental factors more comprehensively.

Despite extensive research on valuation models, empirical comparisons in Indonesia's shipping sector remain limited. Significant stock price fluctuations in this capital-intensive and volatile industry raise questions regarding which valuation model most accurately explains the market behavior. This study focuses on how fundamental factors influence the stock prices, P/E ratios, and P/S ratios of shipping companies listed on the IDX and aims to identify the model that most reliably represents market dynamics. This study comparatively examines the effectiveness of three primary stock valuation models Earnings-Based Model (EBO), Price-to-Earnings (P/E), and Price-to-Sales (P/S) in explaining stock price movements, while also assessing the impact of fundamental factors such as earnings, company size, earnings growth, and risk. This study contributes original, sector-specific empirical evidence by incorporating lagged variables (Price t-1, P/E t-1, P/S t-1) to provide a more comprehensive understanding of stock price determinants, thereby enriching the literature on stock valuation in emerging markets and offering practical guidance for investors, analysts, and financial managers in selecting appropriate valuation models for shipping companies.

2. Literature Review and Hypothesis Development

2.1 Capital Market

Long-term financial instruments traded in the capital market include both equity (stocks) and debt Brummitt, Huremović, Pin, Bonds, and Vega-Redondo (2017), which are issued by public sector institutions and companies. Law No. 8 of 1995 on Capital Markets includes activities involving public offerings and trading of securities. Fahmi views the capital market as a mechanism where different entities, especially companies, issue shares and bonds to secure more funds or to supplement their capital base (Palupi & Suhendi, 2020). The capital market serves as a platform through which a broad category of long-term financial instruments is traded, including bonds, equities (stocks), mutual funds, derivative instruments, and other forms of securities. The capital market has several important players, with such players having specific yet interconnected roles: issuers, underwriters, capital market authorities, stock exchanges, brokers, and investors (Fabozzi, 2025). The capital market is a crucial element of a country's economy. Some of its key purposes include long-term sources of finance for businesses as well as the most efficient use of financial resources. It further provides investors with a chance to pool their capital and diversify their investment projects to avoid risks.

Moreover, the capital market is the most important indicator of economic tendencies in the nation, as price changes in stocks and the trading market may represent the state of the economy as a whole. The capital market also stimulates the acculturation of corporate stocks in the middle class to increase the involvement of people in economic matters. Capital markets assist in establishing a healthy, transparent, and competitive business environment through information transparency, good corporate governance, and professionalism. While prior studies have comprehensively described the roles and mechanisms of the capital market (Fabozzi, 2025). Few empirical studies have analyzed how capital market structure influences the performance of valuation models in industry-specific- contexts, particularly in capital-intensive- sectors such as shipping companies, where market patterns may differ from broader market behavior.

2.2 Stock

A stock is a security that represents the ownership of an individual or entity in a company. The stock price reflects the present value of future cash flows that shareholders expect to receive. The stock price is the market price of a stock traded on the stock exchange (Angkasaputra, Nugraha, Suwondo, &

Manihuruk, 2022). Various market conditions can influence the stock prices. For instance, the price of a stock in the primary market is determined by the underwriter and issuing company (issuer) based on an analysis of the company's fundamental performance (Pariska & Berliani, 2025). According to Humphrey and Li, stocks are ownership-based securities traded in the capital market (Humphrey & Li, 2021). They signify a portion of ownership held by an individual or business entity in a company or limited liability corporation (Suwono & Sartinah, 2021). Stocks are generally divided into two main types: common and preferred stocks, which are described as follows:

a. Common stock is a security that serves as proof of ownership by an individual or institution in a company. The term "security" refers to an instrument that holds value and can be traded in the market.
b. Preferred stock offers a fixed income in the form of dividends paid regularly, usually quarterly, either as a fixed amount (in local currency) or as a percentage of the stock's par value. Preferred stock combines the characteristics of both bonds and common stock.

