

The study of normative levels of indicators for the company's assets and capital structure

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Abstract: This study aimed to determine the normative levels of key financial ratio indicators by accounting for capital structure characteristics, addressing the lack of a unified methodology tailored to Mongolia's business sector and firm size. The study employed a quantitative empirical approach using firm-level financial data. We analyzed a total of 2,200 company samples listed on the Mongolian Stock Exchange (MSE) between 2009 and 2022. Working capital ratio and debt ratio were employed as core proxies for capital structure, while profitability indicators were used to assess financial performance. The analysis applied descriptive statistics, non-linear regression techniques, and distribution-based comparisons to examine the relationship between capital structure components and profitability. To ensure robustness, firm size, industry classification, and macroeconomic growth conditions were explicitly considered. The results showed that both the debt ratio and the working capital ratio exhibit a nonlinear relationship with profitability indicators. Profitability improves only within specific threshold ranges of capital structure, while excessive leverage or inefficient working capital allocation leads to declining financial performance. The findings further reveal that normative financial ratio levels vary significantly across industries and firm size categories. Notably, the median provides a more appropriate benchmark for normative levels than the arithmetic mean, because financial ratios exhibit asymmetric distributions and are sensitive to extreme values. These findings indicate that normative financial ratios should be determined using distribution-sensitive measures rather than simple averages. The study contributes to financial statement analysis by proposing a more realistic, sector-specific approach to defining normative benchmarks, with practical implications for financial analysts, corporate managers, and policymakers in emerging markets.

Keywords: Debt ratio, Return on capital, Normative level, Working capital, Joint stock company

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1. INTRODUCTION

In the corporate sphere, comprehending the optimal allocation of the company's assets and capital structure, and ensuring the appropriate equilibrium between debt and equity, holds paramount importance in assessing financial health indicators and fostering sustainable future growth [1]. Until now, in our country, there is no unified methodology that determines the normative level of financial ratios depending on the business sector and the size of the company. Therefore, we set the following goals with this research work:

1. Assess the normative level by representing the percentage of working capital representing the capital structure and debt ratio by representing the capital structure
2. To study the relationship between the mean and median of these indicators and the profitability indicators

The stable and profitable operation of the company yields a positive impact not only on the organization itself but also on all stakeholders, including investors, customers, and employees [2]. The primary indicators that can determine and evaluate the current financial situation of the company are the current ratio and the debt ratio. The current ratio assesses the organization's ability to meet its short-term obligations with its current assets, while the debt ratio calculates the percentage of external financing in relation to the total assets [3]. A company's survival is contingent upon working capital, which serves as a critical resource for financing and decision-making throughout the operational cycle, spanning from the procurement of raw materials to the production of final products [4]. Short-term liabilities are typically settled using the cash generated from working capital, and reducing the company's liabilities has a positive impact on financial stability and enhances liquidity [5]. Financial managers and executives prioritize determining the appropriate level of working capital and implementing optimal management methods to ensure sufficient resources and cash to cover short-term liabilities and future planned operations [6].

Establishing normative levels for specific indicators related to the company's assets and capital structure is a common practice aimed at ensuring financial stability, efficient operations, and optimal risk management [7]. These norms can vary across countries and are typically established by regulatory bodies or industry standards. Economically developed nations like the United States, the United Kingdom, and Japan rely on standard norms developed by top institutions for financial stability regulation. They evaluate changes and efficiency in reporting years for branches and organizations, using these evaluations to develop strategic policy plans for the future.

In developed countries, particularly in our nation where the profitability of companies is pivotal amid unstable economic fluctuations for economic growth and development, various regulatory frameworks are employed to ensure financial stability, transparency, and comparability of financial reports. However, unlike evaluating based solely on financial analysis and historical reports, it is challenging to establish normative levels for parameters related to capital and capital structure of companies through standard-setting organizations. Hence, there exists a challenge in establishing normative levels that enable financial comparisons based on factors such as the sector, scale of operations, and asset conditions.

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2. THEORETICAL BACKGROUND

An optimal capital structure refers to the resources a company utilizes to finance its assets, operations, and future growth, with financing sources typically encompassing debt and equity. The primary theories in this domain include Modigliani and Miller's theory, trade-off theory, and pecking order theory, all of which aim to elucidate how the departure from normativity influences a company's capital structure [8].

