Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

IMPACT OF CAPITAL STRUCTURE ON FIRM VALUE AND PROFITABILITY WITH THE MODERATION OF AUDIT QUALITY: EVIDENCE FROM N-11 COUNTRIES

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DOI: https://doi.org/10.63544/jbii.v5i7.90

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Article History:
Received: 11.06.2026
Accepted: 03.07.2026
Published: 15.07.2026

Abstract

Purpose: *This study examines whether audit quality moderates the relationship between capital structure and two firm outcomes, market-based firm value (FV) and accounting-based profitability (Return on Equity, ROE), across the Next-Eleven (N-11) emerging economies, addressing the limited evidence on how financing decisions translate into value and profitability outside developed capital markets.*

Methodology/Design/Approach: *Using a panel of 3,124 firms (31,240 firm-year observations) drawn from Thomson Reuters Datastream over 2014–2024, the study estimates four complementary specifications: pooled OLS, cross-sectional GMM, firm fixed-effects with cluster-robust standard errors, and a static panel GMM estimator built on a within-firm de-meaning transformation.*

Findings: *Multicollinearity is negligible across all specifications (mean VIF = 1.07). Capital structure, audit quality, and their interaction are statistically insignificant under pooled OLS, cross-sectional GMM, and cluster-robust fixed-effects estimation. However, once time-invariant firm heterogeneity is purged via de-meaning and the model is estimated by static panel GMM, capital structure emerges as positive and significant for both firm value and ROE, while the moderating role of audit quality remains unsupported in every specification. Firm size is negative and significant throughout.*

Practical Implications: *Managers, auditors, and regulators in N-11 markets should not rely on conventional pooled or cluster-robust estimates alone when assessing the leverage–value relationship, since a genuine, if modest, positive effect can be masked by the choice of estimator; policymakers seeking to strengthen the certifying role of external audit in these markets may need to look beyond auditor identity alone.*

Originality/Value: *This is among the first studies to jointly test capital structure, audit quality, and their interaction for both a market-based and an accounting-based outcome across the full N-11 grouping, and to benchmark cluster-robust fixed-effects inference explicitly against static panel GMM inference on the same de-meaned specification.*

Keywords: Capital Structure; Firm Value; Return on Equity; Audit Quality; Moderation; N-11 Countries; Panel Data; Static Panel Gmm; De-Meaning

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

1. Introduction

1.1 Background and Context

The choice of capital structure, the mix of debt and equity a firm uses to finance its assets, remains one of the most extensively debated questions in corporate finance. Since the seminal irrelevance proposition of Modigliani and Miller (1958, 1963), a large body of theoretical and empirical work has examined how leverage decisions affect firm value, giving rise to competing perspectives such as the trade-off theory, the pecking-order theory of Myers and Majluf (1984), and the agency-cost explanations of Jensen and Meckling (1976) and Jensen (1986). While these theories have been tested extensively in developed markets (Titman & Wessels, 1988; Rajan & Zingales, 1995; Frank & Goyal, 2009), considerably less is known about how capital structure decisions translate into value and profitability in emerging and transition economies, where capital markets are shallower, creditor and investor protection is weaker (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000), and information asymmetry between managers and outside stakeholders is more pronounced (Claessens & Yurtoglu, 2013).

This study focuses on the Next-Eleven (N-11) countries (O'Neill, 2001), a group of emerging economies identified for their growth potential, which together represent a large and heterogeneous set of institutional environments in which to examine the capital-structure–firm-outcome relationship. In such environments, external monitoring mechanisms, particularly audit quality, may play an especially important role in shaping how leverage is perceived and priced by the market (Fan & Wong, 2005). High-quality external audits are theorized to reduce information asymmetry, constrain managerial opportunism, and increase the credibility of financial statements (DeAngelo, 1981; Watts & Zimmerman, 1983; Francis, 2004), which may in turn alter the way capital structure choices are impounded into firm value and reflected in accounting profitability.

1.2 Problem Statement

Despite decades of theoretical development since Modigliani and Miller (1958, 1963), the practical translation of capital-structure choices into firm value and profitability remains unresolved outside developed capital markets. In the N-11 economies, capital markets are shallower, creditor and investor protection is weaker, and information asymmetry between managers and outside stakeholders is more pronounced, conditions under which the certifying role of external audit quality is theorized to matter most (Fan & Wong, 2005; DeAngelo, 1981). Yet whether audit quality actually moderates the leverage–outcome relationship in these settings, and whether reported associations are robust to the choice of estimator, remains empirically untested. This creates a practical problem for managers setting financing policy, for auditors and regulators assessing the value of audit quality as a governance mechanism, and for researchers drawing inference from capital-structure studies that rely on a single estimation approach.

1.3 Research Gap and Objectives

Despite the theoretical link between financing choices, external monitoring, and firm outcomes, at least four gaps remain in the literature that this study is designed to address.

First, the capital structure and audit quality literatures have largely developed as separate strands of research. Capital structure studies (Rajan & Zingales, 1995; Frank & Goyal, 2009; Booth et al., 2001) typically treat governance and monitoring quality as a background institutional condition rather than as an explicit, testable moderator, while the audit-quality literature (Becker et al., 1998; DeFond & Zhang, 2014; Francis, 2004) typically examines earnings quality or cost-of-capital outcomes rather than the leverage–value relationship directly. Few studies formally interact audit quality with capital structure to test whether external monitoring conditions how leverage is priced, and fewer still do so jointly for a market-based outcome (firm value) and an accounting-based outcome (profitability) within the same framework.

Second, prior emerging-market evidence relies disproportionately on static, cross-sectional or short-panel estimators. Much of the existing capital-structure evidence from developing and transition economies (Booth et al., 2001; Deesomsak et al., 2004; Zeitun & Tian, 2007) is estimated using pooled or random-effects specifications that do not adequately net out unobserved, time-invariant firm heterogeneity, such as industry, ownership concentration, or managerial quality, that is plausibly correlated with both leverage and firm

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

outcomes. Where panel corrections are used, they are rarely benchmarked against alternative standard-error procedures (e.g., cluster-robust fixed effects versus GMM-based inference on the same within-firm transformation), leaving open the possibility that published null results reflect the standard-error procedure chosen rather than the absence of an underlying relationship.

