University of Tehran Press

Interdisciplinary Journal of Management Studies (IJMS) Online ISSN: 2981-0795

Home Page: https://ijms.ut.ac.ir

The Impact of Free Cash Flow, Agency Costs, and Financial Leverage on the Financial Performance of Listed Firms in Vietnam: The Moderating Role of Firm Size and Age

Nguyen Hoang Phi Nam[1*] | Vo Thanh Thong[2] | Le Yen Nhi[3]

1. Corresponding Author, Department of Accounting and Auditing Faculty, Ho Chi Minh City Open University, Ho Chi Minh City, Vietnam. E-mail: nam.nhp@ou.edu.vn
2. Department of Banking and Finance Faculty, Ho Chi Minh City Open University, Ho Chi Minh City, Vietnam. E-mail: 2254032259thong@ou.edu.vn
3. Department of Banking and Finance Faculty, Ho Chi Minh City Open University, Ho Chi Minh City, Vietnam. E-mail: 2254032176nhi@ou.edu.vn

ARTICLE INFO

Article type:
Research Article

Article History:
Received: 02 September 2025
Revised: 30 December 2025
Accepted: 12 May 2026
Published Online: 01 November 2026

Keywords:
Free cash flow,
Agency costs,
Financial leverage,
Financial performance,
Vietnam.

ABSTRACT

This study investigates the interrelationships among free cash flow (FCF), agency costs (AC), financial leverage (DA), and financial performance (FP) in Vietnamese listed firms during 2019–2023, a period marked by heightened uncertainty due to the COVID-19 shock. Using firm-level panel data and Partial Least Squares Structural Equation Modeling (PLS-SEM), the study simultaneously examines direct effects, mediating mechanisms, and moderating roles. The results show that FCF has a positive and significant impact on FP and reduces both AC and DA. While AC does not exert a significant direct effect on FP and fails to mediate the FCF–FP relationship, DA has a consistently negative effect on performance and emerges as the dominant mediating channel through which FCF enhances FP. Although interaction terms involving firm size and firm age are statistically significant, their very small effect sizes indicate negligible moderating influence, suggesting broadly homogeneous leverage-related performance effects across firms. Overall, the findings extend Pecking Order Theory, partially support Trade-Off Theory, and challenge traditional agency-based predictions by demonstrating that financial leverage—rather than agency costs—constitutes the central mechanism linking free cash flow to firm performance in an emerging-market context.

Cite this article: Hoang Phi Nam, N.; Thanh Thong, V & Yen Nhi, L. (2027). The Impact of Free Cash Flow, Agency Costs, and Financial Leverage on the Financial Performance of Listed Firms in Vietnam: The Moderating Role of Firm Size and Age. *Interdisciplinary Journal of Management Studies* (*IJMS*), 20 (1), 301-326. http//doi.org/10.22059/ijms.2026.401093.677929

© Authors retain the copyright and full publishing rights.
DOI: http//doi.org/10.22059/ijms.2026.401093.677929

Publisher: University of Tehran Press.

1. Introduction

Financial performance (FP) remains a central construct in corporate finance and management studies, as it reflects a firm's ability to create value, sustain competitive advantage, and ensure long-term viability. In emerging markets, where institutional environments are often characterized by information asymmetry, weak monitoring structures, and constrained access to external capital, the effectiveness of internal financial decision-making becomes particularly critical. Within this context, free cash flow (FCF), agency costs (AC), and financial leverage (DA) constitute interrelated determinants that jointly shape corporate financial behavior and performance outcomes. Theoretical foundations drawn from agency theory, the free cash flow hypothesis, and capital structure frameworks consistently emphasize that these mechanisms interact in complex and potentially conflicting ways (Ahmed et al., 2023; Jensen, 1986; Jensen & Meckling, 1976; Kraus & Litzenberger, 1973; Myers & Majluf, 1984; Putri & Aris, 2023). However, the manner in which these relationships operate simultaneously within weak-governance environments remains insufficiently explored.

Free cash flow represents the internal liquidity available to firms after funding required investments and is generally expected to enhance FP by supporting profitable reinvestment opportunities or reducing reliance on costly external financing. From an agency perspective, however, excess FCF may increase managerial discretion, encourage overinvestment in negative net present value projects, and ultimately intensify agency conflicts between managers and shareholders (Jensen, 1986; Jensen & Meckling, 1976). Such conflicts manifest in higher agency costs that erode firm value and weaken performance. Financial leverage, in turn, may mitigate agency problems by imposing external discipline on managers, although excessive debt exposes firms to elevated financial risk and potential distress when leverage exceeds optimal levels (Kraus & Litzenberger, 1973; Myers, 1984). Accordingly, FP—commonly measured using accounting-based and market-based indicators such as ROA, ROE, EVA, and Tobin's Q—ultimately reflects the combined influence of liquidity management, governance frictions, and capital structure decisions (Ahmed et al., 2023; Putri & Aris, 2023).