The study of optimal capital structure gained significant popularity following the introduction of Modigliani and Miller's theory [9]. The Modigliani and Miller theory posits that there is no distinction between the utilization of debt and equity and that the composition of a company's capital structure, whether it includes debt or equity, does not impact the firm's value. Additionally, the theory develops propositions I and II. [10]. Proposition I of Modigliani and Miller's theory discusses the impact of taxation, while Proposition II highlights that firms with higher debt financing experience a higher cost of equity capital. In essence, these propositions elucidate how debt influences both the value of a firm and the cost of equity capital. It's important to note that in a perfect market, the capital structure does not affect the firm's value, but in reality, imperfections such as taxes come into play and affect the value of the firm.

The trade-off theory posits that companies aim for an optimal capital structure that strikes a balance between the tax advantages of debt and the costs associated with debt. According to this theory, firms borrow funds until the tax benefits derived from debt outweigh the costs associated with potential financial distress. Empirical research supports this theory by showing that firms endeavor to minimize their weighted average cost of capital (WACC) through prudent management of their debt levels. [11]. Companies strive to enhance value by leveraging debt to minimize tax liabilities and augment cash flow [12]. Non-debt tax shelters provide additional tax advantages such as depreciation and diminish the necessity for debt. Research indicates that companies with greater non-debt tax shelters tend to have lower levels of leverage [13]. There is a positive correlation between the value of real assets and leverage, suggesting that real assets are more readily used as collateral for obtaining loans [14]. The capital structure of Dutch companies aligns with the trade-off theory, as it involves a careful balance between maximizing tax benefits and managing the complex costs associated with debt [15].

Excessive debt elevates the risk of financial distress, which can lead to bankruptcy and associated costs [16]. These costs encompass legal and administrative expenses as well as missed business opportunities. The fluctuation in operating income signifies business risk, with high volatility typically linked to low leverage [17]. Larger companies generally face fewer difficulty costs, making debt financing more accessible for them. It can be inferred that the leverage decisions of Dutch companies are guided by the trade-off between tax benefits and difficulty costs, which are influenced by factors like marginal tax rates and firm risk.

The Pecking Order Theory elucidates how companies prioritize their financing options, primarily due to the information asymmetry between managers and investors. This information asymmetry leads companies to favor internal financing over external financing options [18].

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When companies require external financing, they generally prefer debt issuance over equity issuance. This preference is driven by the aim to prevent undervaluation of equity, which could diminish the value of existing shareholders. Creditors, on the other hand, prioritize bankruptcy proceedings and are less concerned about the firm's valuation [19]. Hence, companies opt for financing methods that entail minimal disclosure, commencing with retained earnings, followed by debt, and ultimately equity issuance. Empirical studies substantiate the Pecking Order Theory, indicating that profitable companies prioritize internal financing over external sources [20]. Profitable companies typically have substantial retained earnings and lower leverage. Furthermore, liquidity as a percentage of total assets exhibits a negative correlation with leverage, aligning with the theory that firms prioritize internal equity over debt [21]. The Pecking Order Theory can be summarized as emphasizing the influence of information advantages on companies' financial decisions, which leads them to prioritize internal financing, particularly retained earnings, over external sources such as debt and equity issuance [22].

3. METHODOLOGY AND RESULT OF THE RESEARCH

As of March 2024, there are 173 joint-stock companies registered in the MSE. For this study, we utilized a compilation of financial statements from a total of 2,417 samples of companies that submitted their financial statements between 2009 and 2022. However, due to insufficient financial data and missing information in the statements of some joint-stock companies within this sample, we excluded them from the analysis. Ultimately, we analyzed a total of 2,200 samples to ensure data accuracy and completeness. In our study, we investigated the relationship between the working capital ratio ($ETA = \text{Current assets}/\text{total assets}$) and the debt ratio ($\text{liabilities}/\text{total assets}$) with the return on assets ($ROA = \text{Profit before interest}/\text{total assets}$) and return on equity ($\text{net profit after tax}/\text{owners' equity}$). This analysis was conducted across five sectors and different company sizes categorized by the stock exchange. Essentially, we aimed to assess the optimal capital structure of companies using the working capital ratio and debt ratio, while evaluating financial performance through return on assets and return on equity.