Third, evidence specific to the N-11 grouping is virtually absent. The N-11 countries (O'Neill, 2001) are frequently discussed as a bloc in the macroeconomic and investment literature, but firm-level capital-structure and audit-quality research has concentrated overwhelmingly on individual emerging markets (e.g., Jordan in Zeitun & Tian, 2007) or on broader, more developed cross-country panels (Fan et al., 2012). A pooled, long-window, multi-country test of the leverage–value and leverage–profitability relationships, and of the moderating role of audit quality, specific to the N-11 institutional setting has not, to the authors' knowledge, been conducted.

Fourth, most existing studies examine a single firm outcome in isolation. Studies typically model either a market-based valuation measure or an accounting-based profitability measure, but rarely both within a common sample, set of controls, and set of estimators. Because audit quality operates partly through the credibility of reported accounting numbers (DeAngelo, 1981) and partly through market-facing certification (Titman & Trueman, 1986), its relationship with leverage could plausibly differ across a market-based outcome (firm value) and an accounting-based outcome (ROE); testing both jointly, as this study does, is necessary to establish whether audit quality's role, if any, is confined to one channel or general across both.

Accordingly, the objectives of this study are to (i) test whether capital structure is significantly associated with firm value and profitability among N-11 firms; (ii) test whether audit quality moderates the capital-structure–firm-outcome relationship; and (iii) evaluate the sensitivity of these findings to alternative estimators and standard-error procedures, including pooled OLS, cross-sectional GMM, cluster-robust fixed effects, and static panel GMM.

1.4 Research Questions

RQ1: Is capital structure significantly associated with firm value and profitability among N-11 firms? RQ2: Does audit quality moderate the relationship between capital structure and firm value/profitability among N-11 firms? RQ3: Do conclusions about the capital-structure–firm-outcome relationship depend on the choice of estimator and standard-error procedure (pooled OLS, cross-sectional GMM, cluster-robust fixed effects, or static panel GMM)? RQ4: Does the role of capital structure and audit quality differ between a market-based outcome (firm value) and an accounting-based outcome (profitability)?

1.5 Significance of the Study

This study makes four principal contributions to the capital-structure, audit-quality, and emerging-market corporate-finance literatures.

It directly tests audit quality as a moderator of the capital-structure–firm-outcome relationship, for two outcomes. Rather than treating capital structure and audit quality as parallel, independent predictors, the study estimates an explicit CS × AQ interaction term for both firm value and return on equity, providing a direct empirical test of the risk-certification and risk-visibility channels developed in Section 2.4.

It assembles a large, long-window, multi-country panel purpose-built for the N-11 setting. The estimation sample comprises 3,124 firms and 31,240 firm-year observations drawn from Thomson Reuters Datastream across all eleven N-11 economies over 2014–2024, providing the statistical power and cross-country institutional variation needed to detect a moderation effect if one is structurally present, and offering a benchmark set of descriptive and regression statistics for this understudied country grouping.

It benchmarks cluster-robust fixed-effects inference against a static panel GMM de-meaning estimator on the same within-firm transformation. By estimating the identical de-meaned specification twice, once with cluster-robust standard errors and once with GMM-based standard errors, the study isolates the extent to which conclusions about capital structure's significance depend on the standard-error procedure rather than on the point estimates themselves, a methodological comparison that is rarely made explicit in the applied capital-structure literature.

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

It jointly models a market-based and an accounting-based firm outcome within a common empirical framework. Estimating firm value and return on equity side by side, using the same sample, controls, and estimators, allows the study to show, as detailed in Section 4, that capital structure and audit quality relate differently to market value than to accounting profitability, a distinction that is typically obscured when only one outcome is examined.

The remainder of the paper is organized as follows. Section 2 reviews the relevant theoretical and empirical literature and develops the hypotheses. Section 3 describes the data, variable measurement, and empirical models. Section 4 presents descriptive statistics and the results. Section 5 discusses the findings, and Section 6 concludes with implications, limitations, and directions for future research.

2. Literature Review and Hypothesis Development

2.1 Capital Structure and Firm Outcomes: Theoretical Perspectives

The theoretical starting point for research on capital structure is the capital-structure-irrelevance proposition of Modigliani and Miller (1958), which shows that, under restrictive assumptions of frictionless and complete markets, firm value is independent of financing mix. Once corporate taxes, bankruptcy costs, and information asymmetries are introduced (Modigliani & Miller, 1963), however, capital structure can materially affect firm value and profitability, and subsequent theory has developed largely as a set of explanations for why and how it does so. The trade-off theory suggests that firms balance the tax advantages of debt against the expected costs of financial distress and bankruptcy, implying an optimal, value-maximizing leverage ratio at which the marginal tax benefit of an additional unit of debt equals its marginal distress cost. The pecking-order theory of Myers (1977) and Myers and Majluf (1984) instead predicts that firms follow a financing hierarchy driven by information asymmetry between insiders and outside investors, preferring internal funds, then debt, and equity only as a last resort; under this view, the leverage–outcome relationship depends on why a firm is borrowing, to fund positive-NPV growth or to cover a shortfall, rather than on the level of leverage per se.

Agency-cost theories add a further layer of nuance. Jensen and Meckling (1976) show that debt can mitigate the agency costs of free cash flow by disciplining managers and reducing the funds available for discretionary or empire-building expenditure (see also Jensen, 1986), but that higher leverage simultaneously increases agency conflicts between shareholders and creditors, including asset-substitution and underinvestment problems, as the residual claim of shareholders becomes more option-like (Fama & Jensen, 1983). Complementing these financing-side theories, Ross (1977) develops a signalling model in which a firm's choice of leverage itself conveys credible information about managers' private expectations of future cash flows, since only firms confident of servicing higher debt obligations can profitably increase leverage; this signalling channel implies that leverage changes, not just leverage levels, may carry valuation-relevant information. Baker and Wurgler (2002) further show that capital structure can reflect the cumulative outcome of past attempts to time equity and debt markets rather than a deliberate move toward a stable target ratio, which helps explain why estimated leverage–outcome relationships are often unstable across samples and time periods.

