

Profitability or Financial Leverage?**A Comparative DuPont Analysis of Apple and Microsoft, 2020-2024**Author: **Georges A. Barhouche¹***Affiliation:*

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Abstract:

This study compares the financial performance of Apple Inc. and Microsoft Corporation over fiscal years 2020-2024 using the three-step DuPont framework. The analysis separates return on equity (ROE) into net profit margin, asset turnover, and the equity multiplier to identify whether shareholder returns were driven primarily by operating profitability, asset-use efficiency, or financial leverage. Audited financial statement data were collected from Apple and Microsoft annual reports and Form 10-K filings, with 2019 balance-sheet values used only to calculate the beginning balances required for 2020 average assets and average equity. Results show that Microsoft maintained the higher five-year average net profit margin (34.84% versus 24.28%), while Apple generated higher average asset turnover (1.04x versus 0.53x) and a substantially higher average equity multiplier (5.59x versus 2.28x). Consequently, Apple recorded a much higher average ROE (145.19% versus 42.07%), even though Microsoft exhibited stronger margins. The decomposition indicates that Apple's elevated ROE cannot be interpreted as a pure profitability advantage because capital structure and a comparatively smaller equity base materially amplify the ratio. The study demonstrates the usefulness of DuPont analysis for avoiding simplistic ROE comparisons and for separating operating performance from balance-sheet leverage effects. Its main limitations are the two-company sample, differing fiscal year-ends, and reliance on accounting values rather than market-value measures.

Keywords:

DuPont analysis, return on equity, profitability, asset turnover, financial leverage, Apple, Microsoft, financial statement analysis

Introduction:

Return on equity is one of the most frequently cited indicators of corporate performance because it expresses net income relative to the book capital attributable to shareholders. A high ROE, however, can arise from very different economic mechanisms. A firm may earn unusually high margins, use its assets efficiently, or operate with a relatively small equity base because of debt financing and share repurchases. Treating ROE as a single summary percentage can therefore conceal the operating and financing choices that produced it.

Apple Inc. and Microsoft Corporation provide a useful comparison. Both are large technology companies with global operations, strong cash-generation capacity, and substantial intangible resources, yet their business models and capital structures differ. During 2020-2024, both firms reported large profits, but their balance-sheet structures evolved differently. A direct ROE comparison without decomposition would not show whether the difference came from profitability, efficiency, or leverage.

The problem addressed by this research is therefore not whether one company is simply “better,” but whether the drivers of shareholder accounting returns differ materially between the two firms. The applied research gap is a transparent, reproducible five-year comparison that decomposes the observed ROE of Apple and Microsoft into the three DuPont components using audited primary financial statements. This approach is consistent with the broader financial-statement-analysis literature, which emphasizes disaggregation rather than reliance on a single top-level ratio.

Core research questions

1. RQ1: How did Apple and Microsoft differ in ROE from fiscal 2020 through fiscal 2024?
2. RQ2: To what extent were the differences in ROE associated with net profit margin, asset turnover, and the equity multiplier?
3. RQ3: How did the relative importance of operating performance and financial leverage change over the five-year period?

Research objectives

4. Calculate a consistent set of DuPont ratios for Apple and Microsoft for 2020-2024.
5. Compare profitability, asset-use efficiency, leverage, ROA, and ROE across both firms.
6. Identify which DuPont components account for the largest differences in observed ROE.
7. Demonstrate how financial statement decomposition improves interpretation of headline performance ratios.

The study is relevant to finance, accounting, auditing, and business analysis because ratio interpretation is used in investment analysis, credit assessment, management review, and analytical procedures. It also illustrates an appropriate role for artificial intelligence as a complementary research tool: AI can assist with brainstorming, structure, formula checking, and language review, while reported financial data, calculations, and source references remain independently traceable and reproducible.

Literature Review:

The DuPont framework is a long-established method of decomposing aggregate profitability into economically distinct drivers. Fairfield and Yohn (2001) examined the forecasting usefulness of profit margin and asset turnover and found that changes in these components can provide information about subsequent changes in profitability. Their findings support the logic of disaggregation: identical or similar top-level returns can reflect different underlying operating processes.