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[Table 1] Mean and median of indicators, 2009 to 2022

| Year | Sample | ROA | | ROE | | ETA | | DTA | |
|--------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| | | Average | Median | Average | Median | Average | Median | Average | Median |
| 2009 | 134 | 0.2% | 0.2% | -3.2% | 0.5% | 38.8% | 36.1% | 41.3% | 34.3% |
| 2010 | 92 | 2.0% | 1.1% | 5.2% | 2.8% | 37.6% | 34.0% | 37.5% | 30.8% |
| 2011 | 181 | 0.9% | 0.5% | 0.2% | 0.9% | 39.3% | 36.8% | 44.5% | 32.5% |
| 2012 | 195 | 0.6% | 0.4% | 10.3% | 0.8% | 37.8% | 34.9% | 50.3% | 33.9% |
| 2013 | 194 | -0.4% | 0.1% | 1.5% | 0.4% | 37.4% | 30.5% | 49.3% | 33.5% |
| 2014 | 189 | -1.7% | 0.0% | 2.2% | 0.0% | 37.9% | 31.6% | 51.1% | 38.0% |
| 2015 | 118 | -2.3% | 0.0% | 5.0% | 0.2% | 37.3% | 31.0% | 48.6% | 35.3% |
| 2016 | 176 | -1.7% | 0.0% | 3.1% | 0.2% | 38.5% | 29.5% | 48.2% | 33.1% |
| 2017 | 164 | -1.0% | 0.0% | 0.0% | 0.5% | 36.3% | 28.0% | 49.1% | 31.3% |
| 2018 | 166 | 0.0% | 0.0% | 0.6% | 0.8% | 38.0% | 31.6% | 56.2% | 35.7% |
| 2019 | 158 | -0.4% | 0.1% | 5.4% | 0.6% | 39.7% | 33.0% | 52.4% | 31.2% |
| 2020 | 151 | -0.9% | 0.0% | 7.3% | 0.3% | 37.7% | 31.4% | 50.0% | 32.5% |
| 2021 | 148 | -0.2% | 0.0% | 3.5% | 0.6% | 40.9% | 35.6% | 51.0% | 33.3% |
| 2022 | 134 | 0.7% | 0.0% | 10.5% | 1.1% | 39.7% | 30.1% | 63.7% | 38.0% |
| Дундаж | | -0.35% | 0.08% | 3.61% | 0.56% | 38.31% | 32.45% | 49.80% | 33.68% |

Source. Researcher's estimation

The mean and median values of the financial ratios studied exhibit significant differences from 2009 to 2022 in show table 1. This variability in the normative level of each financial indicator is attributed to fluctuations in economic growth, market conditions, and numerous external and internal factors impacting the company, such as exchange rates, inflation, and loan interest rates. Additionally, notable discrepancies exist between the mean and median values of the ratios. For instance, the average return on equity (ROE) across the entire sample stands at 13.61 percent, while the median value is 0.56 percent. Notably, there are substantial differences observed in the years 2012, 2019, and 2022, indicating considerable variations in other indicators as well.

The MSE has categorized its registered joint-stock companies into five main sectors: processing (Sector A), manufacturing (Sector B), food and agriculture (Sector C), transportation (Sector D), and trading services (Sector E). Below are the mean and median values of the ratios for these sectors:

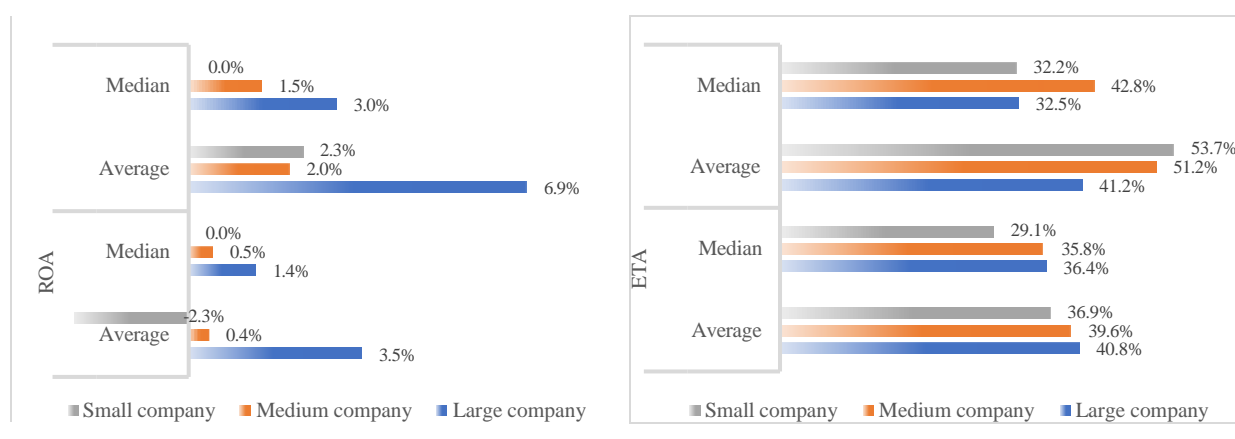
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[Table 2] Industry mean and median for each indicator, 2009 to 2022

