

# AN EVALUATION OF THE EFFICACY OF FINANCIAL PERFORMANCE MEASUREMENT METRICS AND THEIR IMPACT ON THE LONG-TERM FINANCIAL SUSTAINABILITY OF JSE-LISTED COMPANIES

**Philip Aiyepola**

*Unisa School of Accounting Science*

**Felix Chirairo**

*University of South Africa*

**Mduduzi Moyo**

*University of South Africa*

## ABSTRACT

**Purpose:** *This study critically evaluates the diagnostic power of conventional financial ratios in predicting the long-term financial sustainability of major corporations. It addresses the persistent empirical anomaly where firms with ostensibly healthy reported ratios experience failure, investigating the proposition that Free Cash Flow (FCF) represents a more robust metric of underlying economic health. The primary objective is to identify which, if any, traditional performance measurement categories demonstrate a significant empirical relationship with FCF generation.*

**Design/Methodology/Approach:** *Employing a quantitative, deductive research design, the study analyzes a ten-year (2015-2024) panel dataset of the Top 40 companies listed on the Johannesburg Stock Exchange (JSE). Financial data was sourced from the audited disclosures in the IRESS database. A mixed fixed effects panel regression model was utilized to examine the relationship between a comprehensive set of financial ratios—spanning profitability, liquidity, solvency, activity, and market valuation and free cash flow, while controlling for unobserved firm heterogeneity and temporal macroeconomic effects.*

**Findings:** *The correlation and regression analyses reveal a profound disconnect. The vast majority of conventional financial ratios, including key profitability (Operating profit margin, return on equity) and liquidity (current ratio) metrics, show weak or statistically insignificant associations with free cash flow. The panel regression identifies only two primary determinants with significant explanatory power: The debt-to-assets ratio (negative effect,  $\beta=-0.01655$ ,  $p<0.05$ ) and assets per capital employed (negative effect,  $\beta=-0.00109$ ,  $p<0.05$ ). This indicates that free cash flow generation is predominantly influenced by capital structure decisions and asset intensity, rather than by accounting profitability or short-term liquidity.*

**Originality/Value:** *This research makes a significant empirical contribution by demonstrating that standard financial ratio analysis is an inadequate tool for assessing and projecting free cash flow, a paramount indicator of financial sustainability. It provides robust, methodology-strong evidence from a leading emerging market, shifting the focus of sustainability assessment from income statement performance to balance sheet efficiency and financial structure. The findings compel a paradigm shift in corporate finance theory and practice, advocating for a cash-centric analytical framework over traditional profit-centric models.*

**Keywords:** Free Cash Flow, Financial Ratios, Financial Sustainability, Panel Regression, JSE, Performance Measurement, Capital Structure, Corporate Finance.

## 1. INTRODUCTION

The discipline of corporate finance operates on a foundational premise: That publicly disclosed financial statements, when distilled into standardized ratios, provide a reliable and sufficient diagnostic of an organization's health and trajectory. This premise underpins trillions in investment decisions, credit approvals

and strategic corporate planning globally (Damodaran, 2012). However, the persistent and often sudden failure of major, blue-chip corporations whose reported metrics ostensibly signaled stability exposes a critical and dangerous chasm between theoretical measurement capability and practical diagnostic utility (Berk & DeMarzo, 2023). This study, focusing on the top 40 companies listed on the Johannesburg Stock Exchange (JSE), launches a rigorous empirical investigation into this very chasm. It posits that the recurrent "empirical anomaly" of corporate collapse amidst healthy ratios is not an anomaly at all, but rather evidence of a systemic flaw in conventional performance measurement frameworks.

The article correctly identifies the crux of the issue: The susceptibility of accounting-based metrics to manipulation and their inherent focus on accruals rather than cash realities. Profitability ratios like operating margin or Return on Equity (ROE) can be inflated through discretionary accounting choices. Liquidity ratios like the current ratio can be temporarily massaged ahead of reporting dates. These metrics, while useful for cross-sectional comparison and trend analysis, may create a façade that obscures underlying cash flow fragility. In contrast, Free Cash Flow (FCF) defined as operating cash flow less essential capital expenditures stands as a theoretically superior metric. It represents the genuine economic surplus generated by the core operations, the cash truly available for discretionary use: Rewarding shareholders, reducing debt, or pursuing strategic opportunities without reliance on external financing. Its calculation is rooted in cash movements, offering greater resilience against accounting distortion. Therefore, the core investigative lens of this study is both powerful and necessary: to what extent do the conventional metrics we rely upon actually correlate with and predict this paramount indicator of financial sustainability, FCF?