Despite the conceptual clarity of these theoretical mechanisms, empirical evidence on the interrelationships among FCF, AC, DA, and FP remains highly inconsistent. While several studies report that high levels of FCF exacerbate agency costs and negatively affect FP (Khidmat & Rehman, 2014; Lachheb & Slim, 2017; Mahanavami, 2023; Sapuan et al., 2021; Wang, 2010), other studies find that effective FCF management enhances firm performance (Nobanee & Abraham, 2017; Pacheco, 2018; Umoru et al., 2022). Similarly, the impact of financial leverage on FP has been documented as positive, negative, or statistically insignificant, depending on institutional settings, industry conditions, and governance quality (Abu-Abbas et al., 2019; Chen, 2020; Iqbal & Usman, 2018; Mallinguh et al., 2020). These divergent findings suggest that firm-level heterogeneity—particularly in terms of firm size (SIZE) and firm age (AGE)—may play important moderating roles in shaping agency dynamics and capital structure effectiveness (Muzakki & Gandakusuma, 2023; Yahaya & Tijjani, 2021).

Vietnam provides a particularly relevant empirical setting to further examine these unresolved issues. As an emerging market experiencing rapid economic growth but characterized by relatively weak governance environments, Vietnam exhibits persistent challenges such as inconsistent disclosure enforcement, the absence of mandatory audit committees under the 2020 Enterprise Law, and limited internal and external monitoring mechanisms. These institutional deficiencies may amplify the adverse consequences of excess free cash flow and weaken the disciplinary role of leverage (Tran Minh Tuan, 2020; Hoang et al., 2019; Vo & Doan, 2014). However, existing studies on Vietnamese listed firms largely adopt a fragmented approach, examining the effects of FCF or DA on FP in isolation. Such studies rarely account for the simultaneous direct, indirect (mediating), and conditional (moderating) relationships that characterize contemporary corporate finance dynamics (Lê Hoàng & Thu, 2022; Tran Quang Chung, 2022). This narrow empirical focus limits the ability to reconcile conflicting findings and constrains a holistic understanding of financial behavior in weak-governance contexts.

In response to these gaps, the present study develops an integrated analytical framework to examine the combined effects of free cash flow, agency costs, and financial leverage on financial performance. Using a sample of 641 non-financial firms listed on the Ho Chi Minh Stock Exchange (HOSE) and Hanoi Stock Exchange (HNX) over the period 2019–2023, the study employs the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach implemented in SmartPLS 4.

Specifically, the study (1) examines the direct effects of FCF, AC, and DA on FP; (2) evaluates whether AC and DA mediate the relationship between FCF and FP; and (3) investigates whether firm size and firm age moderate the leverage–performance nexus. This multi-layered framework enables a more comprehensive theorization of how financial resources, governance frictions, and firm characteristics jointly shape corporate performance outcomes.

This study makes several contributions to the literature. First, by simultaneously modeling direct, mediating, and moderating effects, it advances beyond traditional linear and isolated examinations within agency theory, the free cash flow hypothesis, and the trade-off theory. Second, it provides new empirical evidence from an emerging market context where institutional imperfections intensify agency conflicts and financial risks, thereby offering insights relevant to developing and transitional economies. Third, the study offers practical implications for managers and policymakers seeking to optimize cash flow utilization, strengthen governance mechanisms, and design capital structure strategies aligned with firm characteristics and market constraints.

The remainder of this article is organized as follows. Section 2 presents the theoretical framework and hypothesis development. Section 3 outlines the data, variables, and methodological approach. Section 4 reports the empirical results, followed by a discussion in Section 5. Section 6 concludes with implications and directions for future research.

2. Literature Review

2-1. Theoretical Framework

This study integrates agency theory, the FCF hypothesis, and classical capital structure theories. According to agency theory, managerial-shareholder conflicts create AC that reduce FP (Jensen & Meckling, 1976). Jensen's (1986) FCF Hypothesis adds that excess FCF may encourage managers to pursue unprofitable projects for personal gain, thereby lowering firm value. From the trade-off theory perspective, firms balance tax benefits and bankruptcy costs (Kraus & Litzenberger, 1973), while Rajan and Zingales (1995) argue that leverage (DA) disciplines managers and enhances FP, though excessive debt increases distress risk. Under the Pecking-Order Theory, firms with ample internal funds rely less on external financing, which influences their leverage decisions (Myers & Majluf, 1984).