| Sector | Sample | ROA | | ROE | | ETA | | DTA | |
|--------|--------|---------|--------|---------|--------|---------|--------|---------|--------|
| | | Average | Median | Average | Median | Average | Median | Average | Median |
| A | 408 | -0.6% | 0.0% | 8.4% | 0.8% | 38.9% | 36.0% | 59.0% | 45.4% |
| B | 494 | 2.3% | 0.4% | 5.0% | 1.4% | 43.1% | 40.2% | 51.0% | 43.4% |
| C | 309 | -2.1% | 0.0% | 5.2% | 0.5% | 35.3% | 29.0% | 59.8% | 45.4% |
| D | 579 | -0.7% | 0.1% | 1.9% | 0.3% | 34.2% | 24.4% | 36.4% | 21.8% |
| E | 410 | -1.5% | 0.0% | -1.6% | 0.1% | 40.0% | 28.9% | 50.6% | 29.8% |

Source. Researcher's estimation

The mean and median values of the indicators also exhibit significant variations across sectors and even within each sector in table 2. For instance, in Industry A, the average return on equity (ROE) is 8.4 percent, while the median is 0.8 percent. This discrepancy indicates that while the average ROE for companies in this sector is 8.4 percent, half of the total sample has a return below 0.8 percent. The increase in the industry average is primarily attributed to the exceptional performance of a few companies in the sector with extremely high returns on equity. When ranked based on profitability, Sector B emerges as the most profitable, whereas Sector E ranks as the least profitable. In terms of working capital percentage, Sector D has the lowest figure at approximately 24%, whereas Sector B boasts the highest percentage at 40.2%. Sectors D and E exhibit the lowest debt ratios, with liabilities accounting for less than 30% of total assets, while Sectors A and C have relatively higher reliance on external capital.

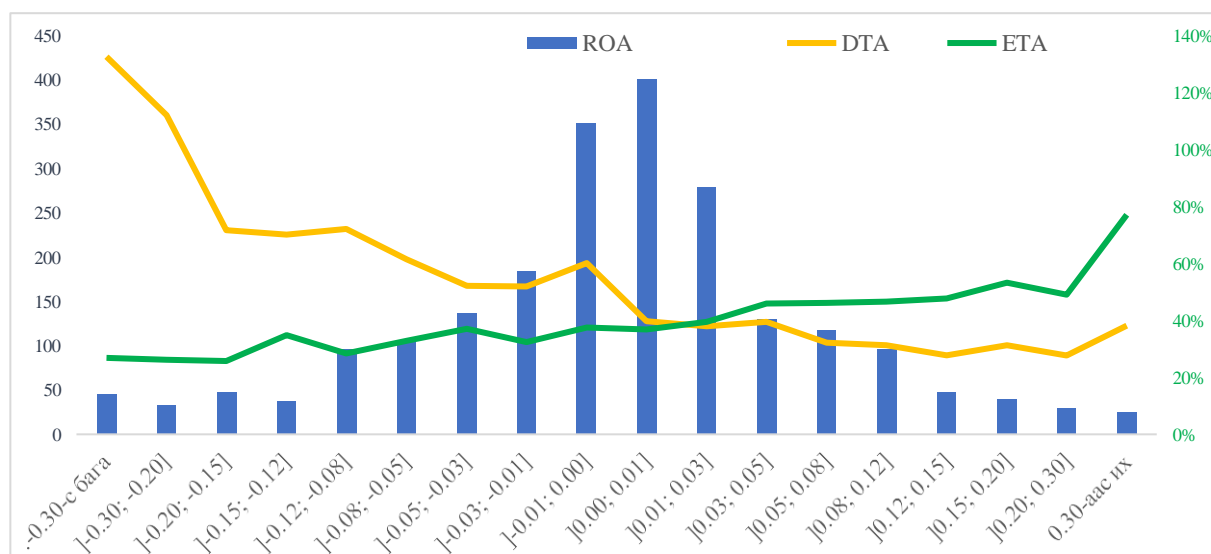


[Figure 1] Mean and median for each indicator, by company size

The graph presented above illustrates the average and median values of the indicators based on company size, as per the Minister of Finance's Order No. 2016.02. According to the Law on Non-profit Organizations, approved under Order No. 41 dated 3.4, enterprises

