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EVALUATING COMPETITIVENESS ACROSS PUBLICLY LISTED COMPANIES USING KEY FINANCIAL METRICS: A DATA-DRIVEN APPROACH

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Abstract:

In an increasingly competitive global marketplace, assessing corporate competitiveness through financial metrics is vital for investors, analysts, and policymakers. This study proposes a structured, data-driven framework to evaluate the competitiveness of publicly listed companies using key financial indicators. Specifically, it examines revenue, earnings, net profit margin, price-to-earnings (P/E) ratio, price-to-sales (P/S) ratio, earnings per share (EPS), earnings yield (EY), and dividend yield (DY). Data were sourced from a global dataset of 9,912 firms, refined to 4,256 companies post-cleaning. The study employed benchmarking via median and interquartile range (IQR) analysis to mitigate outlier distortion, classify company performance, and enable fair cross-comparison across firm sizes and sectors. Findings highlight strong correlations between revenue and earnings, and between P/E and P/S ratios, whereas relationships among EPS, EY, and DY were weaker. Diagnostic charts and comparative analysis revealed that large-cap and mid-cap firms typically outperformed smaller firms, though no single metric could holistically define competitiveness. Only two companies—BAWAN Group and Samsung Electro-Mechanics—met the refined criteria for high competitiveness across multiple metrics. This research contributes a replicable benchmarking methodology that integrates statistical and visual analytics to support informed investment decisions. It also addresses gaps in comparative financial assessment frameworks, especially for emerging markets. Future studies are encouraged to expand the dataset temporally and sectorally to further refine the model and enhance predictive utility.

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Keywords:

Financial Performance Benchmarking; Corporate Competitiveness; Valuation Ratios; Data-Driven Financial Analysis

Introduction

In an era where economies are becoming increasingly interconnected, corporate survival is no longer guaranteed by past successes. The ability to adapt, innovate, and maintain financial resilience has become the defining factor in determining whether a firm thrives or fades into irrelevance (Gue et al., 2023; Porter, 2021). Companies must continuously optimize their financial strategies to remain competitive, especially in an era marked by rapid technological advancements, shifting market dynamics, and increasing regulatory pressures (Brynjolfsson & McAfee, 2022).

The financial landscape has evolved significantly over the past decade, with factors such as digital transformation, sustainability initiatives, and geopolitical tensions reshaping business competitiveness (World Economic Forum, 2023). Companies that strategically leverage financial data, optimize capital structures, and maintain strong financial ratios tend to outperform their peers. However, measuring competitiveness remains challenging due to variations in industry benchmarks, financial reporting standards, and macroeconomic conditions (Shiller, 2020).

In the regional context, corporate competitiveness is influenced by economic structures, financial regulations, and industry-specific factors. In Asia, for instance, countries like China and India are witnessing a surge in digital finance, enabling firms to scale operations efficiently (Zhao et al., 2023). Meanwhile, in Europe, stricter regulations on corporate governance and sustainability reporting are shaping financial strategies, with firms focusing on compliance-driven competitiveness (OECD, 2023). Emerging markets face distinct challenges such as capital access constraints, volatility in currency markets, and reliance on foreign investments (IMF, 2022). Understanding these variations is critical for benchmarking competitiveness effectively across different regions.

At the national level, Malaysia's corporate sector is undergoing rapid transformations driven by government-led financial initiatives and digitalization. The Malaysian government has introduced policies such as the Capital Market Masterplan to enhance financial transparency and investor confidence (Securities Commission Malaysia, 2023). However, despite these measures, many publicly listed companies struggle with financial inefficiencies, inconsistent profitability, and market volatility. The local financial ecosystem presents both opportunities and risks, necessitating a structured approach to assessing corporate competitiveness.

The challenge of evaluating corporate competitiveness stems from an overreliance on traditional financial metrics, often analyzed in isolation. Many studies focus on qualitative aspects such as leadership, innovation, and corporate strategy (Barney, 2022), but lack a data-driven, empirical approach to assessing competitiveness. Additionally, existing financial benchmarking models are primarily designed for developed markets and may not capture the nuances of emerging economies like Malaysia (Ali et al., 2023).

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A key issue is the inconsistent use of financial indicators across industries, making comparative assessments difficult. Investors, policymakers, and corporate leaders lack a standardized framework for evaluating financial health and long-term sustainability. Addressing this gap requires a holistic analysis of financial ratios that can provide actionable insights into corporate competitiveness. Existing research on corporate competitiveness largely focuses on qualitative attributes such as strategic management and market positioning, neglecting the quantitative role of financial metrics (Johnson & Smith, 2023). While financial ratio analysis has been extensively used in firm valuation, studies often lack a comprehensive integration of multiple financial indicators to provide a holistic competitiveness assessment.

Previous studies have explored various facets of competitiveness. Research on leadership, innovation, and qualitative competitiveness factors has established the importance of managerial decisions and corporate culture in shaping firm success (Porter & Kramer, 2019). Financial performance assessments have primarily focused on individual metrics such as profitability or liquidity, rather than a comprehensive evaluation of competitiveness (Kaplan & Norton, 2020). Additionally, while machine learning applications in financial forecasting have gained traction, there is limited focus on their use in corporate benchmarking (Gu, Kelly, & Xiu, 2021).

However, there are critical gaps that remain unaddressed. There is a lack of a structured, industry-wide analysis of financial ratios and competitiveness that integrates different financial indicators into a cohesive framework. Existing models do not provide a standardized methodology that incorporates profitability, leverage, and efficiency metrics to assess firm competitiveness holistically. Moreover, few studies have focused on financial sustainability and competitiveness in emerging markets, particularly within the context of Malaysia and Southeast Asia (Ng, Teo, & Lee, 2022).

By addressing these gaps, this research aims to develop a data-driven framework that integrates financial indicators to evaluate corporate competitiveness across publicly listed firms. This study seeks to explore: How can a structured financial performance framework be developed to assess and benchmark corporate competitiveness across industries? This study aims to develop a quantitative framework for assessing corporate competitiveness using key financial metrics. The objectives are as follows:

a) Identify the most critical financial indicators that influence firm competitiveness.
b) Develop a structured methodology for financial performance benchmarking.
c) Analyze industry-specific variations in financial metrics and their impact on competitiveness.

