FINANCIAL SCIENCES
NAUKI O FINANSACH

Financial Sciences. Nauki o Finansach
Year 2026, Vol. 31, No. 2
ISSN 2449-9811
journals.uew.pl/fins

When Fundamentals Meet Valuation: ROE as a Proxy for the Cost of Equity

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Quote as: Dąbrowski, P., & Kaczmarzyk, J. (2026). When Fundamentals Meet Valuation: ROE as a Proxy for the Cost of Equity. *Financial Sciences*, *31*(2), 15-25.

DOI: 10.15611/fins.2026.2.02

JEL: G32, G15

Abstract

Aim: This article examines whether Return on Equity (ROE) can be used as a fundamentals-based proxy for the cost of equity and, consequently, as a discount rate in valuation. The research addressed the uncertainty arising from market-based cost-of-equity estimation, especially when inputs are sensitive to assumptions, sentiment, and market conditions.

Methodology: The empirical analysis used quarterly data from LSEG for companies listed on the Warsaw Stock Exchange over the period 2016Q4–2025Q4. Two variables were examined: estimated cost of equity and ROE. The authors applied descriptive statistics, interquartile range analysis, box-plot comparisons, and the Wilcoxon signed-rank test to assess whether median ROE converges toward median cost of equity over time.

Findings: The research results provide partial support for the convergence hypothesis. In the earlier part of the analysed sample, median ROE and median cost of equity were relatively close, and differences were statistically insignificant. However, from around 2022 onwards, the relationship changed, with statistically significant and persistent divergence between both indicators. ROE also showed substantially higher dispersion, reflecting possible accounting volatility, leverage effects, or extraordinary earnings.

Implications: The findings suggest that ROE should not mechanically replace the cost of equity in valuation models. However, it may function as a benchmark when market-based estimates are unreliable.

Originality/value: This study contributes to literature by directly testing the empirical relationship between ROE and cost of equity. It highlights the potential of ROE as a conditional, fundamentals-based discount-rate proxy while emphasising its limitations.

Keywords: corporate finance, valuation, return on equity, cost of equity

1. Introduction

Equity valuation is a fundamental component of investment analysis, corporate finance, and capital allocation. In most income-based valuation models, the discount rate is one of the most influential parameters because it determines the present value of future dividends or free cash flows (to a firm or to equity) to equity, or residual income. Conventional valuation practice usually adopts the cost of equity as the discount rate being the required rate of return in equity valuation models, including the dividend discount model, free cash flow to equity model, and residual income valuation model (Almeida et al., 2012; Farrugia et al., 2019; Rao, 2016; Tang, 2024; Gordon & Shapiro, 1956).

Despite its theoretical importance, the cost of equity is not directly observable. It is generally estimated using models such as the Capital Asset Pricing Model (CAPM) or multifactor asset-pricing models, which require subjective assumptions about the risk-free rate, equity risk premium, beta, estimation period, market portfolio, and expected returns (Hao, 2024; Janas, 2024; Altavilla et al. 2021; Treynor, 1962; Sharpe, 1964; Lintner 1965; Mossin 1966; Ross, 1976a; Ross, 1976b; Fama & French, 1992). Discretionary assumptions introduce substantial estimation uncertainty. Altavilla et al. (2021) explicitly stress that, unlike the cost of debt, the cost of equity must be estimated rather than observed. Similarly, Janas (2024) showed that different methods of beta estimation can significantly alter the discount rate and consequently distort company valuation.

This problem becomes particularly important when market-derived discount rates reflect investor sentiment rather than the underlying fundamentals of the enterprise. Research on sentiment and value relevance suggests that accounting derived variables may become less informative for stock prices during periods of elevated sentiment, especially for companies that are difficult to value or arbitrage (Hanselaar et al., 2019; He et al., 2020). Implied cost of equity models may also suffer from circularity because they infer the discount rate from market prices and then use that discount rate to assess value (Daske et al., 2004; Peng et al., 2024).

Return on Equity offers an alternative anchor. ROE is directly derived from accounting data and measures the profitability generated on shareholders' capital. In residual income valuation, ROE and cost of equity are jointly central: value is created when ROE exceeds the cost of equity and destroyed when ROE falls below it (Almeida et al., 2012; Nekrasov & Shroff, 2009; Moyo & Obadire, 2024). This theoretical relationship suggests that ROE may contain information relevant not only for assessing profitability, but also for estimating or benchmarking the required return on equity capital.