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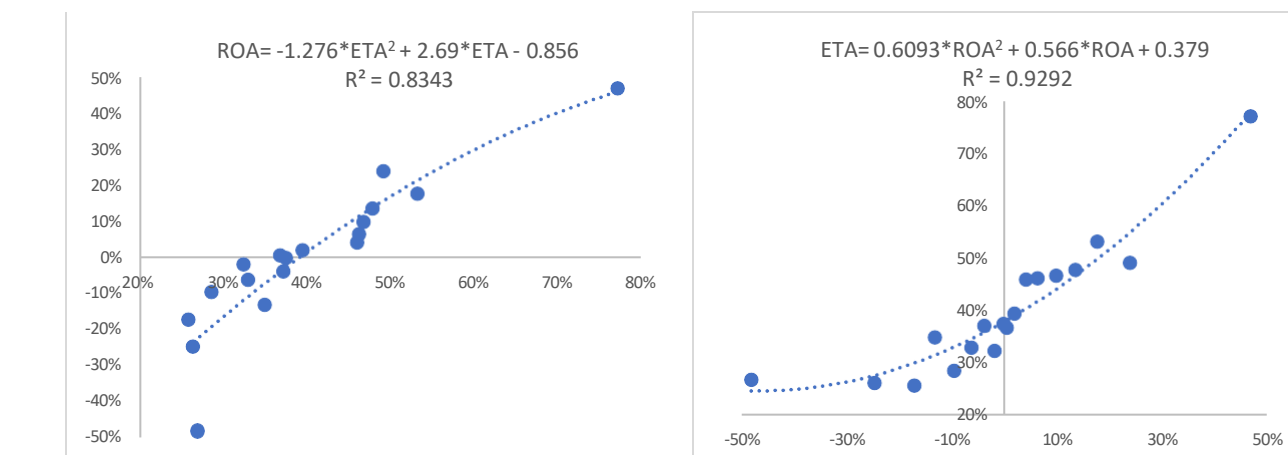
are classified as large if their total sales amount exceeds 1.5 billion MNT; otherwise, they are categorized as small or medium enterprises. However, with the enactment of the Law on Support of SMEs and Services in 2019, the classification criteria have been revised. Under this new law, enterprises with sales revenue up to 300 million are classified as micro, those with revenue between 300 million and 1 billion as small, those with revenue between 1 billion and 2.5 billion as medium, and those with revenue exceeding 2.5 billion as large. The average return on equity for large enterprises is 3percent, with a median of 6.9 percent. In contrast, small enterprises have an average return on equity of 2.3 percent, with a median of 0 percent. This indicates that the profitability of large enterprises surpasses that of small and medium enterprises. Additionally, as the size or sales income of an enterprise increases, the proportion of current assets in its portfolio also increases, while the percentage of liabilities in total assets decreases.



[Figure 2] Histogram of ROA and ETA, DTA correlation

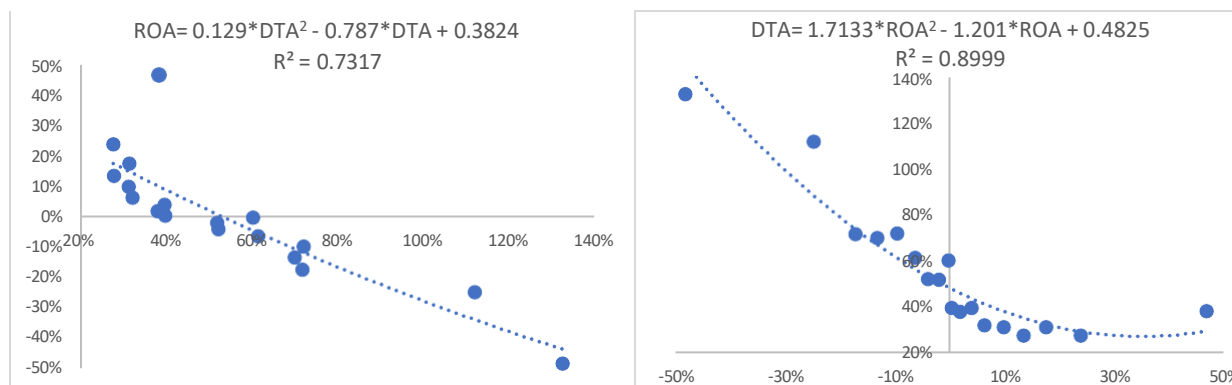
The relationship observed in the study indicates that as the ETA (working capital ratio) of surveyed public companies increases, so does the ROA (return on assets). Conversely, a lower DTA (debt ratio) is associated with a higher ROA. Specifically, a higher working capital to total assets ratio or a lower liabilities to total assets ratio corresponds to a higher return on equity. However, it's important to note that this relationship is non-linear and follows a quadratic function rather than a linear one.