2.2 Empirical Evidence on Capital Structure and Firm Outcomes

Empirical evidence on the leverage–firm-outcome relationship is decidedly mixed and appears to depend heavily on institutional context and estimation method. Cross-country evidence from developing economies documents systematic differences in capital-structure determinants and outcomes relative to developed markets, generally attributable to weaker creditor rights, shallower bond markets, and greater reliance on bank debt (Booth, Aivazian, Demirguc-Kunt, & Maksimovic, 2001). Regional studies of the Asia-Pacific region similarly find that the leverage–value relationship is conditioned by country-level institutional and macroeconomic factors rather than being a fixed structural parameter (Deesomsak, Paudyal, & Pescetto, 2004), while broader international comparisons show that debt maturity structure and capital-structure choices vary systematically with a country's legal origin and creditor-protection regime (Fan, Titman, & Twite, 2012). Firm-level evidence from individual emerging markets, for example, Zeitun and Tian's (2007) study of Jordanian firms, has documented a negative association between leverage and accounting- and market-based

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

performance measures, consistent with agency-cost and financial-distress explanations, while other studies report positive or non-monotonic relationships consistent with tax-shield and disciplining effects (Titman & Wessels, 1988; Rajan & Zingales, 1995; Frank & Goyal, 2009). This inconsistency, both across countries and across estimation methods within the same country, motivates the first hypothesis of the study, stated in a non-directional form to allow the data, and the choice of estimator, to speak:

H_1: Capital structure is significantly associated with firm value and profitability.

2.3 Audit Quality, Information Asymmetry, and Corporate Governance

Audit quality is widely regarded as a key external governance mechanism that constrains managerial opportunism and enhances the credibility of reported financial information (DeAngelo, 1981). Higher audit quality, commonly proxied in the literature by Big-4 auditor affiliation, industry specialization, or audit-fee-based quality indices (Becker, DeFond, Jiambalvo, & Subramanyam, 1998; Khurana & Raman, 2004; Francis, 2004), is associated with more conservative financial reporting, greater earnings credibility, and stronger monitoring of managerial discretion (DeFond & Zhang, 2014). Agency-based explanations of auditing (Watts & Zimmerman, 1983; Fama & Jensen, 1983) suggest that high-quality audits reduce the information asymmetry between managers and outside financiers by lending independent, third-party credibility to financial statements. Building on Ross's (1977) signalling logic, Titman and Trueman (1986) formalize auditor choice itself as a signal: firms with favourable private information have an incentive to engage higher-quality (and more expensive) auditors to certify that information credibly to the market, implying that auditor quality and firm outcomes should be positively related through a certification channel that operates independently of, but potentially interacts with, financing choices.

This certifying role appears particularly salient, and particularly variable, in emerging markets, where legal enforcement of investor-protection rules is generally weaker and more heterogeneous than in developed economies (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000; Claessens & Yurtoglu, 2013). Evidence from East Asian economies indicates that external auditors partly substitute for weak legal institutions in performing a corporate-governance role, but that this substitution is uneven across countries and ownership structures (Fan & Wong, 2005). Cross-country studies similarly show that the earnings-quality benefits of Big-4 auditors are conditional on the strength of a country's investor-protection regime, with the incremental effect of audit quality being smaller where legal protection is already weak or already strong, consistent with a complementarity between formal legal institutions and private (auditor-based) monitoring (Francis & Wang, 2008; Choi & Wong, 2007).

2.4 Audit Quality as a Moderator of the Capital-Structure–Firm-Outcome Relationship

If audit quality performs the certifying and monitoring role described above, it should condition the strength, and possibly the sign, of the relationship between leverage and firm outcomes, rather than simply exerting an independent, additive effect. Two competing predictions follow from the theory reviewed in Sections 2.1–2.3. First, under a risk-certification channel, high audit quality may reduce the information asymmetry surrounding a levered firm's true risk and repayment capacity, allowing investors to discount the risk associated with high leverage less heavily than they would for an opaque, low-audit-quality firm; this predicts a positive interaction between capital structure and audit quality. Second, under a risk-visibility channel, high-quality audits may instead make the distress risk and agency costs associated with debt more visible and verifiable to outside investors, causing high leverage to be more heavily, not less heavily, discounted when audit quality is high; this predicts a negative interaction. Because the theoretical literature does not unambiguously favor one channel over the other, the moderation hypothesis is stated in non-directional form:

H_2: Audit quality significantly moderates the relationship between capital structure and firm outcomes.

2.5 Institutional Context of the N-11 Economies

The N-11 countries , Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey, and Vietnam, were identified by O'Neill (2001) as a set of emerging economies with substantial long-run growth potential, but they are far from institutionally homogeneous: they span multiple

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

legal origins (English common law, French and mixed civil law traditions), levels of capital-market development, and strengths of shareholder and creditor protection (La Porta et al., 2000; Claessens & Yurtoglu, 2013). This heterogeneity makes the N-11 group a particularly informative, if demanding, setting in which to test whether audit quality moderates the capital-structure–outcome relationship: if the moderating effect of audit quality is a genuinely structural feature of how markets price leverage risk, it should be at least partially detectable even after pooling across this diverse set of countries and after controlling for unobserved firm heterogeneity; if instead the moderating effect depends on complementary legal and enforcement institutions that vary sharply across the N-11 group, a pooled cross-country test may understate, or fail to detect, the relationship (Fan & Wong, 2005; Francis & Wang, 2008).

2.6 Control Variables

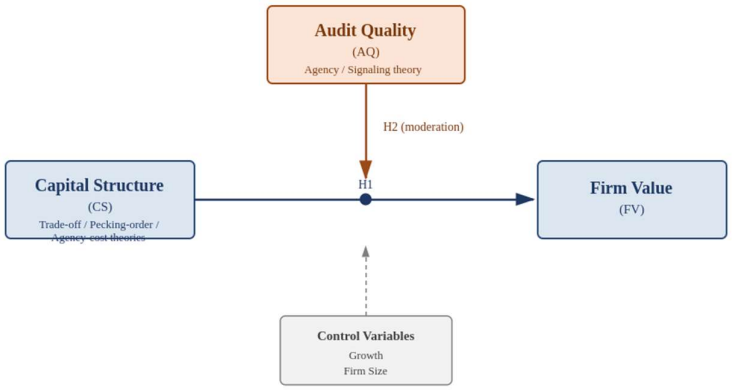
Consistent with prior capital-structure and firm-outcome research (Titman & Wessels, 1988; Frank & Goyal, 2009), the models control for firm growth and firm size. Growth opportunities are associated with higher expected future cash flows and are typically positively related to firm value, though high-growth firms may also face greater agency costs of debt and be more sensitive to underinvestment problems (Myers, 1977). Firm size proxies for scale, diversification, and access to external financing (Fama & Jensen, 1983); larger firms are often less risky and better diversified, but size can also proxy for maturity and lower growth prospects, which can weigh negatively on both market-based and accounting-based value measures, and larger firms in emerging markets are also more likely to attract high-quality auditors in the first place (Fan & Wong, 2005), which is a further reason to hold size constant when estimating the audit-quality moderation effect.