This study contributes to financial management and investment analysis by offering a structured approach to measuring competitiveness. It provides investors with a comprehensive framework to assess corporate financial health, allowing for better decision-making in capital allocation. For corporate executives, the study offers insights into optimizing financial strategies to enhance long-term growth and market resilience. Policymakers can leverage the findings to refine corporate governance regulations and improve financial reporting standards, fostering a more transparent and competitive business environment. Ultimately, the research enhances industry-wide understanding of financial competitiveness, bridging the gap between theory and practical financial decision-making.

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Literature Review

Evaluating corporate competitiveness has long been a central concern for businesses, policymakers, and investors. Financial performance indicators play a crucial role in understanding firm-level competitiveness, investment potential, and sustainability in the market (Srivastava, 2022). Traditionally, financial analysis has relied on key metrics such as revenue, net profit margin, price-to-earnings (P/E) ratio, and earnings per share (EPS) to assess a company's market position. However, financial indicators must be analyzed holistically to ensure an accurate representation of competitiveness (Ježovita, 2015).

Financial Metrics as Indicators of Competitiveness

Financial metrics are fundamental to assessing a company's operational efficiency, profitability, and market value. Several key metrics have been widely used in financial literature, including profitability ratios, valuation ratios, and market-based indicators (Bull & CIMA Publishing, 2008).

Profitability Ratios

Profitability ratios, such as net profit margin, return on assets (ROA), and return on equity (ROE), measure a firm's ability to generate profit relative to revenue, assets, or shareholder equity. These ratios are crucial for determining a company's financial health and ability to sustain operations over time (Rashid, 2018). Studies have found that firms with higher profitability ratios tend to have better investor confidence and long-term growth potential (Kaplan & Norton, 2020). However, these ratios may vary significantly across industries and company sizes, leading to potential distortions in competitiveness assessments (Nadar & Wadhwa, 2019).

Valuation Ratios

Valuation ratios, such as the P/E ratio and price-to-sales (P/S) ratio, provide insights into how investors perceive a company's financial performance. The P/E ratio is commonly used to assess expected growth potential, with higher ratios typically indicating strong investor confidence in future earnings (Hermuningsih & Universitas Sarjanawiyata Tamansiswa, 2019). However, excessive reliance on valuation ratios can lead to misinterpretations, especially in periods of market volatility or speculative investment trends (Gu, Kelly, & Xiu, 2021).

Market-Based Indicators

Market-based indicators, such as earnings yield (EY) and dividend yield (DY), reflect investor preferences and stock performance. Companies with high EY tend to offer better returns for investors, while DY indicates a firm's commitment to distributing profits to shareholders (Vipond, 2023). However, studies suggest that dividend policies differ significantly across sectors, making direct comparisons challenging (Ježovita, 2015).

Limitations of Relying on a Single Financial Metric

Several studies highlight the risks associated with relying on a single financial metric for assessing firm competitiveness. The relationship between financial indicators is often complex, with certain metrics exhibiting inverse correlations. For instance, firms with high revenue growth may have lower net profit margins due to expansion costs, while companies with high EPS may not necessarily be market leaders in revenue generation (Delgado et al., 2012).

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Empirical research suggests that overreliance on a single metric, such as the P/E ratio, can lead to biased investment decisions. Investors focusing solely on P/E ratios may overlook critical factors such as liquidity, leverage, and operational efficiency (Kaplan & Norton, 2020). Furthermore, Rashid (2018) found that firms with inflated P/E ratios often experience corrections in market valuation, reinforcing the need for a multidimensional approach.

Influence of Firm Size on Financial Performance

Firm size significantly affects financial performance and competitiveness. Market capitalization is often used as a measure of firm size, categorizing companies into large-cap, mid-cap, and small-cap firms (Anita, Didin, & Nurullaili, 2022). Studies indicate that large-cap firms generally exhibit higher revenue and earnings due to economies of scale, better market access, and stronger brand positioning (Hermuningsih & Universitas Sarjanawiyata Tamansiswa, 2019). Conversely, small-cap firms tend to have higher growth potential but face challenges related to capital constraints and market penetration (Akben-Selcuk, 2016).

A study by Nadar & Wadhwa (2019) showed that financial ratios differ significantly across firm sizes. Large firms often report lower net profit margins due to higher operational costs, whereas small firms may struggle with financial volatility but exhibit stronger earnings growth. This suggests that firm size should be considered when analyzing financial performance.

Benchmarking Approaches in Financial Performance Analysis

Benchmarking financial performance is crucial for evaluating competitiveness across firms. Traditional benchmarking methods rely on industry averages, historical performance, and financial ratios. However, recent advancements in data analytics have introduced new approaches, such as interquartile range (IQR) analysis and machine learning models for corporate benchmarking (Gu, Kelly, & Xiu, 2021).

Use of Median and IQR for Benchmarking

The median and IQR provide robust measures for comparing financial performance across firms. Unlike simple averages, these measures reduce the impact of extreme values and outliers, offering a more reliable benchmark (Verlag, 2013). Median-based benchmarking is particularly useful when analyzing firms of different sizes, as it minimizes distortions caused by large corporations dominating industry-wide statistics (Falciola et al., 2020).

Machine Learning in Financial Benchmarking

Emerging research suggests that machine learning models can enhance financial benchmarking by identifying patterns in financial data and predicting firm performance more accurately (Gu, Kelly, & Xiu, 2021). Algorithms such as random forests and neural networks can process vast datasets to detect financial trends, improving the accuracy of competitiveness assessments.

Research Gap

While prior studies have extensively examined financial ratios and firm competitiveness, several gaps remain. First, limited research has focused on integrating multiple financial metrics into a single competitiveness framework. Most studies analyze individual ratios rather than a comprehensive multi-metric assessment. Second, there is a lack of standardized benchmarking frameworks for evaluating firms across different sizes and industries (Ng, Teo, & Lee, 2022). Third, studies have not fully explored the role of machine learning in corporate

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benchmarking, which presents an opportunity for more data-driven competitiveness assessments.

Financial metrics are essential for evaluating corporate competitiveness, but relying on a single indicator is insufficient. A comprehensive assessment requires integrating profitability, valuation, and market-based metrics while considering firm size and industry-specific dynamics. The use of benchmarking techniques, including median and IQR analysis, enhances the accuracy of financial assessments. However, gaps in research highlight the need for standardized multi-metric frameworks and the integration of advanced analytical methods for corporate benchmarking. Addressing these gaps will contribute to more effective competitiveness evaluations and investment decision-making.

Research Methodology

Introduction

This study aims to develop a structured financial performance framework to assess corporate competitiveness, aligning with the research objectives outlined in Introduction. Specifically, the study seeks to (i) identify critical financial indicators that influence firm competitiveness, (ii) establish a systematic benchmarking methodology, and (iii) analyze industry-specific variations.