Size and age also moderate these effects. Larger and older firms typically have stronger credit access, lower financing costs, and better risk management (Holmes & Kent, 1991; Kieschnick & Moussawi, 2018). Accordingly, the framework posits that FCF, AC, and DA affect FP both directly and indirectly, while size and age moderate these relationships, forming the conceptual foundation for the study's hypotheses and empirical model.

2-2. Literature Review and Hypotheses Development

2-2-1. FCF and FP

FP reflects a firm's efficiency in utilizing economic resources to generate value and sustain long-term competitiveness. In corporate finance, FP is commonly measured through indicators such as ROA, ROE, or EVA, representing the outcomes of managerial decisions regarding investment, financing, and cash flow management. Because these outcomes depend greatly on how firms allocate and control their internal funds, FP is theoretically and empirically linked to the management of FCF.

FCF represents the residual cash available after a firm has undertaken all value-creating investment opportunities. According to agency theory and the FCF hypothesis (Jensen, 1986; Jensen & Meckling, 1976), abundant FCF can be either beneficial or detrimental to FP. On one hand, sufficient internal liquidity enables firms to finance profitable projects, enhance operational flexibility, and reduce financing costs—mechanisms that, in turn, strengthen FP. On the other hand, excess FCF may create opportunities for managerial opportunism, such as overinvestment or inefficient resource use, which ultimately suppresses FP. Thus, the theoretical relationship between FCF and FP is inherently ambiguous, depending on firm-specific governance and monitoring mechanisms.

Empirical studies have likewise produced mixed evidence. Several studies demonstrate that FCF improves FP by enabling firms to reduce financing constraints and invest in value-enhancing projects (Khidmat & Rehman, 2014; Lachheb & Slim, 2017; Mahanavami, 2023; Sapuan et al., 2021; Wang, 2010). These contradictions highlight the need to contextualize the FCF–FP relationship within countries that differ in governance quality, information transparency, and investor protection.

In emerging markets like Vietnam, these theoretical tensions are more pronounced. Weak monitoring mechanisms, limited transparency, and less developed corporate governance systems often constrain the efficient utilization of FCF. As a result, FCF may not always generate the intended improvements in firm value. Nonetheless, some Vietnamese evidence indicates that, when effectively managed, FCF can have a positive impact on FP (Le Thi et al., 2022). This suggests that despite structural weaknesses in governance, firms with stronger internal controls and investment discipline may still convert free cash resources into superior financial outcomes.

Synthesizing the theoretical arguments and empirical findings, this study positions FP as the dependent variable and FCF as a key financial determinant that shapes firm outcomes through investment efficiency and liquidity management. Given Vietnam's emerging-market characteristics, where financing constraints and capital market imperfections remain significant, FCF is expected to play an important functional role in improving FP. Accordingly, the following hypothesis is proposed:

H_1: FCF positively influences FP in non-financial firms listed in Vietnam.

2-2-2. FCF and Agency Cost

Agency cost (AC) originates from conflicts of interest between managers and shareholders, leading to inefficient resource allocation, higher monitoring expenditures, and a decline in firm value. Agency theory posits that such conflicts emerge when managerial discretion is weakly constrained, allowing managers to deviate from value-maximizing behavior (Jensen & Meckling, 1976). Within this framework, AC captures the extent to which governance mechanisms fail to discipline managerial actions, making it a crucial determinant of financial outcomes.

While Jensen's (1986) Free Cash Flow (FCF) hypothesis emphasizes that excess discretionary cash may intensify opportunistic behavior, an alternative strand of agency theory suggests that higher internal cash flows can reduce agency costs under certain conditions. Specifically, when firms generate sufficient FCF, they become less dependent on external financing, thereby reducing the need for intensive monitoring by creditors, lowering contracting costs, and alleviating conflicts associated with debt financing. In this sense, FCF may enhance financial flexibility and enable managers to operate more efficiently, resulting in lower observable AC.

Empirical evidence provides substantial support for this mitigating role of FCF. Several studies document negative or insignificant relationships between FCF and AC, particularly in firms with internal financing capacity or effective governance structures, where liquidity is used to stabilize operations rather than to extract private benefits (Muzakki & Gandakusuma, 2023; Nobanee & Abraham, 2017; Pacheco, 2018; Purnawarman & Handayati, 2021). These findings contrast with studies reporting a positive association (Khidmat & Rehman, 2014; Mahanavami, 2023; Sapuan et al., 2021; Umoru et al., 2022; Wang, 2010), suggesting that the FCF–AC relationship is highly context-dependent rather than universally positive.