Nissim and Penman (2001) place ratio analysis within a broader equity-valuation framework. They argue that financial statement analysis is most useful when ratios are organized hierarchically and when operating and financing activities are separated. This perspective is directly relevant to DuPont analysis because ROE is not only a function of operating profitability; it is also affected by how assets are financed and by the amount of accounting equity supporting those assets.

Nissim and Penman (2003) further show that leverage should not be treated as a single homogeneous concept. Their analysis distinguishes financing leverage from operating liability leverage and demonstrates that leverage affects profitability measures and valuation relationships. For the present study, this literature provides the theoretical basis for interpreting a high equity multiplier carefully rather than treating a high ROE as evidence of superior operating economics by itself.

Soliman (2008) provides direct empirical support for the relevance of DuPont components to market participants. The study shows that the information contained in margin and turnover components is incremental to other accounting signals and that investors respond to the different properties of those components. This reinforces the central premise of the current project: a decomposed performance measure contains more decision-useful information than the undifferentiated ratio alone.

The primary financial disclosures used in this project are also part of the evidence base. Apple Inc. (2020, 2022, 2024) reports audited net sales, net income, total assets, and shareholders' equity for the fiscal periods required in the analysis. Microsoft Corporation (2020, 2022, 2024) provides the corresponding audited revenue, net income, total assets, and stockholders' equity data. Using company filings rather than third-party ratio websites reduces the risk of inconsistent definitions and allows each ratio to be reconstructed from published amounts.

Taken together, the literature establishes three propositions that guide the study. First, profitability should be decomposed into component drivers. Second, leverage materially affects shareholder returns and must be separated from operating performance. Third, primary financial statements

provide the appropriate base for a reproducible comparison. The present research applies these propositions to a focused Apple-Microsoft comparison over 2020-2024. Beyond traditional profitability and efficiency metrics, contemporary financial statement analysis increasingly recognizes that evaluating corporate performance requires contextualizing fundamental ratios within broader macroeconomic and predictive frameworks. To fully appreciate how different operating and financing models impact metrics like ROE, analysts must demonstrate technological analytic adeptness—such as employing vector autoregression—to examine how shifting macroeconomic variables interrelate with corporate capital structures (Bejjani, Toros, Elia, & Jabbour Al Maalouf, 2024). Furthermore, advanced machine learning techniques, including deep learning models and ensemble methodologies, are now frequently deployed to analyze complex asset returns and predict economic quadrants that directly influence how equity valuations react to profitability margins (Khalife, Yammine, El Bazi, Zaki, & Jabbour Al Maalouf, 2025; Nasser, Yammine, Harouny, & Khalife, 2025). The interpretation of financial leverage must also account for a firm's overarching business culture and resilience; fostering a data-driven environment enabled by business analytics significantly enhances product development and long-term organizational success, factors which directly underpin sustained asset turnover (Azoury, Subrahmanyam, & Sarkis, 2024). Similarly, robust corporate governance remains critical for maintaining transparent financial reporting and ensuring that profitability metrics accurately reflect economic realities rather than manipulated earnings, particularly during periods of macroeconomic distress (El-Chaarani, Abraham, Khalife, & Salameh-Ayanian, 2023; Saber & Sassine, 2022). Integrating artificial intelligence into these audit practices further revolutionizes the reliability of the consolidated financial statements upon which DuPont analysis depends (Sawaya, Khalil, Jabbour Al Maalouf, & Kaspard, 2026). Ultimately, utilizing smart decision support systems enables large technology firms to navigate the uncertainties of global operations effectively, ensuring that high ROEs derived from leverage do not compromise long-term sustainability (Subrahmanyam & Beainy, 2027; Subrahmanyam et al., 2024).

Methodology:

3.1 Research design and data sources

The study uses a quantitative, descriptive comparative design based entirely on secondary financial-statement data. The sample consists of two firms, Apple Inc. and Microsoft Corporation, observed for five fiscal years from 2020 through 2024, producing ten firm-year observations. Apple's fiscal year ends in September, while Microsoft's fiscal year ends in June. The analysis therefore compares each company's reported fiscal year rather than assuming perfectly synchronized calendar periods.

Financial inputs were taken from audited annual reports and Form 10-K filings. Apple data were obtained from the 2020, 2022, and 2024 Form 10-K filings; Microsoft data were obtained from the 2020, 2022, and 2024 annual reports. Because DuPont ratios based on average balance-sheet values require beginning balances, 2019 total assets and equity were collected solely to calculate 2020 average assets and average equity. All monetary amounts are expressed in U.S. dollars in millions.