The investigation is not merely an exercise in statistical correlation. It is a test of foundational beliefs in financial analysis. By employing panel regression analysis on a decade of data from South Africa's market leaders, it seeks to identify which, if any, traditional ratios possess "diagnostic robustness" through a statistically significant association with FCF. The outcomes challenge entrenched wisdom and make a formidable contribution to the literature on performance measurement, particularly within the context of emerging market giants.

### ***1.1. Problem statement***

The toolkit of finance has failed to predict some of its most significant disasters (McLean & Elkind, 2013). Companies like Steinhoff International, whose collapse devastated the JSE and beyond, exhibited financial ratios that did not fully telegraph the impending crisis (West, 2019). This "persistent and significant disconnect" is the core problem. It suggests that stakeholders that include investors, creditors, regulators, and directors, may be navigating with fundamentally flawed instruments. The problem is not a lack of data or sophistication, but a potential mis-specification in the models linking that data to the probability of survival and sustainable growth. Are we measuring what matters, or merely what is easily measurable? The focus on FCF as the benchmark for "actual" health reframes the problem from one of metric calculation to one of metric selection and validation.

### ***1.2. Objectives***

- Identify the performance measurement metrics that are used by companies in measuring financial sustainability.
- Examine the relationship between conventional financial ratios and free cash flow generation of JSE listed companies.
- Identify critical financial ratios that are significantly associated with free cashflows of JSE listed companies.

## **2. MATERIALS AND METHODS**

The methodology section outlines a robust quantitative and deductive approach, well-suited to the study's aims. The choice of a deductive approach is pivotal. It begins with the established theory that FCF is a superior measure of economic reality and that certain financial ratios, if they capture true economic

performance, should be correlated with it. The research then tests this theory against empirical data from the JSE Top 40.

**Data and sample selection:** The use of secondary data from the IRESS platform is a strength. Sourcing from a definitive database that relies on audited, mandatorily disclosed statements enhances reliability and replicability (Creswell & Creswell, 2018). The sample consisting of the JSE Top 40 from 2015 to 2024 is strategically chosen. These companies represent the apex of the South African economy; their financial practices are influential, their data is comprehensive, and their sustainability is of systemic importance. The hybrid cross-sectional and longitudinal design (panel data) is ideal, allowing the study to control for unobserved, time-invariant differences between firms (e.g., corporate culture, long-term strategic positioning) while analyzing changes over time (Bryman, 2016). The purposive sampling of this specific group is justified by their economic significance, though it explicitly limits generalizability to smaller listed or private firms (Bell et al., 2022).

### 3. RESULTS AND DISCUSSION

#### 3.1. Model

Fixed effects panel regression model is the methodological cornerstone of the study and represents a sophisticated application of econometrics to the research question. The model specification is:

$$FCF_{it} = \alpha_i + \beta_1 X_{it} + \gamma Z_i + \delta_t + \epsilon_{it} \quad (1)$$

Where,

- $FCF_{it}$  represents free cash flow for firm  $i$  at time  $t$ .
- $\alpha_i$  denotes firm-specific fixed effects capturing unobserved time-invariant firm heterogeneity.
- $X_{it}$  is a vector of time-varying financial ratios (which included activity ratios, investor ratios, liquidity ratios, profitability ratios, rate of return ratios and solvency ratios as described in Table 1).
- $Z_i$  represents time-invariant firm characteristics.
- $\delta_t$  are time fixed effects controlling for macroeconomic shocks and temporary trends.
- $\epsilon_{it}$  is the idiosyncratic error term, assumed to be independently and identically distributed.

This model's power lies in its controls which are as follows;

**Firm-specific fixed effects:** This controls for all inherent, unchanging characteristics of each company (e.g., its brand power, its regulatory environment, the innate risk of its industry). This is crucial. It means the model is not comparing a highly profitable technology firm to a capital-intensive miner; instead, it asks, "Within this specific mining company, do changes in its Debt/Assets ratio correlate with changes in its FCF over time?" This isolates the dynamic relationship.

**Time fixed effects:** This controls for macroeconomic shocks affecting all firms in a given year (e.g., the 2020 pandemic, shifts in the South African repo rate, global commodity price cycles in 2015-2016). This ensures that a year of universally low FCF is not incorrectly attributed to firm-specific ratio changes.