In emerging markets such as Vietnam, this alternative mechanism may be particularly relevant. Although governance frameworks are imperfect, concentrated ownership structures and reliance on internal financing can partially substitute for formal monitoring mechanisms. Prior evidence indicates that Vietnamese firms often use internal cash flows to reduce operational frictions, improve liquidity management, and avoid costly external capital, which may indirectly suppress observable agency costs measured by accounting-based proxies (Lê Hoàng & Thu, 2022; Vo & Doan, 2014; Tran Minh Tuan, 2020; Tran Quang Chung, 2022).

Synthesizing agency theory, the mixed empirical evidence, and the institutional characteristics of Vietnam, this study argues that higher levels of FCF can attenuate agency costs by reducing financing frictions and monitoring intensity rather than exacerbating managerial opportunism. Accordingly, the following hypothesis is proposed:

H_2: Free cash flow (FCF) negatively affects agency costs (AC) in non-financial firms listed in Vietnam.

2-2-3. Agency Cost and FP

FP reflects the extent to which a firm efficiently utilizes its resources to generate economic value and ensure long-term sustainability. As a dependent variable, FP is sensitive to internal governance frictions, most notably AC, which arises from misaligned incentives between managers and shareholders. According to agency theory, higher AC manifests through inefficient investments, excessive administrative expenses, and opportunistic managerial behaviors that erode firm value rather than enhance shareholder wealth. These mechanisms directly impair operational efficiency and reduce FP.

The theoretical foundation suggests a negative relationship between AC and FP: As agency problems intensify, firms incur greater monitoring and bonding expenses, face suboptimal investment decisions, and experience weakened competitive positioning. AC thus functions as a central transmission mechanism through which governance quality influences firm outcomes. Poorly controlled agency conflicts distort capital allocation and impede firms' ability to translate resources into financial returns.

Empirical findings strongly support this negative association. Previous studies have documented that elevated AC reduces market value, weakens profitability, and deteriorates operational efficiency (Khidmat & Rehman, 2014; Mahanavami, 2023; Sapuan et al., 2021; Umoru et al., 2022; Wang, 2010). These studies align with the dependent variable in this research (FP) and employ independent variables directly linked to managerial discretion and governance quality, which makes them theoretically and empirically relevant to our analysis.

Conversely, a few studies report mixed or insignificant effects, indicating that firms with strong internal control systems or effective external oversight may partially mitigate the detrimental impact of AC on performance (Lachheb & Slim, 2017; Sapuan et al., 2021). These inconsistencies highlight the importance of contextual factors such as institutional environment, ownership structure, and monitoring mechanisms.

In emerging markets such as Vietnam, weak governance structures, concentrated ownership, and limited transparency can exacerbate agency problems. As noted in the Vietnamese context (Hoang et al., 2019; Tran Minh Tuan, 2020; Vo & Doan, 2014), firms often face constraints in supervising managerial decisions, which amplifies the negative influence of AC on FP. These structural characteristics reinforce the theoretical expectation that AC materially erodes financial outcomes in settings with insufficient monitoring.

Synthesizing theoretical foundations, empirical studies, and institutional characteristics, this study positions AC as a significant determinant of FP. Higher AC is expected to hinder firms' ability to generate financial value by reducing efficiency, increasing wasteful expenditures, and distorting investment decisions. Therefore, the following hypothesis is proposed:

H_3: AC negatively influences FP in non-financial firms listed in Vietnam.

2-2-4. FCF and DA

DA reflects a firm's reliance on debt financing and represents a crucial determinant of capital structure decisions. DA embodies both benefits and risks; while debt provides tax shields and enhances managerial discipline, it simultaneously increases financial distress when used excessively. Thus, understanding the determinants of leverage, particularly the role of internal liquidity such as FCF, is essential for explaining heterogeneous financing behaviors across firms.

From a theoretical standpoint, the relationship between FCF and DA is subject to competing predictions. According to the Pecking-Order Theory, firms prioritize internal funding; therefore, firms with abundant FCF tend to reduce dependence on external borrowing, implying a negative FCF–DA relationship (Myers & Majluf, 1984). By contrast, the trade-off theory and agency theory suggest that leverage can serve as a governance mechanism. Debt imposes mandatory interest payments that restrict managers' ability to engage in value-destroying activities, thereby reducing AC associated with excess cash holdings (Kraus & Litzenberger, 1973; Jensen & Meckling, 1976). Accordingly, these perspectives predict a positive association between FCF and leverage, as firms may intentionally employ debt to discipline managerial behavior.