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[Figure 3] Nonlinear relationship between ROA and ETA

The coefficient of determination for the non-linear relationship between Return on Assets (ROA) and the Working Capital Ratio (ETA) is 83.4%, whereas it is 73.2% for the non-linear relationship with the Debt Ratio (DTA). Conversely, the coefficient of determination for the non-linear relationship between ROA and ETA is 92.9%, and 89.9% for DTA.



[Figure 4] Nonlinear relationship between ROA and DTA

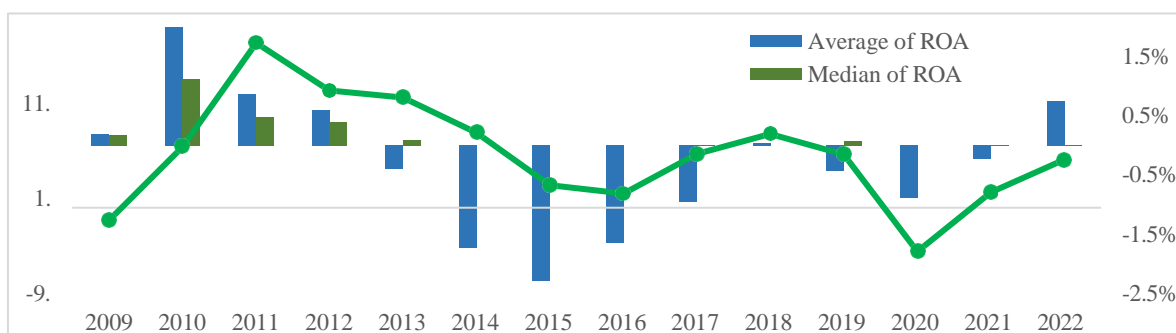
The correlation between Return on Assets (ROA) and the Working Capital Ratio (ETA) based on company size was 57.6 percent, and -42.8 percent for the correlation between ROA and the Debt Ratio (DTA) in table 3. It was observed that as the size (annual sales revenue) of the company increased, the Return on Total Assets also increased. It includes:

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[Table 3] Mean and median of financial ratios by company size

| Company size | ROA | | ROE | | ETA | | DTA | |
|----------------|---------|--------|---------|--------|---------|--------|---------|--------|
| | Average | Median | Average | Median | Average | Median | Average | Median |
| Large company | 3.5% | 1.4% | 6.9% | 3.0% | 40.8% | 36.4% | 41.2% | 32.5% |
| Medium company | 0.4% | 0.5% | 2.0% | 1.5% | 39.6% | 35.8% | 51.2% | 42.8% |
| Small company | -2.3% | 0.0% | 2.3% | 0.0% | 36.9% | 29.1% | 53.7% | 32.2% |

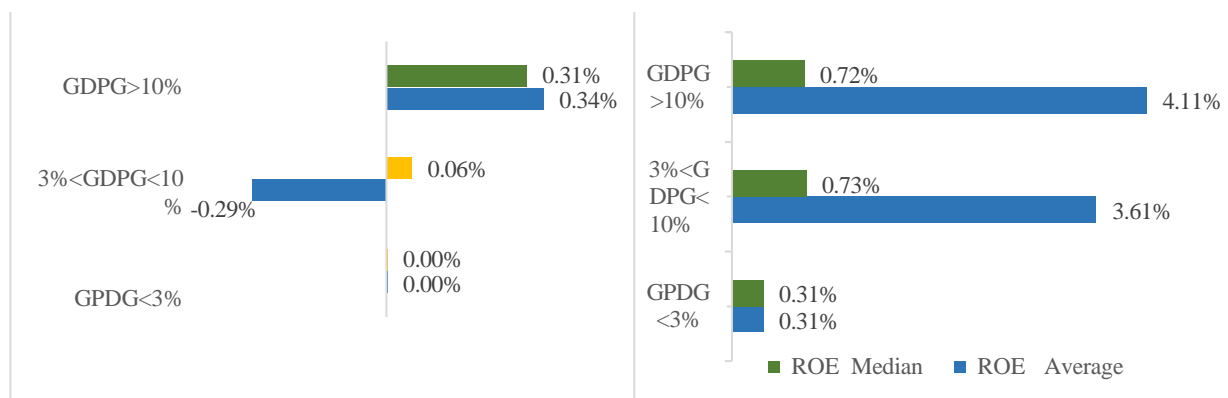
A positive and robust correlation is evident between real GDP or economic growth and the total current assets of public companies. This indicates that economic growth tends to be higher during years when the average and median return on capital of surveyed joint-stock companies is also high. It includes:



[Figure 5] Economic growth and return on capital (average and median)

In years characterized by GDP growth (GDPG) or economic growth below 3% (2009, 2015, 2016, 2020, 2021), the mean and median Return on Equity (ROE) is 0.31%. Conversely, during years when GDPG ranges between 3% and 10% (2010, 2014, 2017-2019, 2022), the average ROE is 3.61% with a median of 0.73%. In contrast, in years with GDPG exceeding 10% (2011-2013), the average ROE stands at 4.11% with a median of 0.31%. It includes:

[Figure 6] Normative level of profitability depending on economic growth



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Economic growth serves as a primary driver for the rise in profits and income of companies. However, it's worth noting that the increase in profits and income of companies can also contribute to economic growth. In this context, the relationship between economic growth and the profitability of companies listed in the BSE was assessed using Granger's test [23] with a lag order set to 1. It includes:

[Table 4] Granger causality test results (lags-1)

| Pairwise Granger Causality Tests | | Sampe: 2009-2022 | | |
|----------------------------------|---------------------------------|------------------|-------------|--------|
| | Null Hypothesis: | Obs | F-Statistic | Prob. |
| ROE $\bar{\alpha}$ GDPG | GDPG does not Granger Cause ROA | 13 | 1.10060 | 0.3188 |
| | ROA does not Granger Cause GDPG | | 11.5782 | 0.0067 |
| | Null Hypothesis: | Obs | F-Statistic | Prob. |
| ROE $\bar{\alpha}$ GDPG | GDPG does not Granger Cause ROE | 13 | 2.23902 | 0.1654 |
| | ROE does not Granger Cause GDPG | | 9.14651 | 0.0128 |

The Granger test results indicate that Gross Domestic Product Growth (GDPG) table 4 is not Granger causal to Return on Assets (ROA) and Return on Equity (ROE). However, ROA and ROE are Granger causal to GDPG at a significance level exceeding 95%. This implies that the profitability indicators of companies are not dependent on economic growth, but rather, economic growth is influenced by the profitability indicators of companies. Finally, we evaluated the effects of ROA and ROE on economic growth using the Least Squares method, and the estimation results were found to be statistically significant. It includes:

$$\text{GDPG} = 3.71208955224 + 13.4053482587 \cdot \text{ROA}(-1) \quad R^2 = 0.598872$$

t-stat 3.121617*** 4.052493***

$$\text{GDPG} = 2.47714930925 + 5.60779755579 \cdot \text{ROE}(-1) \quad R^2 = 490633$$

t-stat 1.530099 3.255060***

4. CONCLUSION

In this study, our objective was to ascertain the principal financial ratios of joint-stock companies registered in the MSE, specifically focusing on the percentage of working capital and the normative level of the debt ratio, alongside examining their correlation with profitability indicators. Our findings led to the following conclusions. It includes:

Given the significant disparity between the average and median values of financial ratio indicators among joint-stock companies, it is advisable to utilize the median value instead

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of the average value when determining financial ratios and the normative level of the industry. This approach will yield a more realistic assessment and conclusion.

The normative values of financial ratio indicators for companies fluctuate annually, influenced by industry characteristics and company size. Given their dependence on numerous environmental factors, it is suitable to establish the normative level of financial ratios for each economic cycle, industry, and company size.

The normative values of financial ratio indicators for companies fluctuate annually, influenced by industry characteristics and company size. Given their dependence on numerous environmental factors, it is suitable to establish the normative level of financial ratios for each economic cycle, industry, and company size.

As the size of the company increases, there is an increase in both the percentage of profitability and working capital, accompanied by a decrease in the debt ratio. For instance, if the debt ratio of large companies is 41.2%, medium-sized companies are at 51.2%, and small companies are at 53.7%, it can be inferred that the normative level is being met.

The profitability indicators of companies exhibit a positive non-linear relationship with the percentage of working capital and a negative non-linear relationship with the debt ratio. It is observed that profitability decreases up to a certain level of turnover ratio and debt ratio, but it begins to increase again beyond that level.

In years characterized by high economic growth, the average and median profitability indicators of joint-stock companies also exhibit elevated levels. However, economic growth itself does not directly cause an increase in the profitability of companies; instead, there is a notable correlation where economic growth experiences a significant change one year after the profitability of companies increases. For instance, if the median value of return on assets (ROA) for companies rises by 0.1 points, economic growth sees an increase of 1.34 percent after one year. Moreover, when economic growth is below 3%, the average Return on Equity (ROE) stands at 4.11%; within the range of 3 to 10 percent economic growth, the average ROE is 3.61%; and for economic growth exceeding 10 percent, the average ROE rises to 4.11%.