Common stock has several key characteristics, including granting its holders the right to a company's income (income claims) and assets (claims on assets). Additionally, common shareholders have voting rights in general meetings of shareholders, limited liability to the extent of their capital contribution, and pre-emptive rights, which allow them to purchase new shares before they are offered to external parties when the company issues them. However, preferred stocks differ in several aspects. Preferred shareholders are entitled to receive dividends before common shareholders and have cumulative dividend rights, meaning they can claim unpaid dividends from previous years (Larasati & Ramadhan, 2022). Preferred shareholders have priority rights during liquidation, entitling them to receive payments before common shareholders if the company is dissolved. Prior literature clearly defines stock characteristics and market pricing mechanisms, but empirical links between stock types, ownership features, and valuation outcomes within specific sectors, such as shipping, are relatively underexplored. Most studies treat stock valuation generically across industries rather than testing how these attributes interact with valuation models in a nuanced industrial context.

2.3 Stock Analysis

Stock analysis is carried out to determine the intrinsic value of a stock, which is the true or fundamental value of that stock. This intrinsic value is then contrasted with its current price in the marketplace to determine whether the stock is undervalued or overvalued. The intrinsic value is the present value of future cash payments for the stock. Three general guidelines are applied to stock valuation. To begin with, when the market value of a stock is above the intrinsic value, the stock is said to be overvalued; that is, it is overpriced. Second, when the market price is equal to its intrinsic value, the stock is considered fairly rated and in equilibrium. In this case, investors are normally advised against buying or selling the stock, as the price clearly reflects the true value of the stock. Third, when the market price is below the intrinsic value, it is undervalued; that is, it is underpriced. Investors are advised to maintain the undervalued stocks, which they hold, because there is a likelihood that their prices will increase in the future (Harwaningrum, 2016). Although the literature on valuation theory explains broad guidelines for intrinsic valuation, few studies have investigated how these analyses perform when applied to valuation model comparisons (e.g., EBO vs. P/E vs. P/S) in specific industries, such as shipping, where cash flow predictability and industry structure differ significantly from general market benchmarks.

2.4 Stock Valuation Models

Robert Ang states that stock valuation is a process used to determine the intrinsic or fundamental value of a stock based on an analysis of its risk and return performance (N. Dewi & Saryadi, 2016). Various approaches are commonly applied to calculate a stock's intrinsic value, as suggested by Penman, including the Dividend Discount Model (DDM), the Discounted Cash Flow (DCF) model, and the Residual Earnings Model (REM) (Salem, 2021). This intrinsic value is often referred to as the normative stock price. If the intrinsic value is lower than the market price, the stock is regarded as overvalued, and it is recommended to sell it because the price likely reflects excessive market optimism.

Conversely, if a stock is undervalued, investors should consider buying it because the price is expected to rise in the future. Among these valuation methods, the Residual Earnings Model (REM) has been

found to estimate equity value more accurately than the other models (Dividend Discount Model and Discounted Cash Flow Model), as it produces a smaller margin of error in the valuation results. Prior studies illustrate the theoretical and practical mechanisms of valuation models, but they seldom empirically compare multiple models within the same industrial context. In particular, sector-specific applications in asset-intensive- and cyclical industries, such as shipping, remain limited, reducing the clarity of which model is most appropriate for such contexts.

2.5 EBO Models

This model was developed based on the concept introduced by Edwards, Bell, and Ohlson, which integrates the dividend discount model with the relationship of residual (abnormal) earnings. The model states that a stock's price is a function of its book value and the present value of expected future abnormal earnings (Maulana, 2024). Over time, many researchers have simplified the EBO Model by asserting that stock prices are influenced primarily by a company's earnings and book value of equity. The formulas for calculating Earnings and Book Value are as follows:

$$\text{Earnings} = \frac{\text{Net Income}}{\text{Number of Outstanding Shares}} \quad (1)$$

$$\text{Book Value} = \frac{\text{Equity Capital}}{\text{Number of Outstanding Shares}} \quad (2)$$

While the EBO model is robust in theoretical development Maulana (2024), empirical evidence comparing its performance against other models (P/E, P/S) in volatile sectors is limited, and past research often focuses on predictive power in general markets rather than industry-specific- assessments.