To address the first objective, this study examines key financial indicators such as revenue, earnings, dividend yield (DY), price-to-earnings (P/E) ratio, and market capitalization, which are widely used to evaluate financial performance and competitiveness (Ježovita, 2015). To address the second objective this study employs a benchmarking methodology that incorporates median analysis and interquartile range (IQR) to create a structured financial assessment framework (Vipond, 2023). The third objective is addressed by analyzing variations across industries, distinguishing between large-cap and small-cap firms, and identifying financial trends based on firm characteristics (Nadar & Wadhwa, 2019).

A data-driven approach is adopted, integrating benchmarking, comparative analysis, and diagnostic charting to offer a comprehensive evaluation of corporate financial performance. The methodology ensures that the analysis is structured, transparent, and capable of producing meaningful insights into financial competitiveness.

Data Sources

The dataset used in this study is sourced from Kaggle, which compiles financial data from CompaniesMarketCap.com, a widely used repository of global company financials. The dataset consists of financial information for 9,912 publicly listed companies worldwide, covering key financial indicators such as revenue, earnings, dividend yield (DY), price-to-earnings (P/E) ratio, and market capitalization. These financial metrics are widely used by investors and analysts to assess corporate performance and investment potential (Ježovita, 2015). The dataset provides a broad spectrum of industries and company sizes, making it suitable for comparative benchmarking across different markets (Bull & CIMA Publishing, 2008).

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Data Cleaning and Preprocessing

To ensure data accuracy and reliability, a structured preprocessing approach was applied using Python and Power BI. The dataset was imported into Power BI Desktop, where data transformation was performed through the Power Query Editor. Financial metrics, including revenue, earnings, DY, P/E ratio, and market capitalization, were merged into a single table to facilitate consolidated analysis (Gu, Kelly, & Xiu, 2021). Handling missing and zero values was an essential preprocessing step. Rows with missing values and zero balances were identified using Power BI's column profiling feature. Blank or null values were removed to prevent distortions in financial benchmarking (Rashid, 2018). Duplicate entries were also detected and removed to avoid redundancy. Additionally, erroneous values, such as negative revenues where not applicable, were corrected to maintain data integrity (Delgado et al., 2012).

To enhance the quality of the dataset, derived financial metrics such as net profit margin, earnings yield (EY), price-to-sales (P/S) ratio, and earnings per share (EPS) were calculated based on existing financial data. These computed metrics provided a more detailed view of financial performance (Hermuningsih & Universitas Sarjanawiyata Tamansiswa, 2019). Benchmarking indicators, including the median and interquartile range (IQR), were computed using Python to establish industry benchmarks. The 1.5× IQR rule was applied to detect outliers and ensure fair comparisons across firms (Verlag, 2013). Firms were then categorized based on geographic region, company size, and performance segments to enable structured competitiveness assessments (Ng, Teo, & Lee, 2022).

The datasets ware classified into continent, company sizes and performance grouping based on its categorical variable once the data preprocessing steps are completed.

a) Continent: Financial performance across regional can be evaluated by grouping them into “Continent” based on their country and its geographic for regional comparisons (Figure 1).

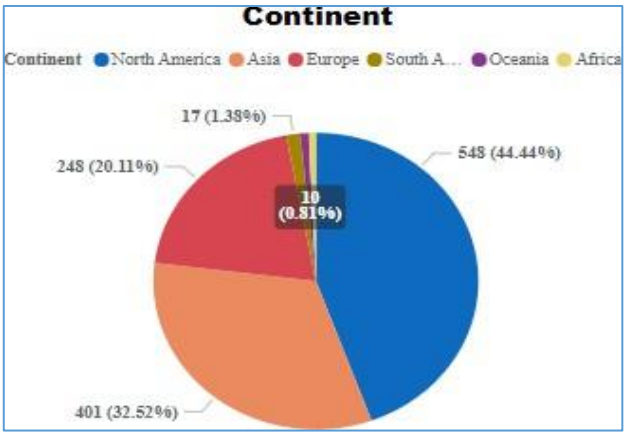

Figure 1. Countries By Continent

b) Company size: The companies is grouped based on their market capitalization in the capital market and subsequently categorized it into the following groups for performance analysis across different company scales (Figure 2)

(i) Mirco-cap: Less than £50million

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(ii) Small-cap: Between £50million to £350million
(iii) Mid-cap: Between £350million to £2.5billion
(iv) Large-cap: More than £2.5billion

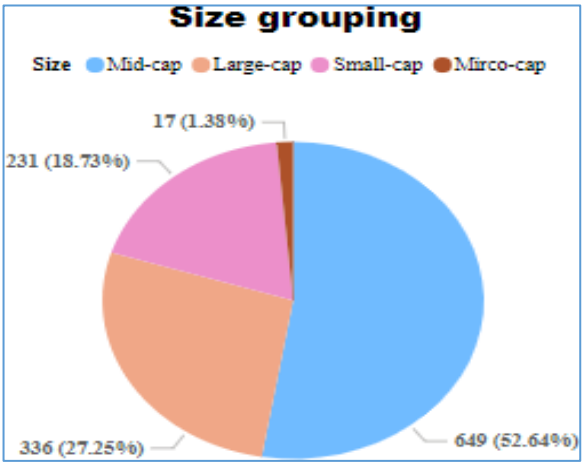

Figure 2: Countries By Company Sizes

c) Performance grouping: Each of the financial metrics is classify into one of the three groups based on its value relative to median and IQR:
(v) High: Values that exceed the upper bound of the normal range. The upper bound is determined using the Q3 and the IQR which capture the middle 50% of the data.
(vi) Average: Values lies within the normal range, which is the middle 50% of the data. Average value is defined between the Q1 and Q3. Specifically, the range will be 1.5 times the spread around the median value based on the stricter factor used.
(vii) Low: Values fall below the lower bound of the normal range. The lower bound is determined using by Q1 and represent the 25% of the data.

Financial Performance Analysis

This study integrates three key analytical techniques: benchmarking, comparative analysis, and diagnostic charting to evaluate corporate competitiveness. Benchmarking involves comparing financial metrics against industry norms to assess corporate performance. Two statistical measures were employed in this process: median analysis and interquartile range (IQR) analysis. The median represents the central value of financial metrics, making it more reliable than the mean in highly skewed datasets (Vipond, 2023). It provides a stable reference point for evaluating whether a company's performance is above or below the industry standard. Meanwhile, IQR measures variability and helps detect financial outliers. Companies with values beyond the upper and lower quartile thresholds were identified as outliers, ensuring fair comparisons (Falciola et al., 2020).