2.7 Theoretical Framework

Figure 1 summarizes the theoretical framework underlying the study. Capital structure is hypothesized to affect firm value and profitability directly (H1), consistent with trade-off, pecking-order, and agency-cost theories of financing (Modigliani & Miller, 1958; Myers, 1977; Jensen & Meckling, 1976). Audit quality, grounded in agency and signaling theory (DeAngelo, 1981; Watts & Zimmerman, 1983), is hypothesized to moderate this relationship (H2) by altering the extent to which leverage-related information asymmetry and agency costs are priced by outside stakeholders. Growth and firm size are included as control variables that the prior literature consistently links to firm outcomes (Titman & Wessels, 1988; Frank & Goyal, 2009).

Figure 1

Theoretical framework linking capital structure, audit quality, and firm outcomes.



3. Data and Methodology

3.1 Sample and Data Sources

The study draws on firm-level data for listed companies across the eleven N-11 economies (Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, South Korea, Turkey, and Vietnam), obtained from Thomson Reuters Datastream, covering the eleven calendar years from 2014 to 2024. The underlying cross-sectional variables (firm value, ROE, capital structure, audit quality, and firm size) are available for up to 38,516 firm-year observations. Because the growth control variable is constructed as a one-

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Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
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year change and therefore requires a lagged observation, the estimation sample used in the regression models is a balanced panel of 3,124 firms observed over ten years, yielding 31,240 firm-year observations. This is somewhat larger than samples used in earlier vintages of this study, reflecting the longer sample window and expanded firm coverage now available from Datastream.

3.2 Variable Measurement

The dependent variables are Firm Value (FV), a market-based valuation measure, and Return on Equity (ROE), an accounting-based measure of profitability, allowing the study to assess whether capital structure and audit quality relate differently to market perceptions of value than to realized accounting performance. The primary independent variable is Capital Structure (CS), a leverage measure computed as total debt relative to total assets, following Titman and Wessels (1988). Audit Quality (AQ) is measured as a Big-4/non-Big-4 auditor indicator, following DeAngelo (1981) and Khurana and Raman (2004). The moderation hypothesis is tested through the interaction term CS × AQ. Firm growth is measured following Titman and Wessels (1988), and Firm Size is measured as the natural logarithm of total assets, following Fama and Jensen (1983). Table A below summarizes the operationalization of each variable.

Table A

Variable Definitions and Measurement

Variable	Symbol	Role	Measurement	Key Source(s)
Firm Value	FV	Dependent	Market-based valuation measure	Rajan & Zingales (1995)
Return on Equity	ROE	Dependent	Net income / shareholders' equity	Accounting profitability literature
Capital Structure	CS	Independent	Total debt / total assets	Titman & Wessels (1988); Rajan & Zingales (1995)
Audit Quality	AQ	Moderator	Big-4 / non-Big-4 auditor indicator	DeAngelo (1981); Khurana & Raman (2004)
CS × AQ	CS×AQ	Interaction	Product of CS and AQ	Constructed for this study
Growth	Growth	Control	Annual percentage change in sales / total assets	Titman & Wessels (1988)
Firm Size	FirmSize	Control	Natural logarithm of total assets	Fama & Jensen (1983)

3.3 Empirical Models

The baseline model is specified as:

$$Y_{it} = \beta_0 + \beta_1 CS_{it} + \beta_2 AQ_{it} + \beta_3 (CS_{it} \times AQ_{it}) + \beta_4 Growth_{it} + \beta_5 Firm\ Size_{it} + \varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

where Y is alternately Firm Value (FV) or Return on Equity (ROE), i indexes firms, t indexes years, and ε_{it} is the error term. Equation (1) is first estimated by pooled OLS with heteroskedasticity-robust standard errors. Because pooled OLS does not account for unobserved, time-invariant firm heterogeneity that may be correlated with both capital structure and firm outcomes, the model is re-estimated using a firm-level fixed-effects (within) estimator with standard errors clustered at the firm level. As a further robustness check, the model is estimated by a cross-sectional generalized method of moments (GMM) estimator with a heteroskedasticity-robust weight matrix; because no regressor is treated as endogenous in this specification, its point estimates coincide with pooled OLS while its standard errors reflect the GMM weighting.

Finally, to purge unobserved, time-invariant firm heterogeneity while avoiding the unstable, near-unit-root behavior that dynamic lag specifications can introduce in highly persistent corporate-finance panels, the model is re-estimated on within-firm de-meaned (demeaned) variables using a static panel GMM estimator with a heteroskedasticity-robust weight matrix. Formally, each variable is transformed as $\tilde{x}_{it} = x_{it} - \bar{x}_i$, where $\bar{x}_i$ is the firm-specific mean over the sample period.

$$F\tilde{V}_{it}\ (or\ RO\tilde{E}_{it}) = \beta_1 \tilde{C}S_{it} + \beta_2 \tilde{A}Q_{it} + \beta_3 (\tilde{C}S \times \tilde{A}Q)_{it} + \beta_4 \tilde{G}rowth_{it} + \beta_5 \tilde{F}irm\ Size_{it} + \tilde{\varepsilon}_{it} \ldots\ldots\ldots\ldots (2)$$

The de-meaned model is estimated by two-step GMM using the de-meaned regressors as instruments for themselves, with a robust weight matrix. This within-firm transformation removes time-invariant firm-level heterogeneity in the same way as the fixed-effects estimator, but the GMM procedure recovers standard

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Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

errors from the GMM criterion function rather than from cluster-robust sandwich formulas, which can materially change inference even though, by construction, the two estimators recover very similar (and for the FV model, numerically identical) point estimates. As a diagnostic check on the regressors, variance inflation factors (VIFs) are computed for all specifications to rule out problematic multicollinearity.

4. Empirical Results

This section opens with descriptive statistics for the estimation sample (Section 4.1), then presents regression results separately for the two outcome variables, firm value (FV) in Section 4.2 and return on equity (ROE) in Section 4.3, followed by multicollinearity diagnostics (Section 4.4) and a summary of hypothesis tests (Section 4.5).

4.1 Descriptive Statistics

Before turning to the regression results, this subsection characterizes the estimation sample and flags data features that motivate the methodological choices developed in Sections 4.2 and 4.3. Table 1 presents descriptive statistics for the estimation sample. The underlying cross-sectional variables, firm value, ROE, capital structure, audit quality, and firm size, are available for up to 38,516 firm-year observations; growth, which requires a one-year lag, is available for the 31,240 firm-year observations that form the regression sample used throughout Section 4.