3.2 Variable definitions and empirical model

The three-step DuPont identity decomposes return on equity into net profit margin, asset turnover, and the equity multiplier. Average balance-sheet values are used because revenue and net income are flow measures earned over the fiscal year, whereas assets and equity are point-in-time stocks.

Variable	Formula	Interpretation
Average assets	$(\text{Beginning assets} + \text{Ending assets}) / 2$	Average asset base employed during the year
Average equity	$(\text{Beginning equity} + \text{Ending equity}) / 2$	Average book capital attributable to shareholders
Net profit margin	$\text{Net income} / \text{Revenue}$	Profit earned per dollar of sales
Asset turnover	$\text{Revenue} / \text{Average assets}$	Sales generated per dollar of assets
Equity multiplier	$\text{Average assets} / \text{Average equity}$	Balance-sheet leverage applied to equity
Return on assets (ROA)	$\text{Net income} / \text{Average assets}$	Profit generated by the average asset base
Return on equity (ROE)	$\text{Net income} / \text{Average equity}$	Accounting return earned on average equity
DuPont identity	$\text{ROE} = \text{Margin} \times \text{Asset turnover} \times \text{Equity multiplier}$	Links operating performance and leverage to ROE

Table 1. Variable definitions and DuPont model

3.3 Analytical procedure

1. Extract revenue/net sales, net income, total assets, and total shareholders' equity for each firm-year from the audited filings.
2. Compute average assets and average equity using the beginning and ending balance for each fiscal year.
3. Calculate net profit margin, asset turnover, equity multiplier, ROA, and ROE using the formulas in Table 1.

4. Verify the internal identity $ROE = \text{net profit margin} \times \text{asset turnover} \times \text{equity multiplier}$ for every firm-year.
5. Compare annual values, five-year averages, and directional trends across the two companies.
6. Interpret the findings descriptively; no population-level statistical inference is claimed because the dataset contains only two purposively selected firms and five annual observations per firm.

3.4 Reliability, validity, and limitations of the method

Reliability is supported by using audited primary disclosures and by defining each formula explicitly so that the calculations can be independently reproduced. Construct validity is strengthened by using standard financial-analysis definitions rather than vendor-specific ratio measures. The principal methodological limitations are the small sample, the different fiscal year-end dates, accounting-policy and business-model differences, and the influence of share repurchases on book equity. The method also uses book values rather than market values and does not adjust financial statements for inflation, acquisitions, or nonrecurring items.

Results:

4.1 Financial statement inputs

Table 2 presents the reported financial statement inputs used in the calculations. The figures are stated in millions of U.S. dollars. The table contains only the five analysis years; 2019 beginning balances were used in the calculations but are not treated as an analysis period.

Firm	Year	Revenue / Net sales	Net income	Ending assets	Ending equity
Apple	2020	274,515	57,411	323,888	65,339
Apple	2021	365,817	94,680	351,002	63,090
Apple	2022	394,328	99,803	352,755	50,672
Apple	2023	383,285	96,995	352,583	62,146
Apple	2024	391,035	93,736	364,980	56,950
Microsoft	2020	143,015	44,281	301,311	118,304
Microsoft	2021	168,088	61,271	333,779	141,988
Microsoft	2022	198,270	72,738	364,840	166,542
Microsoft	2023	211,915	72,361	411,976	206,223
Microsoft	2024	245,122	88,136	512,163	268,477

Table 2. Financial statement inputs, fiscal 2020-2024 (USD millions)

4.2 DuPont ratios by firm and year

Firm	Year	Margin	Asset turnover	Equity multiplier	ROA	ROE
Apple	2020	20.91%	0.83x	4.25x	17.33%	73.69%
Apple	2021	25.88%	1.08x	5.25x	28.06%	147.44%
Apple	2022	25.31%	1.12x	6.19x	28.36%	175.46%
Apple	2023	25.31%	1.09x	6.25x	27.50%	171.95%
Apple	2024	23.97%	1.09x	6.03x	26.13%	157.41%
Microsoft	2020	30.96%	0.49x	2.66x	15.06%	40.14%
Microsoft	2021	36.45%	0.53x	2.44x	19.30%	47.08%
Microsoft	2022	36.69%	0.57x	2.26x	20.82%	47.15%
Microsoft	2023	34.15%	0.55x	2.08x	18.63%	38.82%
Microsoft	2024	35.96%	0.53x	1.95x	19.07%	37.13%

Table 3. DuPont decomposition and return measures

Across all five years, Microsoft's net profit margin exceeded Apple's. Microsoft's margin ranged from 30.96% to 36.69%, while Apple's ranged from 20.91% to 25.88%. The result indicates that Microsoft converted a larger proportion of each revenue dollar into net income throughout the study period.