Comparative analysis was conducted to explore interrelationships between financial metrics. This method allowed for deeper insights into financial performance by assessing metric-to-metric relationships, performance grouping, and correlation analysis. Metric-to-metric comparisons examined relationships between revenue, earnings, and net profit margin to

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determine profitability patterns (Srivastava, 2022). P/E ratio and P/S ratio were analyzed to assess market valuation trends. Performance grouping categorized companies into top performers, low performers, and average performers based on financial distributions, enabling investors to identify industry leaders and firms with potential for growth (Nadar & Wadhwa, 2019). Statistical correlations between key financial metrics were also analyzed to uncover patterns in financial performance, particularly regarding earnings efficiency and valuation trends (Akben-Selcuk, 2016).

To enhance data interpretation, diagnostic charts were utilized. Bar charts were used to compare financial metrics across companies and industries, while pie charts visualized proportional contributions of different financial indicators. Line graphs illustrated financial trends over time, providing insights into historical performance patterns (Ježovita, 2015). Scatter plots identified outliers and relationships between financial variables, ensuring that data anomalies were accounted for in the analysis (Kaplan & Norton, 2020). Box-and-whisker plots highlighted data distributions and financial anomalies, making it easier to detect variations across firms and industries. These visual tools facilitated a clearer understanding of corporate financial performance (Gu, Kelly, & Xiu, 2021).

The use of statistical measures, performance categorization, and visual analytics ensures that the findings are robust and applicable to investment decision-making and corporate strategy development. This methodology offers a systematic approach to evaluating financial performance, contributing to a more comprehensive understanding of corporate competitiveness.

Findings

Overview Of Dataset, Benchmarking Process And Outlier Management

This study analyzes a total population of 9,912 publicly listed companies. After preprocessing the data and removing missing and zero values, the sample was reduced to 4,256 companies. The first step in benchmarking involves calculating the median and interquartile range (IQR) across companies, regardless of size, to ensure a comprehensive analysis. Both the median value and IQR are particularly useful for identifying extreme values or outliers. In this study, outliers have been removed to focus on typical company performance, ensuring a fair comparison. However, it is important to note that large-cap companies often exhibit more extreme values due to their size and market dominance. Additionally, comparative analyses, such as metric-to-metric comparisons and performance grouping, will be discussed in detail to explore the interrelationships between metrics. Diagnostic charting will also be used to identify top performers among companies, providing valuable insights for investor decision-making.

Distribution Pattern – Key Financial Metrics

The financial metrics employed in this study—revenue, earnings, dividend yield (DY), price-to-earnings (P/E) ratio, price-to-sales (P/S) ratio, earnings yield (EY), and earnings per share (EPS)—exhibit varying degrees of right-skewed distribution, with the exception of net profit margin, which is roughly symmetric, as shown in Appendix A. The right-skewness observed in metrics such as revenue, DY, P/E ratio, P/S ratio, EY, and EPS indicates that most companies are clustered within the lower to mid-range, reflecting strong competition in this segment, which forms the foundation of the market. However, a few companies with extremely high

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values appear as outliers in the boxplots, represented by dots outside the whiskers with long right tails.

In contrast, net profit margin follows a symmetric distribution, with values clustered around the central value and only a few outliers. This suggests an even distribution around the mean without extreme bias. Earnings, on the other hand, exhibit slight right-skewness, showing a more balanced distribution but still a tendency for higher values among a few companies.
The distribution patterns of the financial metrics in this study highlight the predominance of right-skewed distributions, except for net profit margin and earnings, which display symmetric and slightly right-skewed distributions, respectively. This further highlights the importance of using the median and interquartile range (IQR) in benchmarking, as these measures effectively manage outliers and provide a deeper understanding of the true competitive landscape.

Benchmarking On Key Financial Metrics

Summary Of Financial Metrics

Table 1 depict the summary of financial metrics of median, quartile, IQR and outlier bounds for a list of publicly listed companies. Table 1 provides information on each of the metrics on median, Q1, Q3, IQR and the lower and upper quartile which are useful to identify the potential outliers. Technically, values outside the range of lower and upper quartile will be classified as outliers. In this analysis, outliers have been removed for balanced comparison.

Table 1: Summary of Financial Metrics: Median, Quartiles, IQR and Outlier Bounds

Metrics	Median	Q1	Q3	IQR	Lower bound	Upper bound
Revenue (£)	869,300,000	310,010,708	2,229,600,000	1,919,589,292	(2,569,373,230)	5,108,983,938
Earnings (£)	112,608,000	39,031,900	259,815,000	220,783,100	(292,142,750)	590,989,650
Net profit margin (£)	0.1307	0.0743	0.2340	0.1598	(0.1653)	0.4737
P/E ratio (%)	17.8107	11.6265	27.7898	16.1633	(12,61845)	52.03475
P/S ratio (%)	1.4799	0.7522	2.4096	1.6574	(1.7339)	4.8957
EPS (£)	0.9542	0.419	1.848	1.429	(1.7245)	3.99150
DY (%)	240.455	129.441	381.625	252.184	(248.835)	759.901
EY (%)	0.05614	0.03598	0.0860	0.0500	(0.0391)	0.1611

Top 10 Performers By A Single Metric

Figure 3 shows the top 10 performers by reliance on a single metric. Investors tend to favour on metrics such as revenue, earnings, P/E ratio and DY treated them as a key success indicator for investment potential. According to the figure, the results indicates that no single entity appears consistently across all the graphs. The performance on one metric may not reflect the performance on others. Hence, relying on a single metric is insufficient to provide an overview of a company's competitiveness and unable to capture a company's long-term investment.