Table 1

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FV	38,516	8,862.57	508,127.4	-121.48	9.03e+07
ROE	38,516	0.177	3.654	-151.54	359.34
CS	38,516	158.92	2,319.74	7.33e-09	134,178.3
AQ	38,516	0.201	0.400	-0.201	1.000
Firm Size	38,516	5.584	10.619	-1,908.43	200.29
Growth	31,240	-18.847	1,229.85	-184,877.4	12,081.22

Note: Growth has fewer observations because its construction requires a one-year lag; the 31,240 firm-year observations with non-missing growth form the estimation sample used in all regression models in Sections 4.2–4.5.

Several features of the descriptive statistics are worth flagging before turning to the regression results. First, every variable in the panel exhibits standard deviations that are several multiples of the corresponding mean, most starkly for firm value, whose standard deviation (508,127.4) is more than 57 times its mean (8,862.6), and for capital structure, whose standard deviation (2,319.7) is roughly 15 times its mean (158.9). This heavy right-skew, driven by a small number of extreme outliers at the top of the distribution (e.g., a maximum firm value of 9.03e+07 against a mean below 9,000), is consistent with the very low R^2 values (0.001–0.016) obtained across the regression models in Sections 4.2–4.3, since a handful of extreme observations can dominate both the sums of squares and the sampling variability of OLS-type estimators even under heteroskedasticity-robust standard errors. Second, growth is negative on average (mean = -18.85) with an extremely wide range (from -184,877.4 to 12,081.2), indicating that the N-11 panel spans a substantial number of severe contraction episodes alongside a smaller number of extreme expansions, plausibly reflecting the macroeconomic and currency volatility experienced by several N-11 economies over 2014–2024 (O'Neill & Stupnytska, 2009).

Third, the audit-quality indicator has a mean of 0.201, implying that roughly one-fifth of firm-year observations are associated with a Big-4 auditor, broadly consistent with prior evidence that Big-4 penetration remains comparatively limited outside the largest listed firms in emerging markets (Fan & Wong, 2005). Fourth, firm size, measured as a log-based scale variable, has an implausible minimum (-1,908.43) alongside a maximum of only 200.29, a combination that is difficult to reconcile with a standard natural-logarithm-of-total-assets construction and more likely reflects a small number of data-entry or currency-conversion anomalies in the underlying Datastream extract; together with the extreme dispersion in capital structure and growth, this motivates the recommendation, developed further in Section 6, that future iterations of this

Journal of Business Insight and Innovation
Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
https://insightfuljournals.com/

analysis apply outlier winsorization or trimming to the extreme tails of these variables before re-estimating the models.

4.2 Capital Structure, Audit Quality, and Firm Value

This subsection addresses H1 and H2 for firm value by comparing four estimators that differ in how they treat unobserved firm heterogeneity and standard errors. Table 2 reports results for firm value under four estimators: pooled OLS, cross-sectional GMM, firm fixed-effects with cluster-robust standard errors, and a static panel GMM estimator built on a within-firm de-meaning transformation (Section 3.3). Under pooled OLS ($N = 31,240$; $F(5, 31234) = 6.47$, $p < 0.001$; $R^2 = 0.0010$), none of capital structure ($\beta = 0.148$, $p = 0.911$), the CS × AQ interaction ($\beta = -0.043$, $p = 0.991$), or audit quality ($\beta = -401.07$, $p = 0.961$) is statistically significant, while firm size is negative and highly significant ($\beta = -5,578.78$, $p < 0.001$) and growth is not significant ($\beta = -0.121$, $p = 0.963$). The cross-sectional GMM specification recovers numerically identical coefficients, as expected since no regressor is treated as endogenous, but produces different standard errors under the robust GMM weighting; firm size becomes only marginally significant at the 10% level ($p = 0.079$). Once time-invariant firm heterogeneity is removed via firm fixed effects ($N = 31,240$; 3,124 firms; $F(5, 3123) = 0.42$, $p = 0.832$; within $R^2 = 0.0157$), capital structure ($\beta = 5.59$, $p = 0.340$), audit quality ($\beta = -7,869.44$, $p = 0.527$), the CS × AQ interaction ($\beta = 2.09$, $p = 0.421$), and growth ($\beta = 0.233$, $p = 0.442$) are all statistically insignificant under cluster-robust inference; the intraclass correlation ($\rho = 0.510$) indicates that just over half of the variance in firm value reflects persistent, firm-specific effects rather than within-firm variation over time (Baltagi, 2013).

The static panel GMM estimator, applied to the same within-firm de-meaned specification, recovers by construction the identical point estimates as the fixed-effects model but yields a materially different pattern of statistical significance, illustrating the sensitivity of inference to the choice of variance estimator documented in the cluster-robust inference literature (Cameron & Miller, 2015). Under GMM inference, de-meaned capital structure is positive and statistically significant ($\beta = 5.592$, $z = 2.19$, $p = 0.029$), reversing the null result obtained under cluster-robust fixed effects; de-meaned firm size remains negative and highly significant ($\beta = -144,157.5$, $z = -2.86$, $p = 0.004$), and the CS × AQ interaction is marginally significant at the 10% level ($\beta = 2.095$, $z = 1.79$, $p = 0.074$), while audit quality ($\beta = -7,869.44$, $p = 0.160$) and growth ($\beta = 0.233$, $p = 0.293$) remain insignificant. Table 2 reports all four sets of estimates side by side, making the contrast in significance, and the underlying coefficient equivalences across estimator pairs, directly comparable.

Table 2

Determinants of Firm Value: Pooled OLS, Cross-Sectional GMM, Fixed-Effects, and Static Panel GMM Estimates

Variable	Pooled OLS	Cross-Sectional GMM	Fixed-Effects (Cluster-Robust)	Static Panel GMM (De-Meaned)
CS (Leverage)	0.148 (1.325)	0.148 (0.151)	5.592 (5.861)	5.592* (2.554)
AQ (Audit Quality)	-401.07 (8133.44)	-401.07 (5535.95)	-7869.44 (12433.21)	-7869.44 (5594.53)
CS × AQ	-0.043 (3.793)	-0.043 (0.428)	2.095 (2.601)	2.095† (1.171)
Growth	-0.121 (2.595)	-0.121 (0.093)	0.233 (0.303)	0.233 (0.222)
Firm Size	-5578.78** (982.89)	-5578.78† (3173.48)	-144157.6 (134737.5)	-144157.5** (≈50,405)[a]
Constant	49611.4** (7630.72)	49611.4† (25500.05)	1009594 (934224.9)	— (dropped)