Therefore the purpose of this paper was to investigate whether ROE can be used as a discount-rate proxy (understood as something that indirectly represents a given thing) in equity valuation. The authors argue that such substitution may be justified under certain conditions because ROE is closer to company fundamentals and less directly exposed to market sentiment than estimated cost of equity. At the same time, it was acknowledged that ROE is more volatile and may be distorted by accounting effects, leverage, or extraordinary earnings. Accordingly, the article does not propose the mechanical use of ROE in all valuations, but rather examines whether ROE can serve as a fundamentals-based benchmark for cost of equity.

2. Literature Review

The cost of equity is usually defined as the rate of return required by shareholders for bearing the risk of investing in a company's equity (Daske et al. 2004; Hao, 2024; Gordon & Shapiro, 1956). In discounted equity valuation, it functions as the denominator that converts forecasted future benefits into present value. In the free cash flow to equity approach, equity value is commonly expressed as the present value of future cash flows to equity discounted at the cost of equity, plus terminal value discounted at the same rate (Farrugia et al., 2019; Rao, 2016; Bolibok, 2017; Zarzecki, 1999).

The dominant theoretical framework for estimating the cost of equity remains the CAPM, which links expected return to systematic risk through beta (Hao, 2024; Janas, 2024), however empirical evidence has repeatedly questioned the precision and practical reliability of CAPM-based estimates. Daske et al. (2004) noted that traditional asset-pricing models have produced disappointing empirical results, while Janas (2024) highlighted the absence of consensus on beta estimation. Evidence shows that practitioners use diverse and sometimes subjective approaches to estimate the required rate of return (Altavilla et al., 2021; Reis & Augusto, 2019), furthermore some studies strongly suggest that the CAPM is preferred primarily because of its simplicity (Graham & Harvey, 2001).

This situation creates an important valuation problem: if the cost of equity is model-dependent, then valuation outcomes may be heavily influenced by methodological choices rather than by the company's economic fundamentals. Moreover, small changes in discount rates can produce large changes in estimated equity value, particularly when terminal value represents a high share of total valuation (Janas, 2024).

Several limitations motivated the search for an alternative or complementary discount-rate benchmark. First, beta-based estimates are sensitive to the choice of market index, return interval, estimation window, and adjustment method (Janas, 2024). Second, market-based cost of equity may be affected by investor sentiment, liquidity conditions, and temporary market dislocations. He et al. (2020) showed that the value relevance of accounting variables decreases in high-sentiment periods, suggesting that market prices may deviate from fundamentals when sentiment is elevated. Third, implied cost of equity models may be circular, solving as a solution for the discount rate that equates current market price with intrinsic value, but this assumes that current market prices are themselves informative and efficient (Daske et al., 2004; Peng et al., 2024).

These limitations are particularly relevant in empirical valuation where analysts must derive a discount rate based on a set of subjective assumptions, thereby giving rise to model-risk exposure. If the estimated cost of equity is contaminated by market sentiment, excessive risk aversion or methodological instability, it may become detached from the company's sustainable profitability.

ROE measures the accounting return generated on shareholders' equity. Unlike cost of equity, it is directly observable from financial statements and reflects the company's actual profitability on book equity (Altavilla et al., 2021; Almeida et al., 2012; Bolibok, 2017; King & Segal, 2003). ROE is a synthetic value driver derived from net income and the book value of equity in accounting-based valuation models. In residual income valuation, company value equals book value plus the present value of expected residual income. Residual income is generated when earnings exceed the capital charge imposed on beginning book equity, where the capital charge is calculated using the cost of equity (Altavilla et al., 2021; Nekrasov & Shroff, 2009; Szczepankowski, 2007). This framework makes the ROE-cost of equity relation explicit. If ROE exceeds the cost of equity, the company generates positive residual income and creates value, and if ROE equals the cost of equity, it earns only the required return, and value tends to align with book value. If ROE falls below the cost of equity, residual income is negative and value is destroyed (Moyo & Obadire, 2024; Szczepankowski, 2007).

A key theoretical argument supporting this paper is that in competitive equilibrium, company returns on equity should converge toward their cost of equity over time. Those with ROE exceeding cost of equity attract competition and capital, which gradually erodes abnormal returns, whilst companies

earning below the cost of equity must improve profitability, restructure, or exit. This mechanism implies that sustainable ROE should tend toward the required return on equity capital (Faugère & Van Erlach, 2009; Pastor & Veronesi, 2003).