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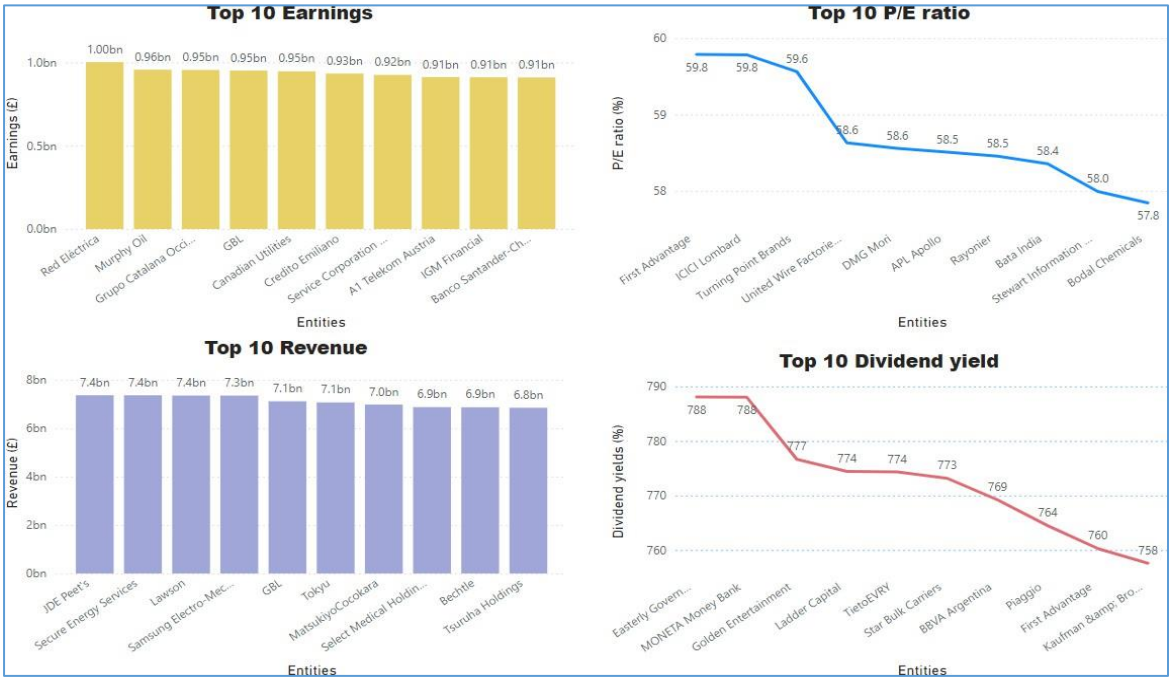

Figure 3: Top 10 Performers By Revenue, Earnings, P/E Ratio And DY

Comparative Analysis On Key Financial Metrics

Revenue, Earnings And Net Profit Margin

Revenue, earnings, and net profit margin are interrelated metrics that share a positive relationship, where higher values indicate better financial performance. These metrics serve as the foundation for assessing a company's competitiveness. Revenue is a key indicator of a company's ability to attract customers and drive sales, while earnings reflect its efficiency in managing costs and generating profit from revenue. Net profit margin, a crucial profitability ratio, measures the percentage of revenue that remains as net profit.

Figure 4 illustrates the positive correlation between revenue and earnings, showing that companies with higher revenue tend to achieve higher earnings, thereby strengthening their competitive position in the market. A concentration of companies with low revenue and earnings is observed near the origin, primarily consisting of small-cap and mid-cap firms, represented by the purple and dark blue clusters. This pattern may indicate challenges these companies face in generating revenue and retaining profit.

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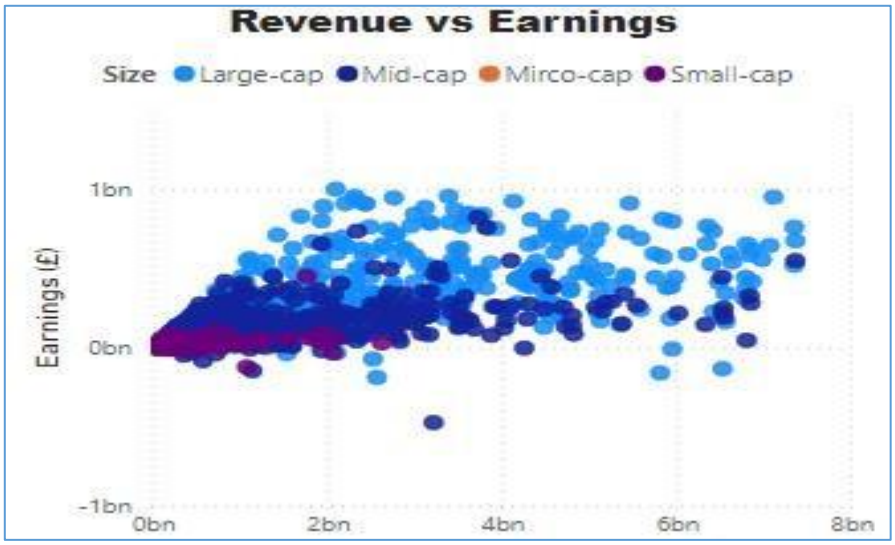

Figure 4: Revenue And Earnings By Company Sizes

Conversely, most companies with high revenue and earnings, represented by the blue cluster, are primarily large-cap firms that benefit from a competitive advantage. However, the presence of outliers with high revenue but negative earnings suggests potential vulnerabilities. These companies, typically mid-cap or large-cap firms, may be experiencing unusual or one-off incidents that temporarily affect their revenue and earnings.

Figure 5 (left plot) illustrates a negative correlation between revenue and net profit margin, indicating that as revenue increases, net profit margin tends to decrease. Many micro-cap, small-cap, and mid-cap companies with lower revenue and varying net profit margins face challenges in maintaining market competitiveness, as seen in the cluster at the bottom left corner. Additionally, mid-cap and large-cap companies in the middle cluster show that, despite generating higher revenue, their net profit margins are lower. This trend may be attributed to more complex cost structures, which reduce overall efficiency in converting sales into profit. On the other hand, some companies with lower revenue but higher net profit margins demonstrate effective cost management, allowing them to maintain strong market leadership.

Figure 5 (right plot) further explores the complex, non-linear relationship between profits and net profit margin, where fluctuations depend on earnings levels. Some outliers, particularly companies with negative earnings and net profit margins, form a distinct cluster in the lower left of the plot. These outliers, spanning various company sizes, likely result from unexpected events or one-off occurrences that have led to short-term business losses, impacting their overall competitiveness.