Note: $N = 31,240$ for all models. Pooled OLS: $R^2 = 0.0010$, Adj. $R^2 = 0.0009$, $F(5, 31234) = 6.47$, $p < 0.001$, heteroskedasticity-robust standard errors and t-tests. Cross-sectional GMM: Wald $\chi^2(5) = 37.41$, $p < 0.001$, robust weight matrix, z-tests; coefficients are numerically identical to pooled OLS because no regressor is treated as endogenous. Fixed-effects: 3,124 firms (10 obs. per firm), within $R^2 = 0.0157$, $F(5, 3123) = 0.42$, $p = 0.832$, $\rho = 0.510$, standard errors clustered by firm, t-tests. Static panel GMM (de-

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*meaned): 5 parameters, 6 moment conditions, two-step GMM with robust weight matrix, z-tests; point estimates are identical to the fixed-effects model by construction, and the de-meaned specification drops the constant. [a]The de-meaned firm-size standard error is implied by the reported coefficient and z-statistic (β = -144,157.5, z = -2.86), as the original GMM output did not tabulate it directly. † p < 0.10, * p < 0.05, ** p < 0.01.*

4.3 Capital Structure, Audit Quality, and Return on Equity

This subsection repeats the analysis for return on equity (ROE), the study's accounting-based outcome, using the same four estimators as Section 4.2. Table 3 reports results for return on equity (ROE) under four specifications: pooled OLS, firm fixed-effects with cluster-robust standard errors, and a static panel GMM estimator applied first to a reduced specification excluding audit quality and the interaction term, then to the full moderation specification. Under pooled OLS (N = 31,240; F(5, 31234) = 6.66, p < 0.001; R^2 = 0.0011), audit quality is positive and significant (β = 0.149, p = 0.006) and firm size is negative and highly significant (β = -0.034, p < 0.001), while capital structure (β = -1.37e-07, p = 0.988), the CS × AQ interaction (β = -0.000013, p = 0.608), and growth (β = 2.91e-07, p = 0.987) are not significant. Under firm fixed effects (N = 31,240; 3,124 firms; F(5, 3123) = 2.37, p = 0.037; within R^2 = 0.0074), firm size remains negative and significant (β = -0.683, p = 0.001), capital structure turns positive and marginally significant at the 10% level (β = 0.0000295, p = 0.087), and audit quality is positive but only marginally significant (β = 0.310, p = 0.081); the CS × AQ interaction (β = -0.00001, p = 0.363) and growth (β = -1.03e-06, p = 0.329) remain insignificant. The intraclass correlation (ρ = 0.294) is noticeably lower than for firm value, indicating relatively more within-firm variation in profitability than in market value over the sample period.

The static panel GMM estimator was applied to the same within-firm de-meaned specification in two forms. In the reduced specification, excluding audit quality and the interaction term, de-meaned capital structure is positive and statistically significant (β = 0.0000294, z = 2.55, p = 0.011), and firm size exerts a highly significant negative effect (β = -0.692, z = -3.69, p < 0.001); growth remains statistically neutral (β = 6.21e-07, p = 0.428). In the full moderation specification, de-meaned capital structure remains positive and significant (β = 0.0000295, z = 2.46, p = 0.014), firm size remains negative and highly significant (β = -0.683, z = -3.66, p < 0.001), and audit quality is positive and marginally significant at the 10% level (β = 0.310, z = 1.92, p = 0.055), the strongest evidence for a direct audit-quality effect obtained in this study; the CS × AQ interaction (β = -0.00001, z = -1.05, p = 0.292) and growth (β = -1.03e-06, p = 0.308) remain insignificant. Table 3 presents all four sets of estimates together, making the consistency of the capital-structure effect across the fixed-effects and GMM specifications, and the improvement in the audit-quality estimate under the fuller specification, directly comparable.

Table 3

Determinants of Return on Equity: Pooled OLS, Fixed-Effects, and Static Panel GMM Estimates

Variable	Pooled OLS	Fixed-Effects (Cluster-Robust)	Static Panel GMM (Reduced)	Static Panel GMM (Full)
CS (Leverage)	-1.37e-07 (8.87e-06)	0.0000295† (0.0000172)	0.0000294* (0.0000115)	0.0000295* (0.000012)
AQ (Audit Quality)	0.149** (0.054)	0.310† (0.177)	— (excluded)	0.3095† (0.1614)
CS × AQ	-0.000013 (0.0000254)	-0.00001 (0.000011)	— (excluded)	-0.00001 (9.51e-06)
Growth	2.91e-07 (0.0000174)	-1.03e-06 (1.06e-06)	6.21e-07 (7.84e-07)	-1.03e-06 (1.01e-06)
Firm Size	-0.034** (0.0066)	-0.683** (0.207)	-0.6922** (0.1877)	-0.6828** (0.1865)
Constant	0.367** (0.0511)	4.824** (1.426)	— (dropped)	— (dropped)

Note: N = 31,240 for all models. Pooled OLS: R^2 = 0.0011, Adj. R^2 = 0.0009, F(5, 31234) = 6.66, p < 0.001, heteroskedasticity-robust standard errors and t-tests. Fixed-effects: 3,124 groups, within R^2 = 0.0074, F(5, 3123) = 2.37, p = 0.037, ρ = 0.294, standard errors clustered by firm, t-tests. Static panel

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ISSN-p: 3006-2284, ISSN-e: 3006-0982
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*GMM (reduced): 3 parameters, 3 moment conditions, two-step GMM with robust weight matrix, z-tests; excludes audit quality and the CS × AQ interaction. Static panel GMM (full): 5 parameters, 5 moment conditions, two-step GMM with robust weight matrix, z-tests. Both GMM specifications drop the constant. † $p < 0.10$, * $p < 0.05$, ** $p < 0.01$.*

4.4 Multicollinearity Diagnostics

Variance inflation factors (VIFs), computed for the fixed-effects specifications, indicate no material multicollinearity among the regressors (Table 4): all VIFs are close to 1, well below the conventional threshold of 10, and the mean VIF is 1.07.