Faugere and Van Erlach (2009) explicitly formulated the idea that price converges toward book value per share when ROE matches the required return. Similarly, the residual income valuation framework associated with Ohlson (1995) assumed that abnormal profitability gradually fades over time, with ROE converging toward the cost of equity. Pastor and Veronesi (2003) modelled ROE as a mean-reverting process, showing that profitability may be volatile at company level but still tends towards a long-term central value.

Nekrasov and Shroff (2009) provided an especially important link between accounting fundamentals and discount-rate estimation. Their fundamentals-based risk adjustment relied on the covariance of company-level ROE with market-wide factors, which means that ROE contains risk information that can be transformed into a fundamentals-based cost of equity. This finding directly supports the proposition that ROE may serve not only as a profitability measure but also as a source of discount--rate information.

Prior empirical studies stressed the importance of ROE in valuation, although they generally did not test its direct substitutability for cost of equity. The indirect approach was presented by Nekrasov and Shroff (2009).

King and Segal (2003) found that ROE and cost of equity are both determinants of valuation multiples. Altavilla et al. (2021), in their analysis of euro area banks, used cost of equity estimates together with ROE when assessing business model sustainability and assumed that ROE converges toward a long-run median. Atkeson et al. (2019) showed that ROE is a central determinant of bank valuation and viability.

Taken together, the literature suggests that ROE and cost of equity are theoretically connected, jointly relevant for valuation, and potentially convergent in long-run equilibrium, however it does not provide sufficient direct evidence on whether ROE may be used as a discount-rate proxy. This article addresses that research gap.

Based on the critical literature review and the theoretical assumption of convergence between ROE and the cost of equity, the authors formulated the following working hypothesis: the median value of ROE converges toward the median value of cost of equity across time. As ROE reflects company-specific accounting profitability, while cost of equity is usually estimated through market-based models (mostly CAPM), ROE may exhibit greater dispersion. If the hypothesis turned out to be true, ROE could be considered as a discount-rate proxy in equity valuation.

3. Methodology

The empirical analysis was based on quarterly data obtained from LSEG, formerly Refinitiv Eikon, for all companies listed on the Warsaw Stock Exchange. The sample covered all the listed companies observed from 2016Q4 to 2025Q4. The rationale behind considering ‘all’ was justified by relating to the cost of equity derived using the CAPM model. The CAPM model refers to a market portfolio (a portfolio comprising all stocks listed on a respective capital market). The market portfolio theoretically should encompass all companies (even those not listed), but practically main indices were applied. The number of observations ranged from 336 companies at the beginning of the sample to 551 companies in the later period, with an average of approximately 453 observations per quarter. The sample period covered the last ten full years (the period starts with Q4, as accumulated earnings were applied to calculate ROE). The sample period was chosen bearing in mind that as of 3 July 2016, capital market participants are required to comply with Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse (the “MAR Regulation”).For each quarter, two variables were analysed: estimated cost of equity, denoted as EC, and Return on Equity,

denoted as ROE. ROE was derived as a trailing four-quarter figure, calculated as cumulative income available to common shareholders divided by common equity.

The quarterly cross-sectional descriptive statistics for both variables is provided in the article, including the number of observations, mean, standard deviation, minimum, maximum and quantiles (i.e. 10%, 25%, 50%, 75% and 90%).

The analysis is descriptive and comparative. To verify the working hypothesis, which assumes that the median ROE converges toward the median cost of equity over time, the Wilcoxon signed-rank test was performed to assess whether the medians of paired quarterly observations of ROE and the cost of equity differ significantly. The authors calculated and considered the interquartile range and standard deviation for each variable to compare robust dispersion. Box plots were used to visualise the distribution of both indicators over time.

The methodological focus was on medians and interquartile ranges rather than on arithmetic means because ROE contains extreme observations. These outliers may result from negative or very small book equity, extraordinary profits or losses, restructuring effects, one-off impairments, leverage, or accounting anomalies, hence the median was treated as the primary indicator for evaluating whether ROE can serve as a discount-rate benchmark.