To enhance this study, it is recommended to establish the normative level of other financial ratios not initially included. Additionally, investigating the relationship between inflation rates, interest rates, and other macroeconomic indicators besides economic growth would provide valuable insights.

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APPENDIX

Appendix 1. The relationship between economic growth and ROA

Dependent Variable: GDPG

Method: Least Squares

Date: 03/19/24 Time: 14:38

Sample (adjusted): 2010 2022

Included observations: 13 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 3.712090 | 1.189156 | 3.121617 | 0.0097 |
| ROA (-1) | 13.40535 | 3.307926 | 4.052493 | 0.0019 |
| R-squared | 0.598872 | Mean dependent var | | 6.186923 |
| Adjusted R-squared | 0.562406 | S.D. dependent var | | 5.561496 |
| S.E. of regression | 3.678978 | Akaike info criterion | | 5.583785 |
| Sum squared resid | 148.8836 | Schwarz criterion | | 5.670700 |
| Log likelihood | -34.29460 | Hannan-Quinn critter. | | 5.565920 |
| F-statistic | 16.42270 | Durbin-Watson stat | | 1.731750 |
| Prob(F-statistic) | 0.001907 | | | |

Appendix 2. The relationship between economic growth and ROA

Dependent Variable: GDPG

Method: Least Squares

Date: 03/19/24 Time: 14:38

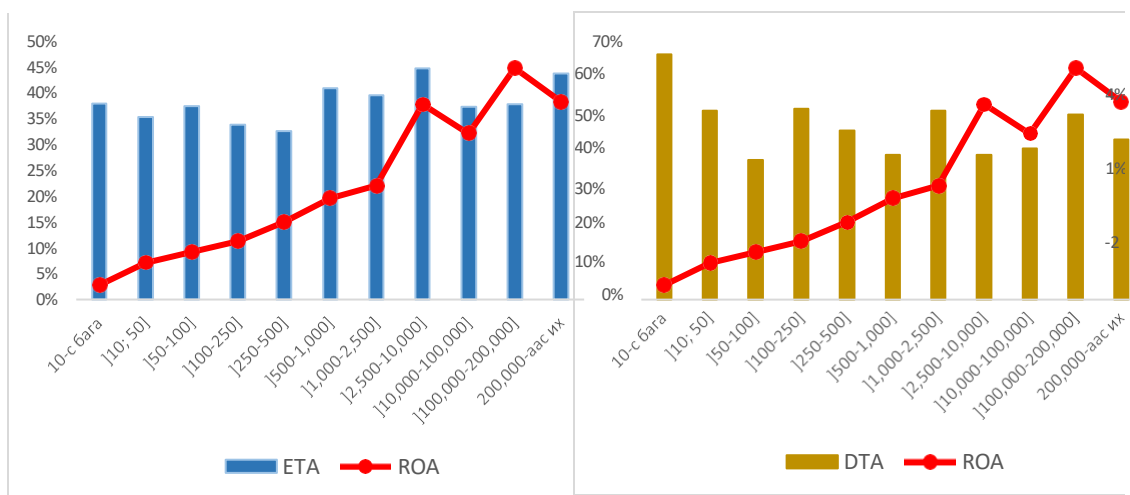
Sample (adjusted): 2010 2022

Included observations: 13 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|--------------------|-------------|-----------------------|-------------|----------|
| C | 2.477149 | 1.618947 | 1.530099 | 0.1542 |
| ROE (-1) | 5.607798 | 1.722794 | 3.255060 | 0.0077 |
| R-squared | 0.490633 | Mean dependent var | | 6.186923 |
| Adjusted R-squared | 0.444326 | S.D. dependent var | | 5.561496 |
| S.E. of regression | 4.145735 | Akaike info criterion | | 5.822675 |
| Sum squared resid | 189.0583 | Schwarz criterion | | 5.909591 |
| Log likelihood | -35.84739 | Hannan-Quinn critter. | | 5.804810 |
| F-statistic | 10.59541 | Durbin-Watson stat | | 1.232872 |
| Prob(F-statistic) | 0.007666 | | | |

The study of normative levels of indicators for the company's assets and capital structure


Appendix 3. Average ROA by company size




The study of normative levels of indicators for the company's assets and capital structure

AUTHOR'S INTRODUCTION

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