Apple, however, generated materially higher asset turnover. Apple's asset turnover increased from 0.83x in 2020 to approximately 1.09x in 2024 and exceeded 1.08x in each year from 2021 onward. Microsoft's asset turnover remained between 0.49x and 0.57x. Thus, Apple produced more revenue per dollar of average assets despite Microsoft's higher profit margin.

The largest structural difference appears in the equity multiplier. Apple's multiplier rose from 4.25x in 2020 to a peak of 6.25x in 2023 and remained 6.03x in 2024. Microsoft's multiplier moved in the opposite direction, declining from 2.66x in 2020 to 1.95x in 2024. This means that Apple's average asset base was supported by substantially less book equity relative to assets than Microsoft's, which mechanically magnified Apple's ROE.

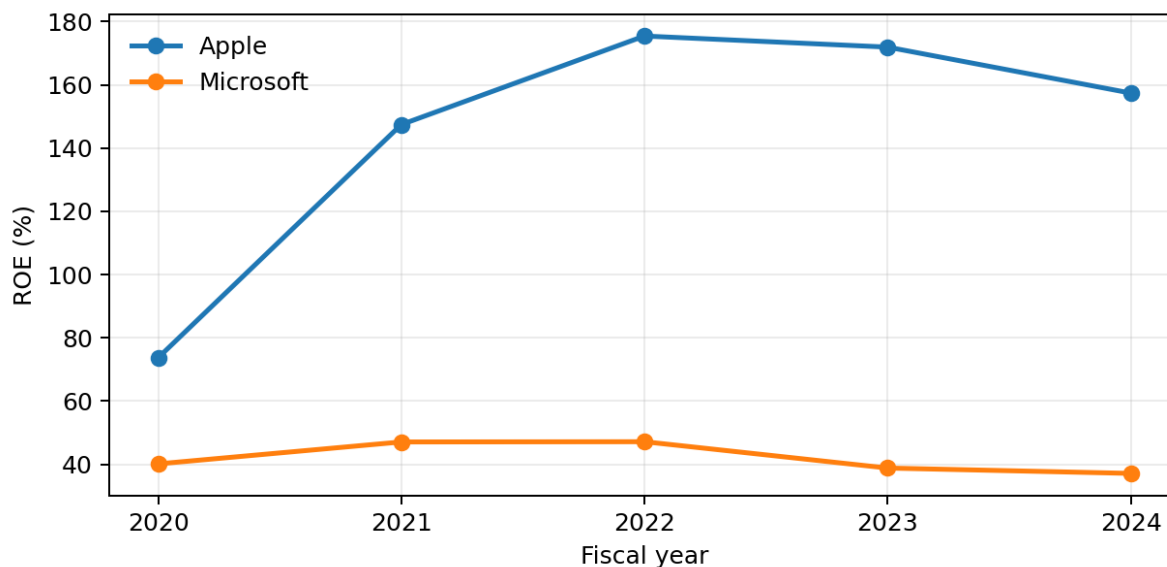


Figure 1. Return on equity, 2020-2024

Figure 1 shows that Apple's ROE was higher in every year. Apple's ROE increased from 73.69% in 2020 to 175.46% in 2022, then moderated to 157.41% in 2024. Microsoft's ROE stayed in a narrower range, from 37.13% to 47.15%. The gap is therefore large and persistent, but the decomposition in Table 3 shows that the difference is not explained by margin alone.