4. Results

The results of the analysis (Figure 1, Table 1) indicate that the relationship between ROE and the cost of equity changed over time. In the first part of the analysed period, the medians of ROE and the cost of equity were relatively close, and the Wilcoxon signed-rank test in most quarters did not provide any arguments for rejecting the hypothesis of no significant differences between paired observations, therefore in these periods the levels of the medians of both indicators can be regarded as statistically similar, which supported the hypothesis of convergence of the median ROE toward the median cost of equity.

From around 2022 onward, however, a change in this relationship was visible. The Wilcoxon test began to indicate statistically significant differences between ROE and the cost of equity, as confirmed by the low p-values shown in the figure. In subsequent quarters, especially from the second quarter of 2022 to the end of 2025, *p*-values remained very low, often close to zero, thus the differences between the distributions of paired observations of ROE and the cost of equity were statistically significant. Consequently, the hypothesis of persistent convergence of the medians was not supported in the later part of the sample.

The box plots also show that the cost of equity had a more stable and narrower distribution than ROE. The median cost of equity gradually increased during 2022 and then stabilised (from 2023) at a level higher than in the initial part of the sample. ROE, in turn, exhibited much greater volatility, a wider interquartile range, and a larger number of extreme observations. This was particularly visible after 2020, when the distribution of ROE became more dispersed and asymmetric, with numerous negative values and positive outliers. The comparison of the dispersion of both variables led to the conclusion that ROE is a significantly more unstable indicator than the cost of equity.

Overall, the results partially support the research hypothesis. In the early years of the sample, the medians of ROE and the cost of equity did not differ significantly, which may be interpreted as evidence of their convergence. However, in the later period, particularly from 2022 onward, the Wilcoxon test indicates systematic and statistically significant differences between the two indicators. This means that convergence is not persistent over the entire analysed horizon. The results suggest rather a temporary convergence of medians followed by a clear divergence.