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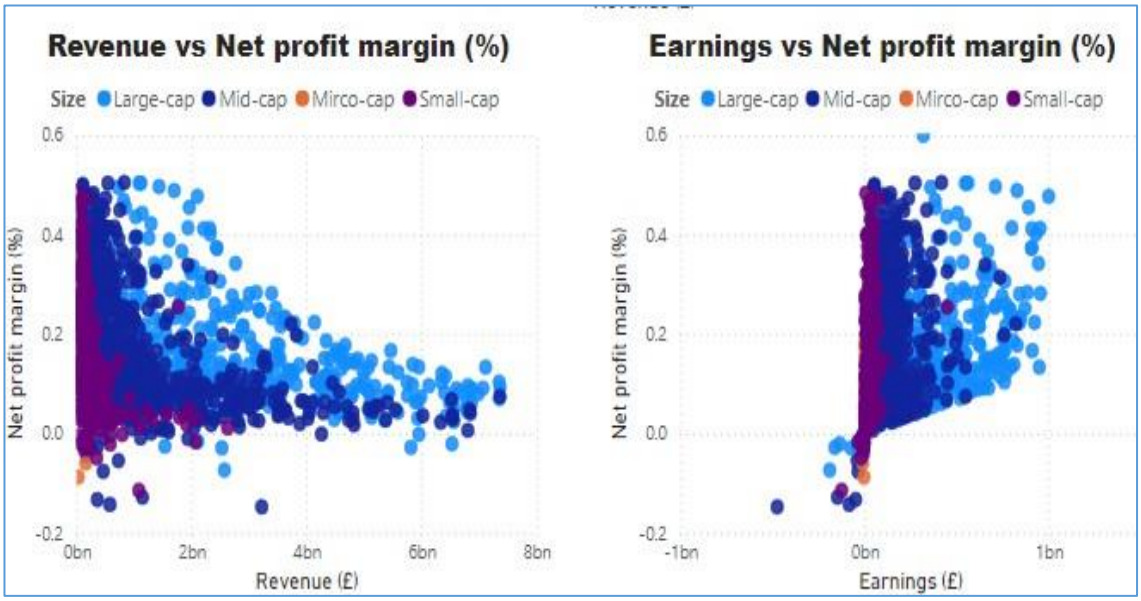

Figure 5: Relationship Between Revenue, Earnings And Net Profit Margin By Company Sizes

Notably, most large-cap and mid-cap companies with higher earnings tend to achieve higher net profit margins, leading to greater profitability. However, the relationship between these two variables is not strictly linear, as it depends significantly on market conditions and various external factors.

P/E Ratio And P/S Ratio

The P/E ratio and P/S ratio are both valuation metrics mainly used to determine the value of a company to access its financial standing relative to market expectation. The P/E reflecting investor expectations of future earnings growth while the P/S ratio reflects revenue growth potential which both ratios are crucial for a company to be competitive.

Figure 6 illustrates a scatter plot of the price-to-earnings (P/E) ratio versus the price-to-sales (P/S) ratio, segmented by company size and performance, revealing a positive correlation between the two metrics. As the P/E ratio rises, the P/S ratio also tends to increase, reflecting an upward trend. However, distinct clusters indicate that company performance influences these valuations.

In the left plot of Figure 6, most companies exhibit average performance, with some having a high P/E ratio and a low P/S ratio, and vice versa. Notably, Eigi Equipment stands out as the only company excelling in both metrics, demonstrating strong competitiveness, with no firms showing weak performance in both financial indicators.

On the right plot of Figure 6, the green and orange clusters appear in the upper-right quadrant, representing mid-cap and large-cap companies with higher P/E and P/S ratios. These firms indicate a competitive edge through strong profitability and revenue generation, contributing to more stable valuations compared to smaller companies. In contrast, the dark purple cluster in the bottom-left quadrant, characterized by lower P/S ratios, is often linked to losses and

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negative P/E ratios. This suggests weaker competitiveness due to unexpected events leading to short-term financial losses, increasing investment risk.

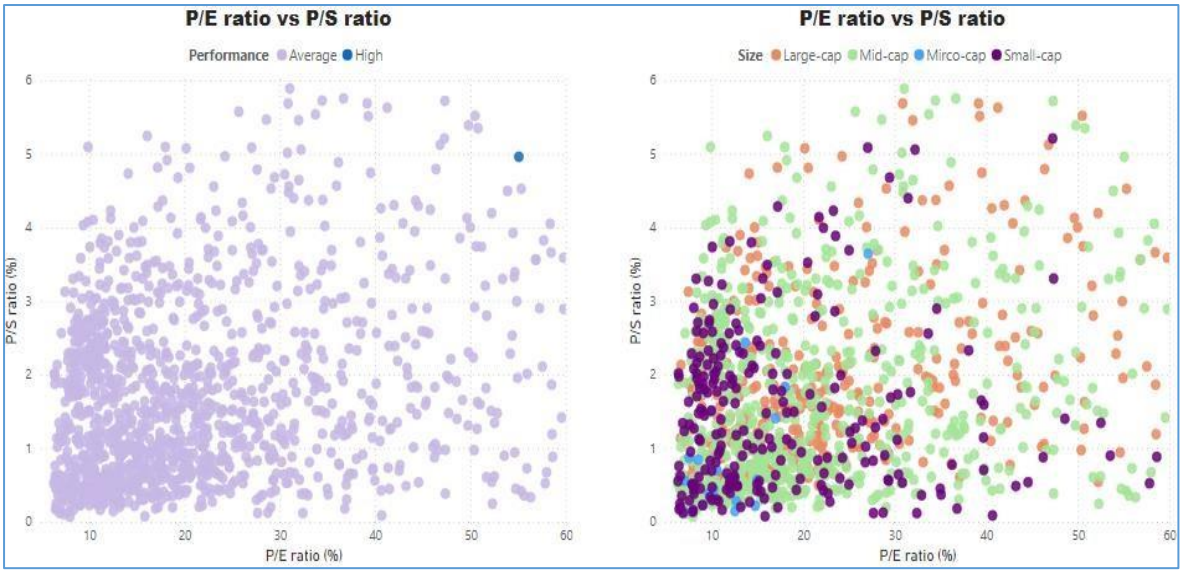

Figure 6: Relationship Between P/E Ratio And P/S Ratio By Performance And Company Sizes

In summary, both metrics are shaping the valuation patterns of the company where P/E ratio focus on earnings potential and P/S ratio looks at revenue growth by providing deeper insights into a company's profitability and growth positioning for investors decision making.

EPS, EY and DY

Standalone metric unable to provide adequate information for comparison with one another. Hence. these metrics are particularly important for a value investor where EPS provide a snapshot of total earnings per share while DY provide overview of annual dividend payment and tend to focus on the portion of distributed profits to shareholders as dividends. EY is closely related to EPS as the computation of EY depends on EPS: the higher EPS indicate the higher profitability and higher EY while share price remain constant.