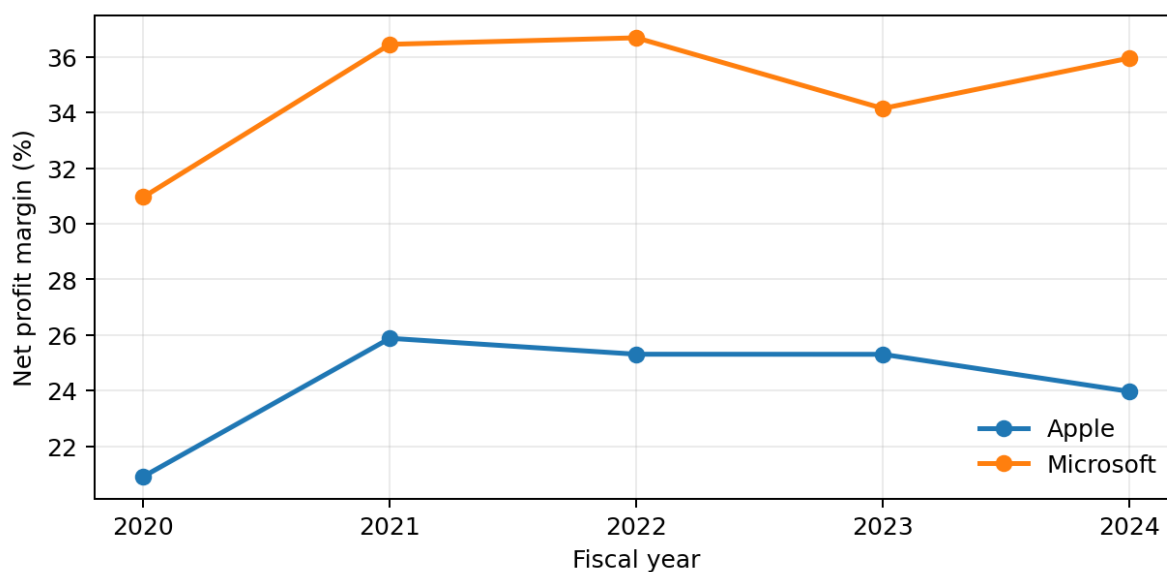


Figure 2. Net profit margin, 2020-2024

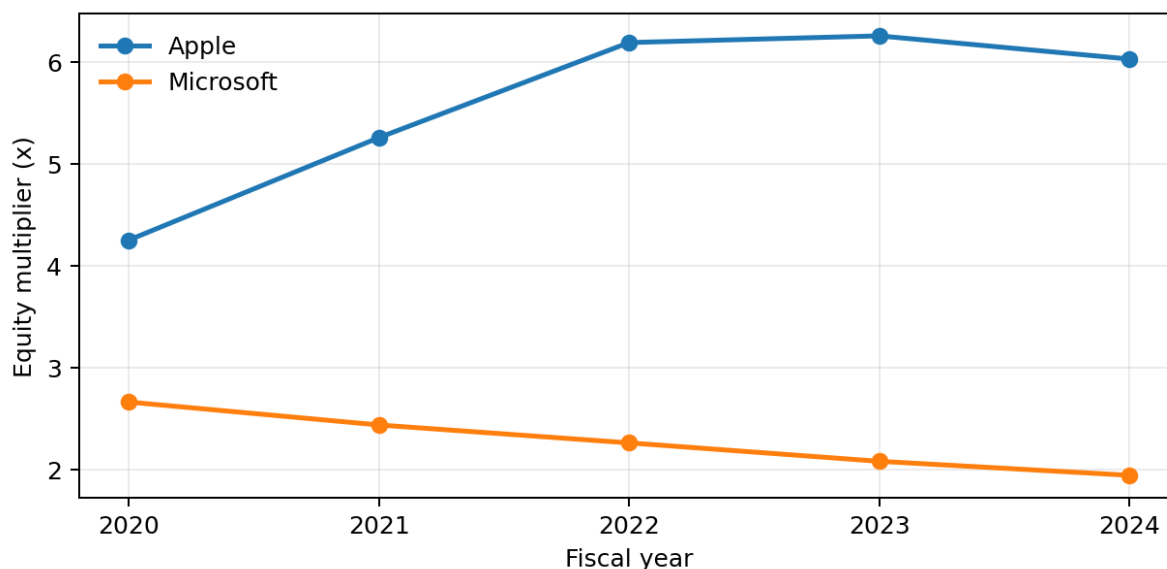


Figure 3. Equity multiplier, 2020-2024

4.3 Five-year comparison

Firm	Avg. margin	Avg. asset turnover	Avg. equity multiplier	Avg. ROA	Avg. ROE
Apple	24.28%	1.04x	5.59x	25.48%	145.19%
Microsoft	34.84%	0.53x	2.28x	18.58%	42.07%