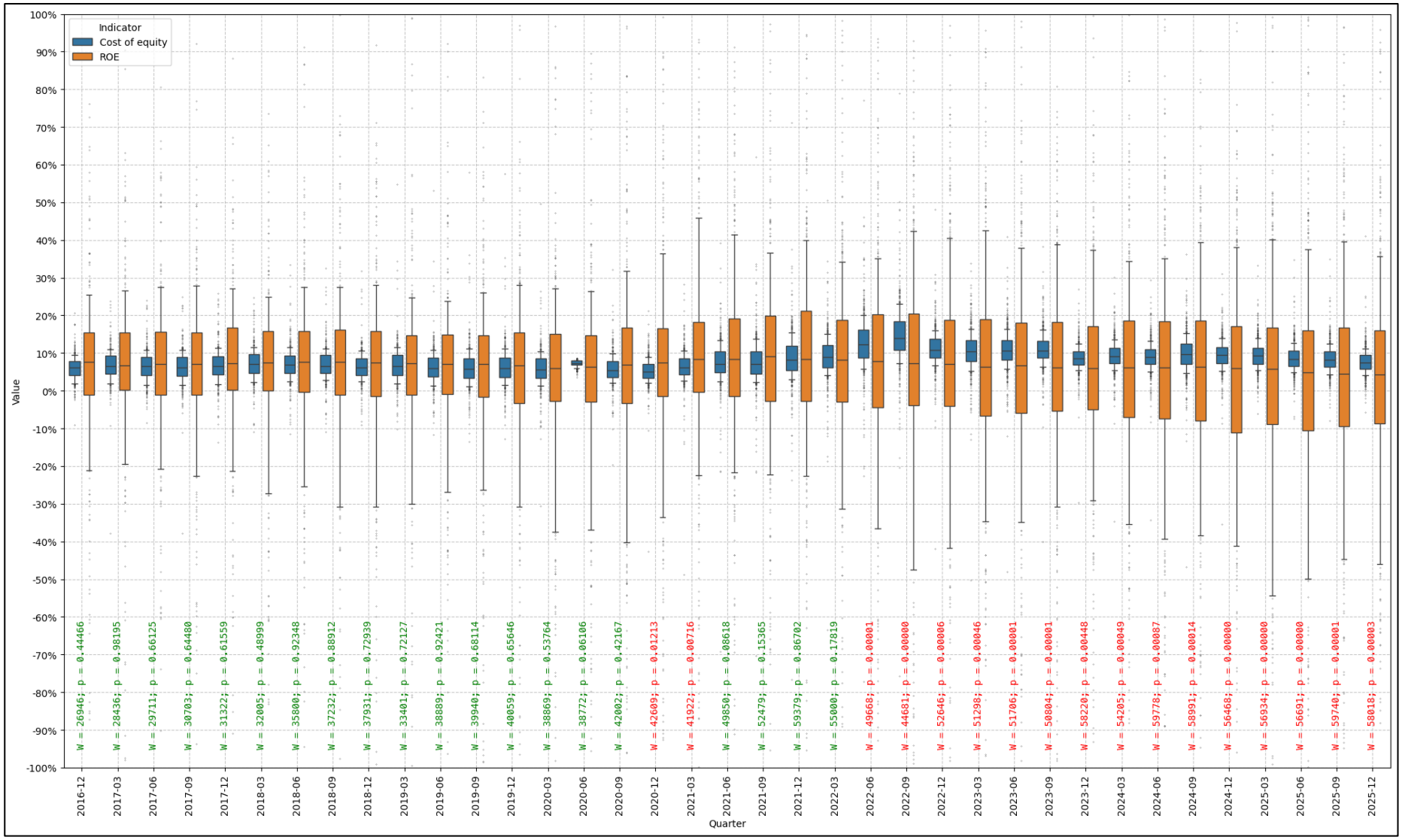


Fig. 1. Quarterly distributions of cost of equity and ROE and Wilcoxon test results for 2016Q4-2025Q4

Source: own elaboration based on LSEG data.

Table 1. Descriptive statistics (2016Q4−2025Q4)

Measure	Quarter	*2016Q4*	*2017Q1*	*2017Q2*	*2017Q3*	*2017Q4*	*2018Q1*	*2018Q2*	*2018Q3*	*2018Q4*	*2019Q1*	*2019Q2*	*2019Q3*	*2019Q4*	*2020Q1*	*2020Q2*	*2020Q3*	*2020Q4*	*2021Q1*	*2021Q2*
	count	336	337	349	355	359	365	379	387	393	369	395	404	405	401	416	419	444	443	468
EC	mean	6.0%	6.7%	6.6%	6.3%	6.8%	7.2%	7.1%	7.0%	6.4%	6.8%	6.3%	6.2%	6.4%	5.9%	7.3%	5.7%	5.2%	6.4%	7.4%
	std	3.3%	4.7%	4.2%	4.9%	4.8%	4.5%	4.7%	4.5%	4.2%	5.4%	5.2%	5.8%	5.6%	5.4%	0.9%	4.2%	3.9%	4.9%	6.5%
	min	-9.1%	-37.8%	-8.5%	-37.9%	-13.8%	-10.8%	-11.5%	-10.9%	-9.1%	-10.1%	-11.6%	-13.6%	-12.7%	-30.6%	3.7%	-19.5%	-42.6%	-48.7%	-69.2%
	10%	1.9%	1.9%	1.6%	1.4%	1.7%	2.3%	2.5%	2.8%	2.5%	2.0%	1.4%	1.0%	1.5%	1.4%	6.1%	2.1%	2.0%	2.7%	2.4%
	25%	4.1%	4.5%	4.2%	3.9%	4.3%	4.7%	4.6%	4.6%	4.2%	4.1%	3.7%	3.4%	3.5%	3.4%	7.0%	3.6%	3.4%	4.3%	4.8%
	50%	6.1%	6.6%	6.6%	6.2%	6.6%	7.1%	6.9%	6.5%	6.1%	6.4%	6.1%	5.8%	6.0%	5.7%	7.4%	5.5%	5.0%	6.1%	7.1%
	75%	7.8%	9.3%	8.9%	8.9%	9.1%	9.6%	9.3%	9.4%	8.6%	9.5%	8.8%	8.6%	8.9%	8.7%	8.0%	7.8%	7.1%	8.7%	10.5%
	90%	9.6%	11.0%	10.9%	10.9%	11.3%	11.7%	11.5%	11.2%	10.7%	11.7%	10.9%	11.2%	11.2%	10.5%	8.1%	9.9%	9.0%	10.7%	13.4%