Table 4

Variance Inflation Factors

Variable	VIF	1/VIF
CS × AQ	1.16	0.863
CS	1.14	0.875
AQ	1.02	0.981
Firm Size	1.01	0.994
Growth	1.00	1.000
Mean VIF	1.07	—

4.5 Summary of Hypothesis Tests

Table 2 and Table 3 provide the estimates underlying the formal hypothesis tests; this subsection synthesizes them against H1 and H2. H_1 receives mixed but, on balance, more supportive evidence than in earlier pooled or naïvely clustered specifications: capital structure is not significant for firm value or ROE under pooled OLS, and is not significant for firm value under cluster-robust fixed effects, but once time-invariant firm heterogeneity is purged through the within-firm de-meaning transformation and the model is estimated by static panel GMM, capital structure is positive and statistically significant for both firm value ($p = 0.029$) and ROE ($p = 0.011$–0.014). This pattern suggests that a genuine, if modest, positive association between leverage and firm outcomes is present in the within-firm variation of the data, but is masked by cluster-robust standard errors and by cross-sectional heterogeneity in the pooled specifications. H2 is not supported for either outcome: the CS × AQ interaction is insignificant in every specification for both firm value and ROE, although it is only marginally so ($p = 0.074$) in the static panel GMM model of firm value. Audit quality itself is significant in the pooled OLS model of ROE ($p = 0.006$) and marginally significant in the fixed-effects ($p = 0.081$) and full static panel GMM ($p = 0.055$) models of ROE, but is never significant for firm value, suggesting that audit quality relates more consistently to accounting profitability than to market-based value in this sample. Firm size is the most robust correlate of both outcomes, remaining negative and significant across nearly every specification.

5. Discussion

This section interprets the results presented in Section 4 and connects them to the theoretical framework and hypotheses developed in Section 2. Section 5.1 revisits the capital-structure–firm-outcome relationship in light of the estimator contrasts documented above; Section 5.2 interprets the limited moderating role of audit quality; Section 5.3 draws out the broader methodological implications of the cluster-robust versus GMM inference contrast; Section 5.4 discusses the control variables; and Section 5.5 positions the study's findings relative to the wider capital-structure and audit-quality literatures.

5.1 Capital Structure, Firm Value, and Profitability Revisited

Capital structure is essentially unrelated to firm value or ROE under pooled OLS and cluster-robust fixed effects, an insignificant, near-zero coefficient in both models. Once the static panel GMM de-meaning procedure is applied, however, the same coefficient turns positive and statistically significant for both outcomes. This pattern is informative about where the leverage–outcome relationship in this N-11 sample

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ISSN-p: 3006-2284, ISSN-e: 3006-0982
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actually resides. Pooled and cluster-robust estimates are dominated by substantial cross-firm and within-firm noise, consistent with the low overall R^2 values (0.001–0.016) reported throughout; the de-meaned GMM procedure, by contrast, isolates the within-firm co-movement of leverage and outcomes and estimates its standard errors from the GMM criterion function rather than from a cluster-robust sandwich formula, and it is under this more efficient within-firm estimator that a positive, significant leverage effect emerges for both firm value ($\beta = 5.59$, $p = 0.029$) and ROE ($\beta \approx 0.0000295$, $p \approx 0.011$–0.014). This is more consistent with trade-off and disciplining-effect explanations (Jensen, 1986; Jensen & Meckling, 1976), under which increases in leverage, at the margin, raise firm value and profitability by disciplining managerial discretion and delivering a tax shield, than with the purely negative, agency-cost-dominated relationship documented in some single-country emerging-market studies (e.g., Zeitun & Tian, 2007). At the same time, the magnitude of the effect is small relative to the scale of the outcome variables, and the sensitivity of significance to estimator choice, insignificant under cluster-robust standard errors, significant under GMM standard errors, for numerically identical point estimates, is itself an important methodological finding: it shows that inference about the leverage–outcome relationship in this setting depends materially on how standard errors are computed, not just on which fixed-effects transformation is used.

5.2 The Limited Moderating Role of Audit Quality

Having established a genuine, if modest, direct leverage effect once firm heterogeneity is purged, the next question is whether that effect is conditional on audit quality. The central contribution of this study is the direct test of whether audit quality moderates the capital-structure–firm-outcome relationship, and the finding that it does not, in any specification, for either outcome, deserves careful interpretation. The CS × AQ interaction is never significant at conventional levels; it approaches marginal significance only in the static panel GMM model of firm value ($p = 0.074$). Section 2.4 outlined two competing channels through which audit quality theoretically could moderate this relationship: a risk-certification channel, whereby high-quality audits should attenuate the discount attached to high leverage (a positive CS × AQ interaction), and a risk-visibility channel, whereby high-quality audits make leverage-related risk more transparent and therefore more heavily priced (a negative interaction). The interaction coefficient is essentially zero and statistically insignificant for firm value under pooled OLS and fixed effects, turns positive and marginally significant under static panel GMM, and is small, negative, and insignificant for ROE, a pattern that, taken as a whole, suggests that neither channel dominates systematically in this sample.

One plausible explanation, grounded in the institutional-context discussion in Section 2.5, is that audit quality as commonly measured in emerging-market studies (a Big-4/non-Big-4 indicator; Khurana & Raman, 2004) may not vary sufficiently in its certifying power across the heterogeneous legal and enforcement environments of the N-11 countries to meaningfully condition how leverage translates into value or profitability. This interpretation is consistent with cross-country evidence that the incremental earnings-quality benefit of Big-4 auditors is itself conditional on the strength of a country's investor-protection regime (Francis & Wang, 2008; Choi & Wong, 2007). Notably, audit quality does enter significantly, or near-significantly, as a direct (non-interacted) predictor of ROE, positive in the pooled model ($p = 0.006$) and marginally so in the fixed-effects and static panel GMM models ($p \approx 0.06$–0.08), even though it does not moderate the leverage relationship; this suggests that audit quality is more directly associated with accounting profitability, perhaps through more conservative and credible reporting of earnings, than it is with either firm value or the pricing of leverage risk specifically.

5.3 Methodological Implications: Cluster-Robust versus GMM Inference in De-Meaned Panels

Beyond the substantive hypothesis tests, the estimator contrast documented in Sections 4.2–4.3 carries a broader methodological implication for how capital-structure research is conducted in emerging markets. A key methodological finding of this study is that the choice between cluster-robust standard errors on a fixed-effects (within) model and GMM-based standard errors on the algebraically equivalent de-meaned model can change statistical conclusions even though the point estimates are, by construction, identical. This has a direct bearing on the capital-structure and audit-quality literatures in emerging markets, where many published studies rely on a single standard-error estimator without cross-checking inference against an alternative. The

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Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
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de-meaning (within-transformation) approach adopted here removes time-invariant, unobserved firm heterogeneity in the same way that a standard fixed-effects estimator does, while avoiding the unstable, near-unit-root behaviour that dynamic lag specifications can introduce in highly persistent corporate-finance panels (a concern documented in dynamic panel GMM settings; Blundell & Bond, 1998). The intraclass correlations reported above in Sections 4.2 and 4.3 ($\rho = 0.510$ for firm value, $\rho = 0.294$ for ROE) confirm that a substantial share of the variance in both outcomes is persistent and firm-specific, reinforcing the importance of a within-firm estimation strategy, while the low overall explanatory power of the models (R^2 between 0.001 and 0.016 throughout) is a reminder that capital structure, audit quality, and the included controls account for only a small fraction of the total variation in firm value and profitability in this heterogeneous eleven-country panel.