2.6 P/E Model

The Price-to-Earnings (P/E) model illustrates how much investors value a company's stock price relative to its Earnings per Share (EPS). This ratio shows the proportion between the market price of a stock and the company's current profits (Abdullah & Hendrawan, 2025). According to Jitmaneeroj (2017), the P/E coefficient is influenced by three main factors: beta, earnings growth, and the dividend payout ratio. Investors generally use profitability and market ratios to make investment decisions, as stock price fluctuations are affected by earnings and various market factors (Dwijayani, Marzuki, & Sari, 2023). Some key indicators in this analysis include the following:

2.6.1 Earnings per Share (EPS):

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}} \quad (3)$$

2.6.2 Price-to-earnings ratio (P/E):

$$PE\ ratio\ = \frac{Price\ per\ Share}{Earning\ per\ Share} \quad (4)$$

2.6.3 Market-to-Book Ratio (M/B):

$$Market - to - book - ratio\ = \frac{Market\ Value\ per\ Share}{Book\ Value\ per\ Share} \quad (5)$$

The P/E Model serves as an important reference for assessing the fairness of a stock's price, as it reflects market expectations regarding a company's earnings growth and risk**.** Numerous studies deploy the P/E ratio for valuation; however, comparative analyses versus models such as P/S and EBO within specific industries, such as shipping in Indonesia, are rare, leaving questions about model robustness unanswered.

2.7 P/S Model

In this model, the P/S ratio is a function of Profit Margin, Payout Ratio, Earnings Growth, and Beta (Thakur & Kannadhasan, 2018). It measures profitability in relation to revenue (sales), with sales as the denominator. This calculation refers to the income statements. Generally, profitability ratios are easy to understand; the higher the level of profitability, the better it is for the company. In terms of profitability, the Profit Margin is a key measure used as a basic indicator.

$$Margin\ Profit\ =\ \frac{Net\ Income}{Sales} \tag{6}$$

While prior research has shown that P/S can capture aspects of sales-based- valuation, many studies focus on broad markets rather than on whether P/S outperforms other models in asset-intensive- sectors, particularly in emerging markets like Indonesia.

2.8 Financial Statement Performance

Investors require relevant information to forecast the consequences of their investments in the capital market. The information is typically categorized into two types: fundamental and technical information. Basic information is associated with the financial status and performance of a corporation in terms of financial statements, financial ratios, cash flows, and other performance indicators related to stock returns (Kleymenova & Tuna, 2021). Fundamental analysis is used to predict the future prices of stocks by considering the underlying factors that influence prices. Francis sees the basic methodology as the evaluation of stocks depending on the financial health and economic conditions of a company, and Jogiyanto considers it an endeavor to determine the intrinsic value of a stock by analyzing the financial data of a company (Setiawan & Saputra, 2022).

Fundamental analysis enables investors to evaluate whether a stock is overvalued or underestimated. Financial ratios are used to depict the core performance of a company, and this involves comparing two elements of the financial statements to show the financial position of the company at a given time. These ratios make financial information easier to understand and help determine the financial health and efficiency of the company. Previous studies highlight the role of financial ratios in general valuation, but comprehensive comparative analyses linking financial statement performance with valuation models (EBO vs. P/E vs. P/S) in sectors such as shipping remain limited.

2.9 The Effect of EBO Variables on Stock Prices

In the Earnings-Based Ownership (EBO) model, two main variables are considered: Book Value and Earnings. Earnings reflect a company's ability to generate net income from sales. The higher the earnings, the more efficient the company is in managing its costs, resulting in increased net profits. This, in turn, has a positive impact on the company's stock (Schlingemann & Stulz, 2022). Book Value represents the ratio used to measure stock price performance relative to its book value. A higher Book Value ratio indicates a higher company value. Therefore, in this model, there is a positive relationship between the Book Value and the stock price.

2.10 The Effect of Price to Earnings Variables on Stock Price/Earnings

In the Price-to-Earnings (P/E) model, there are three key variables: Earnings Growth, Payout Ratio, and Beta. This model emphasizes a company's profitability, where a higher P/E ratio indicates better company performance, as it reflects the company's ability to generate profits from its business activities (Paradiba & Nainggolan, 2015). When both the Payout Ratio and Earnings Growth are high, they positively influence the increase in stock price or earnings. Meanwhile, Beta represents the level of systematic risk inherent in a stock; therefore, Beta also has a positive relationship with stock prices or earnings.