	max	20.6%	23.7%	24.0%	25.0%	25.8%	24.8%	33.5%	32.5%	31.9%	54.8%	53.1%	58.0%	57.5%	49.7%	8.7%	32.1%	21.1%	28.3%	39.2%
ROE	mean	-5.9%	-18.1%	-12.1%	99.1%	4.2%	11.1%	14.5%	-27.3%	57.9%	192.9%	-11.1%	-1.7%	-97.6%	-15.5%	-0.8%	-39.9%	-9.1%	26.7%	9.0%
	std	187.1%	252.2%	306.4%	1952.9%	359.3%	127.3%	160.9%	597.0%	1,109.1%	3,527.4%	525.8%	143.2%	1,907.9%	194.7%	161.9%	534.0%	188.0%	261.3%	292.8%
	min	-2,872.3%	-3,409.6%	-3,101.4%	-3,464.1%	-4,581.4%	-296.4%	-517.5%	-10,987.2%	-1,229.0%	-1,218.8%	-8,878.6%	-1,166.2%	-38,352.6%	-2,564.6%	-1,988.9%	-8,112.2%	-1,997.0%	-950.5%	-4,618.9%
	10%	-21.3%	-19.5%	-21.2%	-22.7%	-21.5%	-27.5%	-25.8%	-30.9%	-31.6%	-30.3%	-28.1%	-26.8%	-31.2%	-37.4%	-38.5%	-40.4%	-34.4%	-22.6%	-21.9%
	25%	-1.1%	0.1%	-1.0%	-1.0%	0.2%	0.1%	-0.4%	-1.1%	-1.4%	-1.0%	-0.8%	-1.7%	-3.3%	-2.7%	-3.0%	-3.3%	-1.4%	-0.3%	-1.4%
	50%	7.6%	6.7%	7.1%	7.2%	7.3%	7.5%	7.6%	7.7%	7.4%	7.2%	7.1%	7.2%	6.7%	6.0%	6.3%	6.9%	7.4%	8.3%	8.4%
	75%	15.4%	15.5%	15.6%	15.5%	16.7%	15.9%	15.9%	16.2%	15.8%	14.7%	14.8%	14.8%	15.4%	15.0%	14.6%	16.7%	16.6%	18.2%	19.2%
	90%	26.4%	26.9%	27.6%	28.2%	27.3%	25.3%	27.5%	27.7%	28.6%	24.7%	24.3%	26.1%	28.3%	27.2%	26.5%	32.1%	37.2%	46.9%	41.5%
	max	887.6%	1,173.4%	2,113.1%	36,498.9%	4,868.7%	2,120.6%	2,510.5%	2,237.0%	21,824.3%	67,364.3%	5,028.1%	1,864.8%	1,033.8%	379.6%	2,030.2%	671.7%	1,294.7%	4,724.5%	3,608.9%