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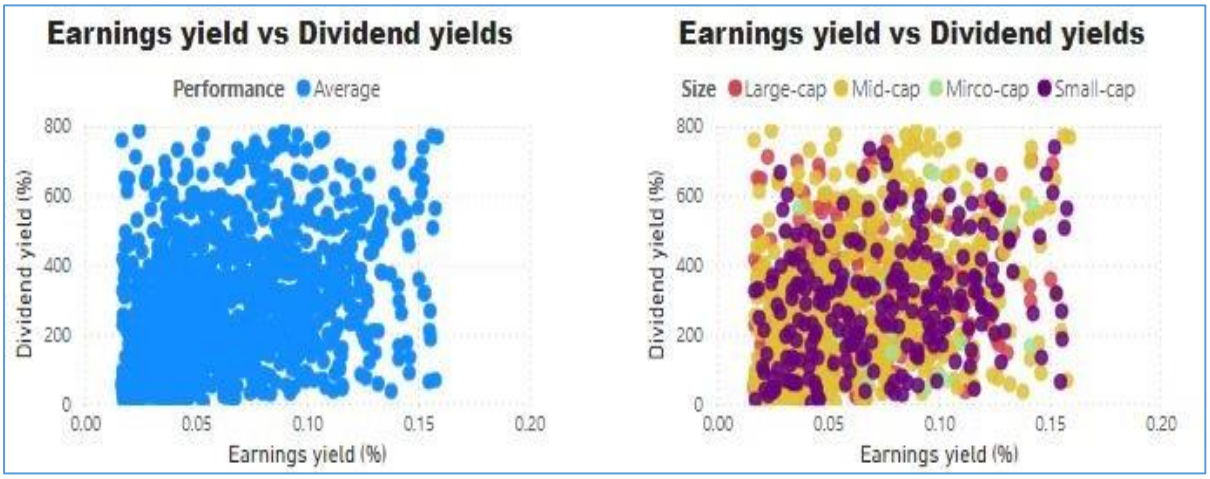

Figure 7: Relationship Between EY And DY By Performance And Company Sizes

According to Figure 7, the scatter plots depicts that the relationship between EY and DY by company size and performance which can provide deeper insights into competitive positioning. Generally, higher EY tend to be associated with higher DY as higher earnings provide companies with more capacity to distribute profits and rewards their investors. However, there is weak positive correlation between the two variables as shown in Figure 7. On the left plot, blue cluster indicate that all companies have average performance with a mix of higher EY with lower DY and vice versa.

However, on the right plot, DY tend to have stronger relationship with company size where the large-cap and mid-cap companies have established dividend policy and more consistent on dividend payouts with the prove of the red and yellow cluster in the middle top of the plot. Conversely, smaller companies such as small cap exhibit more volatile and potentially unsustainable dividend policies which can undermine investor confidence, as shown in dark purple and green cluster.

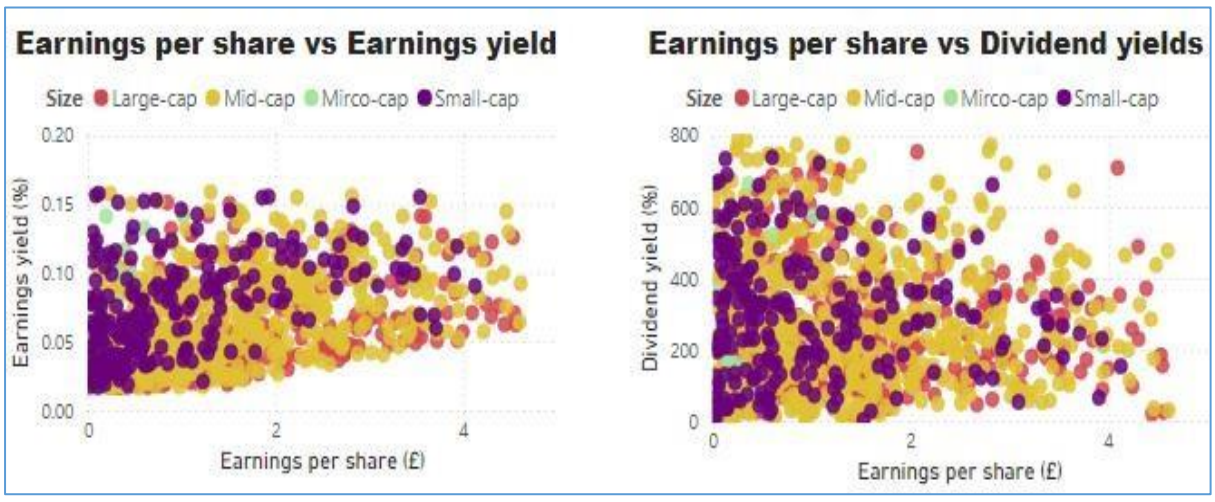

Figure 8: Relationship Between EY, DY And EPS By Company Sizes

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The left plot in Figure 8 illustrates the scatter plot of the relationship between EY and EPS by company sizes showing direct relationship between two variables since EY is derived from EPS. Changes in EPS will affect EY when share price remain unchanged. In the red cluster, large-cap companies are often having higher share price resulting in lower yields despite potentially high EPS. This allow large-cap companies to be competitive in attracting long-term investor while the lower EY might deter value investors looking for higher returns on investment.

In contrast, small companies such as micro-cap and small-cap companies often show a higher EY despite low EPS, as shown in the dark purple cluster on the bottom left. The risk of inconsistent earnings can make them less competitive compared to larger companies, however, it can be attractive return for value investor for short term goal. In contrast, mid-cap companies tend to strike a balance with moderate to higher EPS growth due to the economies of scale allowing highly competitive and appealing more favourable to growth investors.

On the other hand, figure 6 on the right plot depicts the weak positive relationship between DY and EPS by company sizes. There is no guarantee on the increase in EPS can lead to higher DY it is more closely relevant to the company's dividend policy. The graphs show that large-cap companies in the red cluster tend to be more consistent and pay regular dividends while mid-cap companies represented by the yellow cluster exhibit more varied dividend yields than large-caps. Conversely, small cap in dark purple cluster depicts the most scattered with some very high DY and many with zero or very low yields.