2.11 The Effect of Price to Sales Variables on Stock Price/Sales

In the Price to Sales (PS) model, there are four independent variables: Earnings Growth, Payout Ratio, Beta, and Profit Margin. This model emphasizes a company's net profitability, reflecting its ability to generate net income from total sales. The ratio is not only used to measure earnings growth and profit

margin but also serves as a basis for determining the dividend payout ratio (Kholifah, Murdiyanto, & Rahmawati, 2023). As a company's profits increase, they tend to positively influence the rise in stock prices or sales. Therefore, the PS model demonstrates a positive relationship between these financial indicators and stock price/sales performance. Studies often show the effects of individual variables, but comparatively evaluating these effects across multiple valuation models within the same industry is still limited.

2.12 Hypothesis

Based on the literature review and identified research gaps, the following hypothesis is proposed.

H_1: The P/S model better explains stock price fluctuations in Indonesian shipping companies than the EBO and P/E models do

3. Methodology

This study utilizes quantitative data in the form of numerical figures obtained from the audited annual financial statements of companies. The data used are secondary sources derived from the annual reports of shipping companies listed on the IDX from 2018 to 2023. Data collection was conducted through a literature study by reviewing various relevant books and theories to explain the research variables, issues, and discussion, as well as by collecting data directly from the IDX as the main source. The population in this study includes all shipping companies listed on the IDX that published complete financial statements during the research period. The research instruments used in this study are described in Table 1.

Table 1. Operational definition and measurement of variables

Variables	Operational Definition	Measurement Scale
Book Value	Total equity is divided by the number of outstanding shares.	Ratio
Earning	Net profit after tax is divided by the number of outstanding shares.	Ratio
Beta	The slope of the regression line measures stock volatility.	Ratio
Price t-1	The stock price in the previous period.	Nominal
Earnings Growth	The rate of current earnings growth compared to that of the previous period.	Ratio
Payout Ratio	The proportion of profits distributed as dividends.	Ratio
Margin Profit	Net profit is divided by total sales in a specific period.	Ratio
P/Et-1	The stock price is divided by the earnings of the previous period.	Ratio
P/St-1	It is the value of the stock price divided by the total sales in the previous period.	Ratio

Table 2 presents a list of public company samples that are the research objects in the shipping sector in Indonesia. There are five companies listed on the Indonesia Stock Exchange, namely PT Pelayaran Tempuran Emas, Tbk (TMAS), PT Berlian Laju Tanker, Tbk (BLT), PT Humpuss Intermoda Transportasi, Tbk (HITS), PT Samudera Indonesia, Tbk (SMDR), and PT Pelayaran Nelly Dwi Putri, Tbk (NELLY). These five companies are key players in the national shipping industry, operating in the field of sea transportation services for domestic and international commodities. The selection of these companies as a sample was based on their status as active issuers and the availability of adequate financial data during the study period.

Table 2. Sample of public companies

No	Code	Company Names
1.	TMAS	PT. Pelayaran Tempuran Emas, Tbk
2.	BLT	PT. Berlian Laju Tanker, Tbk
3.	HITS	PT. Humpuss Intermoda trasnportasi, Tbk

4.	SMDR	PT. Samudera Indonesia, Tbk
5.	NELLY	PT Pelayaran Nelly Dwi Putri, Tbk

Although this study relies on audited annual financial statements as secondary data, potential biases may arise from several sources.

1. Reporting Bias: Companies may adopt different accounting policies or have discretionary items that could affect the comparability between firms.
2. Timeliness Bias: Annual reports reflect past performance and may not fully capture real-time market fluctuations or sudden changes in company conditions.
3. Omission or Estimation Bias: Some relevant information, such as off-balance sheet items or managerial expectations, may not be fully disclosed, potentially impacting the accuracy of the derived financial ratios.
4. Survivorship Bias: The study focuses only on companies that have continuously published complete reports, which may exclude firms that delisted or experienced financial distress.