Measure	Quarter	*2021Q3*	*2021Q4*	*2022Q1*	*2022Q2*	*2022Q3*	*2022Q4*	*2023Q1*	*2023Q2*	*2023Q3*	*2023Q4*	*2024Q1*	*2024Q2*	*2024Q3*	*2024Q4*	*2025Q1*	*2025Q2*	*2025Q3*	*2025Q4*	**Avg.**
	count	476	489	486	505	509	514	500	518	512	521	513	535	539	541	543	545	551	540	**453**
EC	mean	7.5%	8.7%	9.1%	12.5%	14.6%	11.1%	10.5%	10.7%	11.0%	8.7%	9.3%	9.1%	9.7%	9.5%	9.5%	8.7%	8.5%	7.7%	**8.1%**
	std	7.2%	7.8%	6.7%	8.9%	9.2%	5.4%	5.9%	5.7%	5.1%	3.8%	4.4%	4.3%	5.5%	4.4%	3.9%	3.9%	3.9%	3.6%	**5.1%**
	min	-70.2%	-76.6%	-63.4%	-77.1%	-75.6%	-41.9%	-50.2%	-48.1%	-40.1%	-29.6%	-34.6%	-34.2%	-46.8%	-35.4%	-6.1%	-7.4%	-7.9%	-5.8%	**-31.2%**
	10%	2.3%	3.0%	4.1%	5.8%	7.2%	6.6%	5.2%	5.9%	6.4%	5.4%	5.4%	5.0%	4.6%	5.3%	5.4%	4.7%	4.4%	4.1%	**3.6%**
	25%	4.5%	5.4%	6.2%	8.8%	10.7%	8.7%	7.9%	8.2%	8.7%	6.9%	7.3%	7.1%	7.0%	7.4%	7.1%	6.6%	6.3%	5.7%	**5.7%**
	50%	7.2%	8.2%	8.9%	12.3%	14.0%	10.8%	10.5%	10.6%	10.7%	8.5%	9.2%	9.0%	9.7%	9.5%	9.2%	8.5%	8.2%	7.5%	**7.9%**
	75%	10.5%	11.9%	12.0%	16.2%	18.4%	13.8%	13.5%	13.4%	13.3%	10.4%	11.4%	11.0%	12.5%	11.6%	11.4%	10.6%	10.4%	9.5%	**10.5%**
	90%	13.8%	15.6%	15.1%	20.3%	23.1%	16.1%	16.3%	16.4%	16.3%	12.4%	13.6%	13.2%	15.2%	13.9%	14.1%	12.8%	12.5%	11.2%	**12.9%**
	max	62.0%	71.2%	50.5%	77.2%	78.9%	48.1%	33.8%	40.9%	38.2%	26.9%	30.2%	29.4%	36.2%	31.0%	33.2%	34.7%	35.0%	41.0%	**39.0%**
ROE	mean	227.6%	122.9%	-862.5%	-1,052.5%	3,819.3%	-237.5%	8.0%	-168.0%	-32.6%	-18.7%	-19.7%	-3,165.3%	15.9%	100.6%	13.3%	-123.2%	12.6%	-18.1%	**-32.5%**
	std	3,526.3%	5,456.1%	15,218.4%	21,931.6%	85,731.1%	5,040.6%	142.9%	2,820.7%	939.8%	648.7%	1,031.9%	58,271.3%	695.2%	1,560.6%	743.2%	3,529.0%	1,321.6%	270.2%	**5,991.0%**
	min	-1,299.1%	-46,793.7%	-326,184.3%	-491,760.0%	-7,646.0%	-113,788.8%	-1,156.2%	-61,863.2%	-21,115.1%	-13,536.7%	-20,406.9%	-1,303,817.8%	-7,146.3%	-2,294.5%	-3,888.1%	-782,00.0%	-13,927.0%	-4,907.7%	**-70,811.9%**
	10%	-22.8%	-22.7%	-32.4%	-36.5%	-48.1%	-43.8%	-34.7%	-35.5%	-31.7%	-29.1%	-35.9%	-41.2%	-38.5%	-41.1%	-54.9%	-50.0%	-44.7%	-46.1%	**-33.1%**
	25%	-2.7%	-2.8%	-2.9%	-4.4%	-3.9%	-4.0%	-6.5%	-6.0%	-5.4%	-4.9%	-7.0%	-7.4%	-8.0%	-11.0%	-8.8%	-10.5%	-9.4%	-8.8%	**-3.8%**
	50%	9.1%	8.5%	8.2%	7.8%	7.2%	7.1%	6.4%	6.7%	6.2%	6.0%	6.1%	6.1%	6.4%	6.0%	5.9%	4.9%	4.6%	4.4%	**6.9%**
	75%	19.9%	21.1%	18.8%	20.3%	20.4%	18.7%	19.0%	18.0%	18.2%	17.2%	18.7%	18.4%	18.7%	17.1%	16.8%	16.1%	16.8%	16.0%	**17.1%**
	90%	37.9%	40.2%	34.4%	35.5%	42.4%	40.8%	42.6%	38.1%	39.0%	37.4%	34.9%	35.4%	39.5%	38.2%	40.3%	38.6%	39.6%	35.7%	**33.8%**
	max	66,322.0%	111,021.2%	2,306.4%	6,295.1%	1,934,031.9%	6,990.5%	1,592.7%	438.1%	1,493.4%	4,510.6%	11,035.2%	6,472.0%	10,301.9%	28,681.3%	15,449.3%	24,913.7%	25,617.5%	2,211.5%	**65,457.3%**