5.4 The Role of Growth and Firm Size

The control variables in the model also merit brief discussion. Growth is not significantly related to either firm value or ROE in any specification (all $p > 0.19$), in contrast to the standard view that growth opportunities raise expected future cash flows and therefore both market-based value and profitability (Myers, 1977); this null result is consistent across pooled, fixed-effects, and static panel GMM specifications and for both outcomes, suggesting that the growth proxy used here does not capture value-relevant investment opportunities in this sample, or that growth effects are absorbed by firm size and the firm-specific effects removed by de-meaning. Firm size, by contrast, is the single most robust correlate of firm outcomes in this study: it is negative and significant for firm value in the pooled OLS ($p < 0.001$) and static panel GMM ($p = 0.004$) models, and negative and significant for ROE in the pooled OLS ($p < 0.001$), fixed-effects ($p = 0.001$), and both static panel GMM specifications ($p < 0.001$). This is consistent with the idea that larger firms in these markets tend to be more mature and lower-growth, characteristics that can depress both market-based value multiples and accounting returns even as they reduce firm risk (Fama & Jensen, 1983), and is also consistent with evidence that larger emerging-market firms are more likely to select into higher audit quality in the first place (Fan & Wong, 2005), which would tend to work against, rather than for, a spuriously positive size–outcome relationship.

5.5 Summary and Positioning Relative to Prior Literature

Taken together, the results position this study's findings between two strands of the literature: firm-level, single-country studies that often report significant (and typically negative) leverage–outcome associations (e.g., Zeitun & Tian, 2007), and cross-country evidence emphasizing that capital-structure–outcome relationships are institutionally contingent and estimator-dependent rather than universal (Booth et al., 2001; Deesomsak et al., 2004; Fan et al., 2012). By pooling firms across eleven institutionally diverse N-11 economies, examining both a market-based (FV) and an accounting-based (ROE) outcome, and comparing cluster-robust fixed-effects inference against a static panel GMM de-meaning approach, this study shows that a genuine, positive, but modest within-firm leverage effect on both value and profitability is detectable once firm heterogeneity is properly purged and standard errors are computed via GMM, a relationship that pooled and cluster-robust fixed-effects estimates alone would have missed, while the hypothesized audit-quality moderation remains elusive across every specification and outcome examined.

6. Conclusion, Implications, and Limitations

This study examined whether audit quality moderates the relationship between capital structure and two firm outcomes, market-based firm value and accounting-based profitability (ROE), using a panel of 3,124 firms (31,240 firm-year observations) across the N-11 emerging economies over 2014–2024. Across pooled OLS, firm fixed-effects, cross-sectional GMM, and a static panel GMM estimator built on a within-firm de-meaning transformation, capital structure is unrelated to either outcome under pooled or cluster-robust fixed-effects estimation, but becomes positive and statistically significant for both firm value and ROE once the static panel GMM de-meaning approach is applied. Audit quality is positively, and in some specifications significantly, associated with ROE but not with firm value, and the hypothesized moderating role of audit quality (H2) is not supported for either outcome in any specification. Firm size is the most robust correlate of firm outcomes, remaining negative and significant across nearly every model.

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ISSN-p: 3006-2284, ISSN-e: 3006-0982
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For theory, these results show that a genuine, if modest, positive association between leverage and both firm value and profitability can exist within emerging-market firms even where naïve pooled or cluster-robust fixed-effects estimates suggest no relationship, underscoring the joint importance of the estimation transformation (within-firm de-meaning) and the standard-error procedure (GMM versus cluster-robust) used to test capital-structure theory. For practice and policy, the findings suggest that regulators in N-11 economies seeking to strengthen the link between external audit quality and firm outcomes may need to look beyond auditor identity, such as Big-4 affiliation, toward the broader quality of audit enforcement, disclosure regulation, and investor-protection institutions, particularly given that audit quality here relates more consistently to accounting profitability than to market-based value or to the pricing of leverage risk.

This study is subject to several limitations. First, capital structure, audit quality, and firm outcomes are measured with proxies that may not fully capture the underlying constructs; future research could use continuous audit-quality indices, such as audit fees, industry specialization, or auditor tenure, rather than a single Big-4 dummy variable. Second, the sensitivity of statistical inference to the choice between cluster-robust and GMM-based standard errors, documented in Section 5.3, warrants further investigation, including bootstrap-based standard errors and formal comparison against dynamic panel GMM specifications. Third, pooling firms across eleven institutionally diverse countries may mask cross-country heterogeneity; future research could re-estimate the models separately by country or region, or interact capital structure and audit quality with country-level institutional-quality indices. Finally, as with all observational panel studies, causal interpretation should remain cautious, and future work could exploit exogenous shocks to auditor choice or leverage, such as regulatory changes in audit requirements, to strengthen causal identification. Taken together, these findings offer N-11-wide evidence that the sign and significance of the capital-structure–firm-outcome relationship depend materially on how unobserved firm heterogeneity is controlled for, and that audit quality's disciplining role in this setting operates through accounting profitability rather than market valuation.

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Funding Statement

No monetary assistance was received by the authors from any grant provider, company, or charity/NGO to carry out the current work on this article.

Conflict of Interest Statement

There are no competing interests related to the work that could potentially influence or skew the findings of this study, as declared by the authors.

Ethical Approval

This study did not require ethical approval.

Author Contributions Statement

Mahwish Ayub: Conceptualization, methodology, data curation, formal analysis, and writing – original draft.

Imran Riaz Malik: Supervision, validation, and writing – review and editing.

Both authors read and approved the final manuscript.

Data Availability Statement

All data supporting this study's findings have been collected from publicly based resources. Financial and corporate governance indicators were sourced from annual statements issued by publicly traded entities and several nationally- and internationally acclaimed financial databases pertaining to those enterprises situated within the Next Eleven (N-11) economies during the years 2014 through 2024. Requests for any datasets produced or examined throughout the research process can be sent to the contact author. Use of

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Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
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Volume 5 Issue 7, 2026
ISSN-p: 3006-2284, ISSN-e: 3006-0982
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