Empirical evidence reflects these mixed theoretical views. Several studies report that higher FCF leads firms to increase leverage, consistent with agency and disciplinary debt arguments (Jaggi & Gul,

1999; Mahadwartha & Ismiyanti, 2008). In contrast, other studies document that firms with greater internal liquidity tend to rely less on debt, consistent with the pecking-order perspective (Al-Sraheen & Hamdan, 2022; Rezaei & Jafari, 2015; Chaklader & Padmapriya, 2021; Umoru et al., 2022). These conflicting findings highlight that the FCF–DA relationship is context-dependent and influenced by institutional quality, financial market development, and governance environments.

In emerging economies such as Vietnam, capital markets remain underdeveloped and information transparency is limited, thereby shaping firms' financing decisions. Even when possessing substantial FCF, many Vietnamese listed firms continue to rely heavily on debt due to limited access to equity financing, pressure to maintain growth, and weak monitoring mechanisms (Lê Hoàng & Thu, 2022; Vo & Doan, 2014; Tran Minh Tuan, 2020; Tran Quang Chung, 2022). These institutional constraints tend to weaken the disciplinary role of debt and amplify the motivation to utilize external financing regardless of internal liquidity conditions. Given this unique environment, the negative association between FCF and leverage is expected to prevail, consistent with the pecking-order prediction but embedded within Vietnam's structural financial constraints. Based on these theoretical arguments and empirical insights, the study proposes the following hypothesis:

H_4: FCF is negatively associated with DA in non-financial firms listed in Vietnam.

2-2-5. DA and FP

FP reflects a firm's efficiency in utilizing resources to generate returns, and capital structure, particularly DA, is a central determinant of this performance. As debt accumulation (DA) rises, firms gain access to additional financing that may enhance investment capacity and profitability, yet they also face heightened financial risk when indebtedness exceeds optimal levels. Understanding these dual effects is essential for explaining why the DA–FP relationship varies across firms and institutional settings.

Several theoretical frameworks illuminate the complexities of this relationship. According to the trade-off theory, companies look for the best level of leverage that balances the tax benefits of debt with the costs of bankruptcy and financial trouble (Kraus & Litzenberger, 1973). Moderate leverage can increase firm value through tax shields, but excessive leverage destroys value when financial risk escalates. The pecking-order theory provides another perspective, suggesting that firms with limited internal funds rely more on debt; high leverage therefore may signal financial constraints and is often associated with lower FP (Myers & Majluf, 1984). Meanwhile, agency theory highlights the disciplinary role of debt: Regular interest payments restrict managerial opportunism and align managers with shareholders, yet they also highlight that high debt magnifies agency conflicts between shareholders and creditors (Jensen & Meckling, 1976). These competing mechanisms imply that DA can either enhance or impair FP depending on firm context and market conditions.

Empirical evidence mirrors these theoretical ambiguities. Some studies document that leverage improves FP, consistent with the disciplinary and tax-shield mechanisms (Abu-Abbas et al., 2019; Arhinful & Radmehr, 2023; Dodoo et al., 2023; Omodara et al., 2024; Mutumanikam & Adelin, 2024). Conversely, other research finds negative or insignificant effects, suggesting that financial distress and borrowing constraints outweigh potential benefits (Chen, 2020; Ilyukhin, 2015; Iqbal & Usman, 2018; Rezaei & Jafari, 2015; Sifullah et al., 2024). These mixed findings underscore that leverage outcomes vary substantially across institutional environments, levels of financial development, and governance structures.

In Vietnam's emerging market context, limited transparency, uneven credit access, and the prevalence of bank-based financing intensify the impact of leverage on firm outcomes. Prior evidence shows that DA plays a substantial role in shaping FP, yet its direction remains inconsistent across studies (Hoang et al., 2019; Ngo et al., 2020; Dinh & Pham, 2020; Tran Minh Tuan, 2020; Vo & Doan, 2014). These inconsistencies, combined with persistent governance weaknesses, call for further empirical examination of how leverage influences performance among Vietnamese listed firms. Given the theoretical foundations and mixed empirical results, this study hypothesizes the following:

H_5: DA significantly affects FP in non-financial firms listed in Vietnam.