Table 4. Five-year average DuPont metrics

On a five-year average basis, Microsoft recorded the higher net profit margin: 34.84% compared with Apple's 24.28%. Apple recorded the higher average asset turnover, 1.04x compared with 0.53x, and the higher average equity multiplier, 5.59x compared with 2.28x. These components produced an average ROA of 25.48% for Apple and 18.58% for Microsoft, while average ROE was 145.19% for Apple and 42.07% for Microsoft.

The evidence directly answers the research questions. Apple produced the higher ROE throughout 2020-2024, but Microsoft produced the higher profit margin throughout the same period. Apple's higher ROE is associated with both stronger asset turnover and, most prominently, a much higher equity multiplier. The data therefore show why a headline ROE comparison is incomplete: Microsoft's operating margin advantage and Apple's ROE advantage coexist because the two firms have different efficiency and capital-structure profiles.

4.4 Reproducibility check: 2024 worked example

For Apple in 2024, average assets equal $(\$352,583 \text{ million} + \$364,980 \text{ million}) / 2 = \$358,781.5$ million and average equity equals $(\$62,146 \text{ million} + \$56,950 \text{ million}) / 2 = \$59,548.0$ million. Net profit margin is $\$93,736 / \$391,035 = 23.97\%$; asset turnover is $\$391,035 / \$358,781.5 =$

1.0899x; and the equity multiplier is $\$358,781.5 / \$59,548.0 = 6.0251x$. Multiplying the three components gives approximately 157.41%, which equals $\$93,736 / \$59,548.0$.

For Microsoft in 2024, average assets equal $(\$411,976 \text{ million} + \$512,163 \text{ million}) / 2 = \$462,069.5 \text{ million}$ and average equity equals $(\$206,223 \text{ million} + \$268,477 \text{ million}) / 2 = \$237,350.0 \text{ million}$. Net profit margin is $\$88,136 / \$245,122 = 35.96\%$; asset turnover is $\$245,122 / \$462,069.5 = 0.5305x$; and the equity multiplier is $\$462,069.5 / \$237,350.0 = 1.9468x$. Their product equals approximately 37.13%, matching $\$88,136 / \$237,350.0$.

Discussion and Conclusion:

This research applied the three-step DuPont model to Apple and Microsoft over fiscal years 2020-2024 in order to determine what drove their reported returns on equity. The results show a consistent contrast. Microsoft generated the stronger net profit margin in every year, while Apple generated higher asset turnover and operated with a substantially higher equity multiplier. Apple therefore reported much higher ROE despite Microsoft's stronger margin performance.

The central implication is that ROE should not be interpreted in isolation. A high ROE may reflect genuine operating strength, efficient asset use, a reduced book-equity base, leverage, share repurchases, or a combination of these factors. For analysts, managers, auditors, and students, DuPont decomposition provides a disciplined way to separate those mechanisms. In this sample, the method prevents the incorrect conclusion that Apple's higher ROE necessarily means that Apple earned a higher percentage profit on sales; the data show the opposite on margin, while efficiency and leverage account for the rest of the difference.

Practically, the findings suggest that performance reviews should present ROE together with margin, turnover, and leverage measures. Theoretically, the study is consistent with prior research showing that disaggregated profitability measures contain economically distinct information. The analysis also illustrates how audited annual reports can be transformed into a reproducible empirical dataset using transparent formulas rather than relying on precomputed ratios from third-party websites.

Several limitations should be recognized. The study covers only two firms and five fiscal years, so the results are descriptive and should not be generalized to the technology sector as a whole. Apple and Microsoft have different fiscal year-ends and different business mixes. Book equity can also be materially affected by share repurchases, making the equity multiplier particularly sensitive to capital-return policy. Finally, the model does not adjust for market values, inflation, acquisition effects, or nonrecurring accounting items.

Future research could extend the sample to a larger group of technology firms, separate operating leverage from financing leverage in greater detail, test whether changes in DuPont components predict future profitability, and compare book-based findings with market-based valuation measures. A longer panel could also support formal statistical testing rather than descriptive comparison alone.

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