Notes: The table presents quarterly descriptive statistics for the EC and ROE measures. For each quarter, count denotes the number of available observations; mean represents the arithmetic average; and std is the standard deviation, indicating the dispersion of observations around the mean. Min and max report the lowest and highest observed values, respectively. The 10%, 25%, 50%, 75%, and 90% statistics correspond to the respective percentiles of the distribution. In particular, the 50% percentile represents the median, while the 25% and 75% percentiles indicate the lower and upper quartiles. All EC and ROE values are reported in percentage terms.

Source: own elaboration based on LSEG data.

Therefore, the results suggest that ROE may approximate the cost of equity in terms of median levels, but not in terms of distributional stability, hence the hypothesis which assumes that the median ROE converges toward the median cost of equity over time is supported only in a limited sense. However, this does not preclude the practical application of ROE as an alternative measure of the cost of equity and, consequently, as a proxy for the discount rate, since ROE more closely reflects a company's accounting-based performance.

5. Discussion

The findings contribute to valuation theory by investigating whether ROE may be considered to be a substitute or proxy for cost of equity. The empirical evidence shows that median ROE and median cost of equity may be close over time. This supports the theoretical argument that sustainable profitability should converge toward the required return on equity capital in competitive equilibrium (Faugere & Van Erlach, 2009; Pastor & Veronesi, 2003).

The substantially higher dispersion of ROE confirms that raw accounting profitability cannot be used mechanically as a discount rate, while ROE is affected by earnings volatility, leverage, extraordinary items, and accounting events. This is consistent with prior research showing that company profitability is volatile and that accounting-based measures contain both value-relevant information and company--specific noise (Altavilla et al., 2021; Almeida et al., 2012; Bolibok, 2017; King & Segal, 2003; Pastor & Veronesi, 2003).

If cost of equity is difficult to estimate and ROE contains fundamentals-based risk information, then ROE may provide a useful valuation anchor (Almeida et al., 2012; Nekrasov & Shroff, 2009). This is particularly relevant when cost of equity estimates are contaminated by investor sentiment, market volatility, or unreliable beta estimation (Janas, 2024; He et al., 2020).

From a practical valuation perspective, ROE may be used in two ways. First, it can serve as a reasonableness check for estimated cost of equity. If the estimated cost of equity deviates substantially from ROE, the assumptions behind the discount rate should be reconsidered. Second, ROE may be used as a proxy when market-based cost of equity is unreliable, especially for businesses with unstable beta estimates, limited liquidity, or distorted market prices (e.g. due to investor sentiment).

Therefore, this paper supports a conditional substitution thesis. It is not argued that ROE should always replace cost of equity, instead the evidence suggests that ROE is a theoretically grounded and empirically observable benchmark that may improve valuation robustness when market-derived discount rates are unreliable.

6. Conclusions

This study investigated whether Return on Equity can be used as a proxy for the discount rate in equity valuation. The study was motivated by the fact that the cost of equity, although theoretically central to valuation, is not directly observable and must usually be estimated using models such as CAPM. These models require assumptions regarding beta, the risk-free rate, the equity risk premium, and the estimation period or the data interval, which may introduce methodological uncertainty and expose valuation results to market sentiment and model risk.

The empirical analysis, based on quarterly data for companies listed on the Warsaw Stock Exchange between 2016Q4 and 2025Q4, provided only partial support for the hypothesis that median ROE converges toward median cost of equity over time. In the earlier part of the sample, the medians of both variables were relatively close, and the Wilcoxon signed-rank test often did not indicate

statistically significant differences between median ROE and median cost of equity over time. This suggests that, under certain market conditions, ROE may approximate the cost of equity at the aggregate median level and may therefore serve as a useful fundamentals-based benchmark.

However, this convergence was not persistent over the entire research period, as from around 2022 onward, statistically significant differences between ROE and the cost of equity became noticeable. Thus the results indicated a temporary convergence followed by clear divergence. Moreover, ROE displayed substantially higher dispersion than the cost of equity, with wider interquartile ranges and numerous extreme observations, confirming that ROE is more sensitive to company-specific accounting effects, leverage, low book equity, extraordinary earnings, and other distortions.

The findings suggest that ROE should not be used mechanically as a replacement for the cost of equity in valuation models, since its volatility and accounting sensitivity limit its direct and unquestionable application as a discount rate. Nevertheless, ROE may still provide valuable information for equity valuation. In particular, it can be used as a check for estimated cost of equity or as an alternative benchmark when market-based estimates are unreliable, unstable, or affected by investor sentiment. In this sense, the paper supports a conditional substitution thesis: ROE may serve as a fundamentals-based proxy or reference point for the discount rate.

The article contributes to the literature by directly examining the empirical relationship between ROE and cost of equity in the context of discount-rate estimation. It shows that the theoretical link between profitability and required return is relevant. Future research could extend the analysis by separating companies by sector, size, leverage, profitability persistence, or liquidity. Such extensions may help identify the conditions under which ROE becomes a more reliable proxy for the required return on equity capital.

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