2-2-6. The Mediating Role of AC in the Indirect Effect of FCF on FP

FP represents the ultimate outcome of a firm's resource utilization and strategic decisions, reflecting its efficiency, profitability, and long-term value creation. According to agency theory, FP deteriorates when managers pursue self-interested actions that deviate from shareholder objectives, thereby increasing AC and impairing operational efficiency (Jensen & Meckling, 1976). Extensive empirical findings support this negative association, showing that higher AC, often manifested through inefficiencies, monitoring expenses, or managerial opportunism, reduces firms' financial outcomes (Houqe et al., 2022; Elema et al., 2024; Nuhu et al., 2020; Rohim et al., 2024; Wambua, 2013). Evidence from Vietnam similarly indicates that weak transparency, insufficient internal controls, and limited governance standards amplify AC and reduce FP (Hoang et al., 2019; Lê Hoàng & Thu, 2022; Tran Minh Tuan, 2020; Tran Quang Chung, 2022; Hoang et al., 2019; Vo & Doan, 2014).

Within this context, AC is expected to serve as a central explanatory mechanism linking FCF to FP. According to the FCF Hypothesis (Jensen, 1986), excess FCF provides managers with discretionary resources that may be diverted to unprofitable investments or private benefits. Such behaviors intensify agency problems, thereby increasing AC and ultimately reducing FP. Theoretical arguments from both agency theory and FCF Theory, therefore, conceptualize AC as a core mechanism through which FCF influences firm outcomes (Jensen, 1986; Jensen & Meckling, 1976). Empirical studies reinforce this logic, showing that excess FCF typically elevates AC (Khidmat & Rehman, 2014; Mahanavami, 2023; Sapuan et al., 2021; Umoru et al., 2022; Wang, 2010), and that high AC is subsequently associated with lower FP across various contexts (Rohim et al., 2024; Stoiljković et al., 2024; Wambua, 2013).

However, the strength and direction of this mediating process remain empirically debated. While numerous studies in emerging and developing markets find robust evidence that AC mediates the FCF–FP relationship (Pacheco, 2018), other studies document insignificant or context-dependent results, suggesting that governance environments and measurement differences may affect the mediation mechanism (Mahanavami, 2023; Muzakki & Gandakusuma, 2023; Purnawarman & Handayati, 2021; Sapuan et al., 2021; Umoru et al., 2022). These inconsistencies indicate the importance of considering institutional factors. In Vietnam, where transparency is limited and monitoring mechanisms are relatively weak, excess FCF is especially likely to heighten AC and consequently weaken FP (Lê Hoàng & Thu, 2022; Tran Minh Tuan, 2020; Tran Quang Chung, 2022; Vo & Doan, 2014). Therefore, the mediating role of AC is theoretically well-founded and empirically plausible within this institutional setting.

Bringing these arguments together, the relationship between FCF and FP can be conceptualized as an indirect pathway, in which excess FCF intensifies agency problems, thereby raising AC and reducing FP. This mechanism aligns with both classical agency models and contemporary empirical findings, suggesting that AC functions as a transmission channel through which managerial discretion associated with FCF translates into lower FP. Accordingly, the following hypothesis is proposed:

H_6: AC mediates the relationship between FCF and FP in non-financial firms listed in Vietnam.

2-2-7. The Mediating Role of DA in the Indirect Effect of FCF on FP

FP represents the ultimate outcome of firms' strategic, investment, and financing decisions and is typically reflected through profitability, market valuation, and efficiency indicators. Theories of corporate finance consistently emphasize that FP is shaped not only by internal cash-generation capability but also by the firm's capital structure, which conditions the extent to which financial resources are transformed into value creation. Within this framework, DA emerges as a crucial mechanism through which FCF may exert an indirect influence on FP.

According to the pecking-order theory, firms with abundant internal funds prefer to finance investments using FCF rather than external borrowing, implying that higher FCF tends to reduce debt levels (Myers & Majluf, 1984). In contrast, the trade-off theory argues that debt provides tax benefits and supports optimal capital structure, while the agency theory suggests that leverage disciplines managers by limiting the amount of discretionary resources under their control (Kraus & Litzenberger, 1973; Jensen & Meckling, 1976). These theoretical foundations imply a dual mechanism. First, FCF affects leverage decisions: firms with excess liquidity may either reduce debt (consistent with the

pecking-order view) or strategically use debt to curb managerial opportunism (consistent with the agency perspective). Second, leverage itself directly affects FP, either positively through tax shields and governance discipline or negatively through increased distress cost and reduced financial flexibility.

Empirical evidence further reinforces this conceptual pathway. Several studies show that FCF significantly influences leverage structures, and in turn, leverage mediates the relationship between internal financing capacity and FP (Nam & Tuyen, 2024; Park & Jang, 2013; Ramli et al., 2019). These findings suggest that the way firms adjust their debt levels in response to FCF availability can either amplify or weaken the impact of cash resources on performance. Conversely, some studies report that the mediating effect of leverage is weak or highly dependent on institutional environments, property rights, and financial market development (Nam & Tuyen, 2024; Ramli et al., 2019). Such mixed evidence highlights that the mediating role of leverage is not universal but context-dependent.