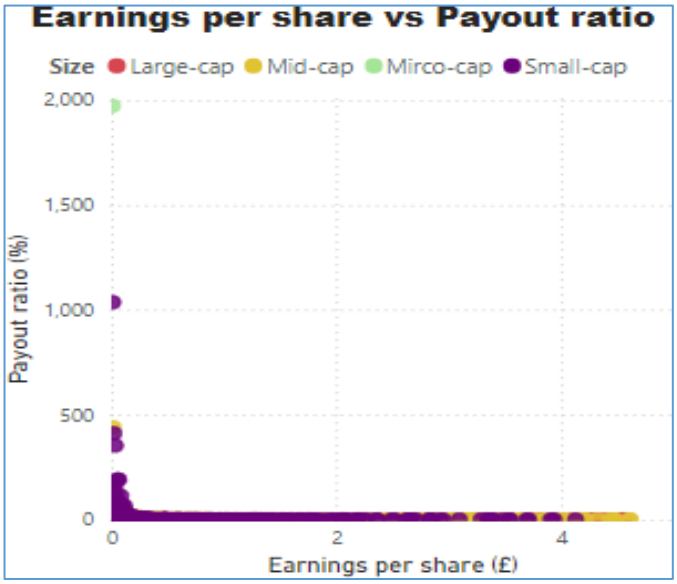

Figure 9: Relationship Between EPS And Payout Ratio By Company Sizes

Figure 9 illustrates the inverse relationship between EPS and payout ratio by company sizes. The payout ratio is calculated by dividing DPS by EPS, providing a deeper insight on how companies allocate their earnings between dividends and reinvestment. Companies with higher EPS particularly in mid-cap and micro-cap companies tend to retain a significant portion of their earnings and prioritize reinvesting earnings for growth resulting the payout ratios typically

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clustering between 0% and 100%. However, this pattern is less pronounced in mid- cap and large-cap companies where a different range of payout ratio is observed at various EPS level showing a better emphasis on dividend distribution along with growth strategies.

Notably there are outliers with extremely high payout ratios above 100% can be a red flag for financial distress especially on small-cap companies which may attempting to offer high payouts to attract investor for investment However, this approach are generally unsustainable in the long term as payout ratio exceeding 100% indicate the company is paying out more in dividends than it earns which could undermine the company's financial health and long-term competitiveness.

Top Performers Ideal For Investment

Which companies are the most competitive and ideal for investment? is a central question concern for investors. There are none of the entity consistently demonstrated "High" or "Low" performance across all financial metrics. This variability is aligned with expectation due to the some of the ratio such as P/E ratio and EY have inverse relationship which typically cannot both exhibit "High" performance simultaneously.

The performance grouping is based on 50% threshold across the 8 financial metrics. If a company show more than 50% "High" performance on its metrics, the overall performance is considered high and strong. Conversely, if below 25% of the total metrics are "High", the overall performance is regarded as low or weak. Any companies fall beyond these two extremes are classified under average performance. However, no companies were found to meet the criteria based on the original classification.

Criteria are then refined to 37.5% threshold which equivalent to 3 or more "High" performance metrics are grouped as "High" while those below 12.5% or only 1 of total metrics are "High", it will the classify as "Low". This adjusted classification allowed us to identify the competitive companies. As a result, we identified two companies as the most competitive within the sample and demonstrating strong financial health and investment potential that ideal for investment.

Table 2: Top Performers Of The Companies

Entity name	Country	Size
BAWAN Group	Saudi Arabia	Mid-cap
Samsung Electro-Mechanics	South Korea	Large-cap

Based on the analysis, BAWAN group and Samsung Electro-Mechanics has emerged as top performers for investment (Table 2). BAWAN group is a mid-cap company from Saudi Arabia which positioning itself as a competitive player in the market and full of potential for future growth. Conversely, Samsung Electro-Mechanics was a company of top 10 revenue within the sample and it is large-cap company from South Korea which further solidifying its standing on the capital market. Both companies are well-positioned for continued success by its exceptional financial health and making them more attractive option for investment.

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Conclusion

In an increasingly dynamic business environment, evaluating a company's competitiveness requires a multifaceted approach rather than relying on a single financial metric. This study aimed to develop a structured framework for assessing corporate competitiveness by analyzing key financial metrics, identifying patterns in financial performance, and benchmarking companies across different sizes and industries.

For Research Objective 1, which is to identify the most critical financial indicators that influence firm competitiveness, it can be concluded that revenue, earnings, and net profit margin are fundamental indicators, with revenue and earnings showing a strong positive correlation. Additionally, the relationship between P/E and P/S ratios confirms their role in assessing market valuation. However, weaker correlations among EPS, DY, and EY highlight the need for a more interconnected approach to financial evaluation, as no single metric can fully capture a company's growth potential.

For Research Objective 2, which is to develop a structured methodology for financial performance benchmarking, this study employed median and interquartile range (IQR) analysis to create a standardized evaluation framework. The median provided a more robust measure of central tendency, reducing the influence of extreme values, while the IQR helped identify and manage outliers. The benchmarking approach categorized companies based on financial performance, ensuring fair comparisons by filtering out extreme values that could skew the results. Additionally, diagnostic charting and comparative analysis were used to assess relationships between financial metrics, allowing deeper insights into financial health and competitiveness. While this method effectively managed skewed data, future research should consider alternative approaches, such as robust regression, to incorporate extreme values without distorting results.

For Research Objective 3, which is to analyze industry-specific variations in financial metrics and their impact on competitiveness, it can be concluded that company size and sectoral differences significantly influence financial performance. The findings indicate that large-cap and mid-cap companies generally exhibit stronger earnings and net profit margins, benefiting from economies of scale and market dominance. However, small-cap firms, which cluster around lower revenue and earnings levels, face greater challenges in maintaining profitability. The study also highlights that companies with high revenue do not always achieve high net profit margins, particularly in industries with complex cost structures. Furthermore, while higher P/E and P/S ratios often signal strong valuation, some companies with high revenue still report negative earnings, indicating vulnerabilities due to market conditions or one-off financial events. The absence of sector-specific analysis in this study limits the ability to draw precise industry-wide conclusions, reinforcing the need for sector-based benchmarking in future research.

The benchmarking process identified only two companies as truly competitive within the dataset. A broader global comparison further validated the methodology, with 29 top-performing companies—many from the Fortune Global 500—emerging as market leaders. However, limitations such as reliance on single-year data, the exclusion of sector-specific insights, and the removal of outliers significantly impacted the depth of the analysis.

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To improve future research, a longitudinal approach incorporating multi-year data, a broader range of financial metrics, and sector-specific benchmarking is recommended. Additionally, segmenting companies by size—small-cap, mid-cap, and large-cap—will ensure a fairer and more representative assessment. By addressing these gaps, future studies can provide a more accurate and comprehensive evaluation of corporate competitiveness, ultimately benefiting investors, policymakers, and business leaders in strategic decision-making.

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