**Time-varying ratios:** These are the core variables of interest which include the financial ratios that change from year to year for each firm.

#### 3.2 Findings of the study

The findings are presented systematically and reveal a narrative that progressively dismantles the assumed authority of broad ratio categories.

The initial Spearman correlation analyses deliver a striking preliminary verdict. Across the board, whether examining activity, investor, liquidity, profitability, or return ratios, the associations with FCF are generally weak and not significant. This is a profound initial result. It suggests that at a simple bivariate level, there is no strong, consistent linear relationship between how the market values a company (P/E), how profitable it is (net margin), how liquid it appears (current ratio), or how efficiently it uses assets (total assets/turnover) and the actual free cash it generates. The few moderate correlations (e.g., with dividend cover and leverage factor) hint where the true drivers might lie: in payout policy and financial structure.

**The regression reveal: Structure over performance:** The mixed effects panel regression, controlling for firm and time, uncovers the nuanced truth. The type III tests and fixed effects estimates converge on a clear conclusion: The primary determinants of changes in free cash flow are not profitability or efficiency ratios, but measures of capital structure and asset intensity (Table 1).

**Assets per capital employed ( $\beta=-0.001092$ ,  $p<0.05$ ):** The significant negative coefficient reveals that higher capital intensity is a drag on FCF growth (Table 1). This finding aligns perfectly with fundamental finance theory (Brealey et al., 2020) which argues that asset-heavy business models require continuous, substantial capital expenditures simply to maintain operations, leaving a smaller residual cash surplus. It underscores that efficiency should be measured not just in sales per asset (activity), but in cash flow per unit of capital deployed.

**Debt-to-assets ratio ( $\beta=-0.016551$ ,  $p<0.05$ ):** The significant negative coefficient confirms the direct cash flow claim of debt (Table 1). Higher leverage, while potentially boosting ROE, imposes mandatory interest and principal payments. These are fixed cash outflows that reduce the "free" portion of operating cash flow. This quantifies the trade-off between leverage and financial flexibility. The finding is aligned with Jensen's free cash flow theory which directly explains and predicts the mechanism the finding reveals that debt structurally reduces free cash flow (Jensen, 1986).

**The marginal and the insignificant:** The marginal significance of debt/equity (positive) and ROE (positive) suggests secondary, less powerful relationships. Most critically, the study confirms that profitability (operating margin, net margin), operational efficiency (total assets/turnover), and market valuation (P/E) have no statistically significant effect on changes in FCF in this model. This finding provides robust empirical validation for the discounted cash flow valuation theory (Brealey et al., 2020), which holds that a firm's fundamental value is derived from its future free cash flows, not its reported accounting earnings.

**Table 1**  
**RESULTS OF THE ESTIMATES OF FIXED EFFECT PANEL REGRESSION MODEL**

Parameter	Estimate	Std. error	df	t	Sig	95% Confidence interval	
						Lower bound	Upper bound
Intercept	0.543497	0.986839	85.431	.551	.583	-1.418460	2.505455
Accounts Rcvb PerTover	-0.004802	0.010847	85.637	-.443	.659	-.026365	.016762
Cash flow per share	0.092319	.062703	250.093	1.472	.142	-.031174	.215812
Current ratio	0.003229	.014136	256.947	.228	.820	-.024608	.031065
Interest cover	-0.017354	.010575	80.095	-1.641	.105	-.038398	.003689
Operating profit margin	-0.022488	.014752	566.401	-1.524	.128	-.051464	.006488
Price per cash flow	-4.830E-05	.000541	4.735E3	-0.089	.929	-.001109	.001012
Retention rate	.010722	.010071	230.678	1.065	.288	-.009122	.030566
Total assets per turnover	-2.40E-05	.000102	82.519	-.236	.814	-.000227	.000179
Return on capital employed	-0.013156	.009429	183.076	-1.395	.165	-.031759	.005447
Assets per capital Emp	-0.001092	.000505	229.71	-2.162	.032	-.002088	-9.678542E-5
Debt per assets	-0.016551	.008240	169.13	-2.009	.046	-.032818	-.002932
Lever age factor	.003579	.004327	62.778	.827	.411	-.005068	.012227
Net profit margin	-.000142	.009984	236.875	-.014	.989	-.019811	.019527
Price per earnings	-8.95E-06	.000230	55.801	-0.039	.969	-.000469	.000451
Quick ratio	.001511	.022333	66.602	.068	.946	-.043070	.046092