These potential biases may influence the results by slightly over-or underestimating the explanatory power of the variables on stock prices. Nevertheless, using audited reports from the IDX ensures that the data are official, standardized, and comparable, minimizing major distortions while acknowledging inherent limitations.

4. Results and Discussions

4.1 EBO Model

The EBO model is used to examine the extent to which book value per share (book value) and Earnings per Share (EPS) influence a company's stock prices. Based on the test results using the Fixed Effects Model (FEM) approach, the regression equation is as follows:

$$Y = 1.5386X_1 - 0.1665X_2 + 12764.77 \quad (7)$$

These results indicate that book value has a positive effect on stock prices, whereas earnings have a negative effect. However, neither variable was significant individually ($p > 0.05$). Simultaneously, these two variables have a significant effect on stock prices (Prob F = 0.000), with an R^2 of 0.9999, meaning that the model can explain almost all the variations in stock prices.

Table 3. Regression analysis results EBO Model

Variables	Coefficient	Probability	Description
Book Value (X_1)	1.5386	0.3036	Not significant
Earnings (X_2)	-0.1665	0.9286	Not significant
R^2	0.9999		
Prob (F-stat)	0.0000		Significant simultaneously

Table 3 presents the regression analysis results for the EBO model. The coefficient of determination (R^2) of 0.9999 indicates that 99.99% of the variation in the dependent variable can be explained by the independent variables. While the model is statistically significant simultaneously, the extremely high R^2 suggests overfitting**,** meaning that the model may be too closely fitted to the sample data and may not generalize well to other datasets or predict future stock prices accurately. Practically, this implies that although the EBO model captures historical variations extremely well, it may overestimate the explanatory power of Book Value and Earnings and fail to reflect other market factors influencing stock prices. Therefore, investors and analysts should interpret the EBO results cautiously and consider complementary models such as P/E or P/S for more robust decision-making.

4.2 PS Model

The PS model is used to examine the effects of profit growth, profit margin, beta, payout ratio, and P/E t–1 on stock price per earnings. The regression test using the Common Effect Model (CEM) yielded the following equation:

$$Y = -18404.23X_1 + 154797.3X_2 + 13995.32X_3 + 644879.7X_4 + 0.2128X_5 - 316556.4 \quad (8)$$

The results show that profit margin (X_2) and payout ratio (X_4) have a positive and significant effect on stock prices ($p < 0.05$), whereas the other variables are not significant. The R^2 value of 0.2966 indicates that approximately 29.66% of the variation in stock prices can be explained by this model, with the remaining being influenced by factors outside the model.

Table 4. Regression analysis results PS Model

Variables	Coefficient	Probability	Description
Profit Growth (X_1)	-18404.23	0.3052	Not Significant
Profit Growth (X_2)	154797.3	0.0365	Significant
Beta (X_3)	13995.32	0.7121	Not Significant
Payout Ratio (X_4)	644879.7	0.0310	Significant
P/E t–1 (X_5)	0.2128	0.6824	Not Significant
R^2	0.2966		
Prob (F-stat)	0.0069		Significant simultaneously

Table 4 presents the results of the regression analysis, where the model is simultaneously significant (Prob F-stat = 0.0069). This means that the five independent variables have a significant influence on the dependent variable. However, partially (individually), only two variables are significant (Prob ≤ 0.05), Profit Growth (X_2) with a positive coefficient of 154797.3 (Prob. 0.0365) and Payout Ratio (X_4) with a positive coefficient of 644879.7 (Prob. 0.0310). Meanwhile, the variables Profit Growth (X_1), beta (X_3), and P/E t-1 (X_5) have no significant effect because their probability values are greater than 0.05.

4.3 PE Model

The PE model examines the effects of profit growth, payout ratio, beta, and PE t–1 on the stock price-to-earnings ratio. The regression test using the Common Effect Model (CEM) yielded the following equation:

$$Y = 6752.83X_1 + 808827.8X_2 - 21824.02X_3 + 0.3168X_4 - 119805.4 \quad (9)$$

The analysis shows that the payout ratio (X_2) and PE t–1 (X_4) has a positive and significant effect on stock prices ($p < 0.05$), while profit growth and beta are not significant. The R^2 value of 0.2222 indicates that approximately 22.22% of the variation in stock prices can be explained by this model. In conclusion, dividend policy and historical stock price factors are important indicators of shaping investors' perceptions of stock value.