Vietnam's emerging capital market provides an important setting for this analysis. Limited transparency, uneven access to external financing, and an underdeveloped corporate governance framework make capital structure decisions more sensitive to internal cash availability (Ngo et al., 2020; Dinh & Pham, 2020; Tran Quang Chung, 2022; Vo & Doan, 2014). In this institutional context, FCF becomes a dominant determinant of debt usage. Firms with high free cash flow (FCF) often reduce leverage because internal funds substitute for borrowing; at the same time, however, lenders exercise greater caution in environments with low disclosure quality, making leverage adjustments a salient channel through which financial flexibility, liquidity management, and investment discipline affect firm performance (FP).

Taken together, both theoretical reasoning and empirical evidence converge on the expectation that leverage serves as an important mediating mechanism in the FCF–FP nexus. FCF shapes capital structure decisions, and leverage, in turn, influences financial outcomes by altering financial risk, tax effects, and managerial discipline. Hence, the model proposes that DA operates as a transmission channel through which FCF indirectly influences FP in Vietnamese listed firms.

H_7: DA mediates the relationship between FCF and FP in non-financial firms listed in Vietnam.

2-2-8. The Moderating Role of Firm Age in the Relationship between DA and FP

FP reflects a firm's ability to generate value through efficient resource utilization, strategic financing choices, and long-term operational stability. According to foundational corporate finance theories, capital structure decisions—particularly DA—play a central role in shaping FP. The trade-off theory posits that debt enhances firm value through tax shields but simultaneously elevates financial distress costs (Kraus & Litzenberger, 1973). The pecking-order theory suggests that firms with financial constraints rely more heavily on external borrowing due to limited internal funds (Myers & Majluf, 1984), while the agency theory highlights the disciplining effect of debt, which reduces managerial opportunism but may also restrict operational flexibility (Jensen & Meckling, 1976). These theories jointly imply that the impact of DA on FP is not uniform across firms but can vary systematically with firm-specific characteristics.

Firm age (AGE) represents one such characteristic that conditions how leverage influences performance. Older firms typically accumulate stronger reputational capital, more robust governance structures, established banking relationships, and better-developed monitoring mechanisms. These advantages enable mature firms to manage the risks associated with leverage more effectively than younger firms, which generally face higher information asymmetry, weaker credit histories, and limited access to financing (Mallinguh et al., 2020; Muzakki & Gandakusuma, 2023; Yahaya & Tijjani, 2021). As a result, the same level of debt may enhance FP in older firms by supporting investment capacity and signaling credibility, while imposing greater distress risk and performance volatility on younger firms.

Empirical findings reinforce this theoretical argument. Prior studies document that AGE systematically alters the association between DA and FP across different institutional and market environments (Arhinful & Radmehr, 2023; Matemilola et al., 2017). These studies collectively suggest that older firms' accumulated experience and financial resilience moderate the sensitivity of FP to

leverage. In contrast, younger firms often demonstrate weaker performance under high leverage due to adverse financing conditions, governance limitations, and greater vulnerability to external shocks.

In Vietnam's emerging market context, this moderating effect is particularly relevant. Younger firms often encounter severe credit constraints, higher borrowing costs, and lower transparency, while mature firms benefit from more favorable lending relationships, greater investor trust, and stronger internal control systems (Lê Hoàng & Thu, 2022; Tran Minh Tuan, 2020; Tran Quang Chung, 2022; Vo & Doan, 2014). These structural differences imply that AGE significantly conditions the DA–FP relationship, with older firms more capable of absorbing leverage-related risks and utilizing debt strategically.

Synthesizing theoretical reasoning and empirical evidence, firm age is expected to moderate the effect of DA on performance by strengthening firms' ability to manage financial risk and exploit the benefits of debt. Accordingly, the following hypothesis is proposed:

> **H_8:** AGE moderates the DA–FP relationship, such that the negative effect of DA weakens in older firms.

2-2-9. The Moderating Role of Firm Size in the Relationship between DA and FP

FP represents a firm's ability to generate value efficiently through strategic financing, investment, and operational decisions. Among these determinants, DA plays a central role because it influences both the cost of capital and the firm's risk profile. The trade-off theory argues that leverage enhances FP through tax shields but simultaneously increases the probability of financial distress when debt levels are excessive (Kraus & Litzenberger, 1973). Similarly, the pecking-order theory emphasizes that firms facing internal financing constraints rely more heavily on debt, which may heighten risk exposure and reduce performance (Myers & Majluf, 1984). From the perspective of agency theory, leverage can discipline managers by limiting discretionary resources but may also exacerbate conflicts between shareholders and creditors, ultimately affecting FP. These theoretical foundations suggest that the impact of DA on FP is neither linear nor uniform across firms.