Return on assets	-0.001287	.002140	205.445	-.601	.548	-.005506	.002932
Total debt per cash flow	.000323	.000806	185.919	.401	.689	-.001266	.001912
Cash flow into cover	.000193	.000907	113.832	.213	.832	-.001604	.001990
Debt per equity	20478	.011771	203.726	1.740	.083	-.002730	.043686
Dividend cover	-0.003687	.004670	59.325	-.790	.433	-.013031	.005656
Long term loans per total debt	.005719	.025079	328.204	.228	.820	-.043618	.055055
Return on equity	.003035	.001791	402.358	1.695	.091	-.000486	.006555

This is the study's core empirical revelation. It demonstrates that the engine of free cash flow generation operates on a different set of principles than the engine of accounting profit generation. A company can be highly profitable yet cash-poor if it is capital-intensive and heavily indebted. Conversely, a less profitable company with a lean asset base and modest debt might generate more sustainable FCF.

### 3.2. Contributions to knowledge

This study makes a multi-faceted and significant contribution to the academic and practical body of knowledge in corporate finance, particularly for emerging markets.

**Empirical validation of the cash flow superiority thesis in an emerging market context:** While the theoretical argument for FCF's superiority is long-established in textbooks (e.g., Damodaran, 2012), this study provides robust, contemporary empirical validation using a sophisticated methodology applied to a critical emerging market dataset. It moves the argument from "FCF is important in theory" to "Here is quantitative proof that traditional metrics fail to explain FCF in practice among major firms." This evidence is especially valuable for the JSE and similar markets, where investor sophistication and corporate governance are evolving.

**Identification of the true drivers: Capital allocation and financial structure:** The study's primary contribution is its precise identification of what does matter. By isolating assets per capital employed and debt/assets as the key significant variables, it shifts the focus of sustainability analysis from the income statement (profitability) to the balance sheet and cash flow statement (asset efficiency and financing decisions). It argues persuasively that long-term financial sustainability is less about maximizing a profit margin and more about optimizing the balance sheet for cash generation. This provides a clear, evidence-based mandate for managers and analysts to re-prioritize their focus.

**Revealing the diagnostic inadequacy of broad ratio categories:** The study contributes a critical caution. It demonstrates that entire categories of ratios such as liquidity and profitability can exhibit weak or no explanatory power for a key outcome variable. This challenges the standard, checklist approach to financial analysis, where a "good" score across multiple ratio categories is assumed to indicate health. The research implies that such an approach may provide false confidence, as it weights irrelevant signals.

**A methodological blueprint for future research:** The application of a mixed fixed effects panel regression model to this question is itself a contribution. It provides a replicable blueprint for other researchers to test these relationships in different markets, sectors, or with the inclusion of additional variables like macroeconomic indicators or governance scores. The study shows how to rigorously control for the unobservable heterogeneity that plagues cross-sectional studies in corporate finance.

In essence, the study contributes a paradigm of cash-centric sustainability. It argues that financial health is not a mosaic of accounting ratios but a function of a simple, cash-based equation: The efficiency of the asset base minus the burden of the financing structure. This paradigm challenges the incumbent profit-centric view and provides the empirical ammunition for its adoption.

## 4. CONCLUSION AND RECOMMENDATIONS

The conclusion powerfully synthesizes the findings into a "paradox": FCF, a critical health measure, is

largely disconnected from the conventional diagnostic toolkit. This is only a paradox if one clings to the old paradigm. The study resolves it by showing that FCF generation is a distinct discipline—one of capital allocation and financial engineering, separate from operational profitability. The recommendations are the logical, practical output of the new paradigm and are as follows:

- **Strategic leverage management:** Actively reduce the debt/assets ratio where restrictive, refinance to longer maturities, and use equity for major projects. This directly addresses the primary negative driver identified.
- **Asset productivity maximization:** Conduct "asset utilization audits" to identify and improve or divest underperforming assets. This tackles the capital intensity driver.
- **Metric modernization:** Replace an over-reliance on traditional ratios with direct cash flow metrics (Cash conversion cycle, FCF margin) and a balanced view of leverage (using debt/equity as a complementary measure).
- **Working capital optimization:** A critical addition, focusing on the operational levers of cash: inventory, receivables, and payables.

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