Table 5. Regression analysis results PS Model

Variables	Coefficient	Probability	Description
Profit Growth (X_1)	6752.83	0.5276	Not Significant
Profit Growth (X_2)	808827.8	0.0078	Significant
Beta (X_3)	-21824.02	0.6155	Not Significant
PE t–1 (X_4)	0.3168	0.0480	Significant
R^2	0.2222		
Prob (F-stat)	0.0210		Significant simultaneously

Table 5 presents the results of the regression analysis for the PS model with four independent variables. Model PS is statistically significant simultaneously (Prob F-stat = 0.0210), and the variables Profit Growth (X_1), Profit Growth (X_2), beta (X_3), and PE t-1 (X_4) collectively influence the dependent variable. However, when tested partially, only two variables were significant ($p \leq 0.05$). Namely, the variable Profit Growth (X_2) has a probability of 0.0078 and a positive coefficient of 808827.8, as well as PE t-1 (X_4) with a probability of 0.0480 and a positive coefficient of 0.3168. Conversely, Profit Growth (X_1) and beta (X_3) are not significant in influencing the dependent variable, as their probability values exceed 0.05.

4.4 Comparison of the Performance of the Three Models

Table 6. Comparative result

Criteria	EBO	PS	PE
Selected Model	Fixed Effect	Common Effect	Common Effect
R^2	0.9999 (overfit)	0.2966	0.2222
F-Test (simultaneous)	Significant	Significant	Significant
t-Test (partial)	Not Significant	2 Variable Significant	2 Variable Significant
Classical Assumptions	Autocorrelation present	All Passed	All Passed
Empirical Realism	Weak	Good & stable	Moderate

The research results provide a comparison, shown in Table 6, of the effectiveness of three stock valuation models: Edwards-Bell-Ohlson (EBO), Price-to-Earnings (P/E), and Price-to-Sales (P/S). The comparison is made to explain the price variations in shipping company stocks listed on the Indonesian Stock Exchange during the period 2018–2023. These three models represent different analytical approaches to identify the most accurate and relevant model for reflecting company value in the Indonesian shipping sector.

4.5 Discussion

The EBO model produced a very high coefficient of determination (R^2) of 0.9999. The results of the coefficient of determination show that book value and profit together can explain almost all the variation in stock prices. This finding aligns with Chowdhury, Abdullah, and Masih (2022). The Clean Surplus Valuation theory states that book value and earnings are the two main components in determining the intrinsic value of a stock. However, the test results show that both variables are partially insignificant to stock prices ($p > 0.05$). The results indicate a strong influence of external factors, such as market sentiment, macroeconomic policies, and investor expectations, which are not fully reflected in the independent variables.

As mentioned by Ball and Brown, the market often anticipates earnings information before official financial statements are released (Darmayanti & Dientrimei, 2021). This is consistent with the findings of Abi Rafdi and Zuhri (2026). This indicates that the capital market in developing countries, such as Indonesia, is not yet fully efficient. These results prove that the EBO model tends to be overfitted, statistically strong, but practically weak. Thus, although this model is relevant to the existing theory, its application in a volatile market becomes less representative.

The Price-to-Earnings (P/E) model indicates that there are a positive and significant influence of the dividend payout ratio and the P/E ratio of the prior period, P/E t -1, on the stock prices. These findings indicate that dividend policy and market history significantly influence investors' perceptions. This confirms that the historical P/E ratio is a predictor of future stock prices. This outcome indicates the relevance of the Dividend Signalling Theory postulated by Bhattacharya, according to which an increase in the dividend payout ratio serves as a positive signal for the market regarding the possibility of a company's future profitability (Asrida, Saputra, & Pasupatri, 2024). The P/E model provides a more realistic view of the correlation between firms' policies and investors' behavior in the Indonesian capital market.

The Price-to-Sales (P/S) model became the strongest and most empirically representative model, with an R^2 of 0.2966, and the results were meaningfully significant in the simultaneous test. It was found that profit margin and payout ratio have a significant but positive influence on stock price, whereas other variables are not important. In line with the study of Marlina (2024), the P/S ratio is a more prominent element of valuation than other earnings-based ratios because it is non-manipulable. The P/S ratio is more effective in determining the efficiency of a firm in terms of earnings per share. This is justified by the results of Sumantika (2025), who opined that sales-based ratios experience fewer effects on short-term events. In line with Arshad, Latif, Salman, and Irfan (2023), profit margins are an important indicator of profitability and a decisive factor in investor confidence. Meanwhile, Firzatullah and Warastuti (2025) maintain that a high dividend payout ratio reflects a stable cash flow and sound policy of the company, making the shares more appealing in the market.

A more appropriate use of the P/S model in the shipping industry is that the business of shipping products is highly dependent on the efficiency of operations and volume of sales, and not merely on net profitability. The business is capital-intensive; hence, it is more realistic to use sales-based ratios to determine the value of the company. Overall, the EBO model is statistically better but poor in market reality based on overfitting characteristics. The P/E model can provide more balanced results as it determines the contribution of dividend policy and past ratios to the price of stocks. The P/S model represents the best balance of statistical power and realism of empiricism.

According to the Firm Value Theory, the price of a stock represents all significant information present in the market (Malkiel, 1987). Similar to the capital market of Indonesia, particularly in the highly fluctuating shipping market. The best and most representative analytical model is the P/S model, as it can reflect the actual correlation between profitability, dividend policy, and market perception. Hence, the best stock valuation model used to assess the price of a shipping business in Indonesia is the Price-to-Sales (P/S) model. In addition to advancing modern financial theory, this model has practical implications for investors, analysts, and policymakers to determine the true value of stocks and enhance the precision of investment decisions.

5. Conclusions

5.1 Conclusion

This study compares the EBO, P/E, and P/S valuation models for shipping companies listed on the Indonesia Stock Exchange (IDX) from 2018 to 2023. The EBO model showed an extremely high Adjusted R^2 (0.9999), indicating overfitting and limited predictive reliability despite its statistical strength. This suggests that book value and earnings may not fully capture the shipping sector's economic reality. The P/E model identifies the dividend payout ratio and P/E t–1 as significant determinants of stock prices, although its explanatory power remains modest ($R^2 = 0.2222$). Meanwhile, the P/S model demonstrates the most balanced performance ($R^2 = 0.2966$), with the profit margin and dividend payout ratio significantly influencing stock prices. This indicates that revenue-based valuation provides more stable signals in industries characterized by earnings volatility.

These findings support the Corporate Value Theory, which emphasizes the importance of fundamental performance in determining firm value, and are consistent with the Efficient Market Hypothesis, as market prices reflect publicly available financial information. For investors, revenue stability and dividend policies are key considerations for valuing shipping stocks. For policymakers, improving financial transparency and strengthening disclosure standards in the shipping sector may enhance market efficiency and reduce mispricing.

5.2 Research Limitations

This study focuses exclusively on shipping companies listed on the Indonesian Stock Exchange during the 2018–2023 period, which means that the results may not be directly generalizable to other industries or different time horizons with distinct market conditions. In addition, the analysis relies entirely on secondary financial statement data and market indicators, without incorporating macroeconomic variables, regulatory changes, or operational factors that could shape stock price movements and influence valuation accuracy.

5.3 Suggestions and Directions for Future Research

Future studies may extend the analysis by including longer observation periods or by comparing shipping companies across different emerging markets to examine whether the findings remain consistent. Incorporating macroeconomic variables, industry cycle indicators, or alternative valuation approaches would also be useful to provide a more comprehensive understanding of stock pricing dynamics in capital-intensive sectors.

Acknowledgement

The author would like to express sincere gratitude to Universitas Kartamulia for academic support and to colleagues who provided valuable insights and constructive feedback during the preparation of this manuscript

Author Contributions

DYM was responsible for conceptualization, research design, data collection, data analysis, interpretation of results, manuscript drafting, and final approval of the submitted version.

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