Firm size (SIZE) is a key structural characteristic that conditions how leverage affects performance. Larger firms typically possess stronger credit reputations, more diversified operations, and more sophisticated governance mechanisms, allowing them to absorb financial risk more effectively than smaller firms. Consequently, large firms are better equipped to manage the costs of debt and exploit its disciplinary and tax-related advantages. In contrast, smaller firms—facing higher information asymmetry, weaker bargaining power with lenders, and limited ability to diversify risk—are more exposed to the detrimental effects of excessive leverage (Bolarinwa et al., 2026; Ibhagui & Olokoyo, 2018). These theoretical channels imply that SIZE fundamentally moderates the DA–FP relationship by shaping firms' resilience to leverage-related risks.

Empirical evidence supports this moderating mechanism. Numerous studies demonstrate that SIZE significantly influences how leverage affects performance, with larger firms displaying a more stable or even positive leverage–performance association, while smaller firms exhibit higher sensitivity to debt-induced distress (Bolarinwa et al., 2026; Ibhagui & Olokoyo, 2018). In the context of Vietnam's emerging capital market, the moderating role of SIZE becomes even more pronounced due to limited transparency, uneven access to financing, and substantial disparities in credit allocation between small and large firms. Empirical findings consistently show that SIZE shapes the DA–FP relationship among Vietnamese listed companies, with larger firms enjoying better credit access, enhanced monitoring systems, and greater protection against financial shocks (Hoang et al., 2019; Lê Hoàng & Thu, 2022; Tran Quang Chung, 2022; Vo & Doan, 2014).

Integrating theoretical arguments and empirical evidence, firm size is expected to play a moderating role by influencing how DA translates into performance outcomes. Large firms, due to superior financial capacity and governance infrastructure, can mitigate the negative effects of leverage, whereas smaller firms remain more vulnerable to its risks. Based on this reasoning, the following hypothesis is proposed:

> **H_9:** SIZE moderates the DA–FP relationship, such that the negative effect of DA is more pronounced in smaller firms.

3. Methods

3-1. Data Collection, Selection Matrix and Time Limit

The study initially identified 646 non-financial firms listed on the Ho Chi Minh Stock Exchange (HOSE) and the Hanoi Stock Exchange (HNX) over the period 2019–2023. Financial institutions were excluded due to their distinct asset structures, regulatory requirements, and inherently high leverage ratios, which render their financial behavior fundamentally different from that of non-financial firms. After eliminating five firms with incomplete or inconsistent financial data, the final sample comprised 641 firms, yielding a balanced and reliable panel for empirical analysis.

Firm-level data were collected from audited annual financial statements and cross-validated using established financial databases to ensure accuracy and consistency. The selected time frame captures recent economic fluctuations and regulatory developments in Vietnam, thereby providing a relevant context for examining the dynamics among free cash flow, agency costs, financial leverage, and firm performance.

To test the proposed research model, this study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4. This methodological choice is well suited to the objectives of the study for several reasons. First, the model incorporates simultaneous direct, mediating, and moderating relationships involving AC, DA, AGE, and SIZE, requiring an estimation technique capable of handling complex causal structures, which PLS-SEM effectively accommodates (Hair et al., 2019). Second, PLS-SEM is particularly appropriate for financial data that often exhibit non-normal distributions, measurement error, and potential multicollinearity among indicators (Hair et al., 2021). Third, prior corporate finance studies have successfully applied PLS-SEM to examine indirect effects and interaction mechanisms using multi-indicator constructs comparable to those in this study (e.g., Nam & Tuyen, 2024; Ramli et al., 2019).

Moreover, in emerging-market settings such as Vietnam—where firm characteristics are highly heterogeneous and financial disclosures may be noisy—PLS-SEM offers enhanced predictive accuracy, estimation flexibility, and robustness relative to covariance-based SEM approaches (Vo & Doan, 2014; Tran Quang Chung, 2022). Accordingly, PLS-SEM provides a methodologically sound and empirically appropriate framework for analyzing the complex financial relationships central to this study.

3-2. Variables Measurement

The research framework and empirical strategy employed to examine the effects of free cash flow (FCF) on agency costs (AC), financial leverage (DA), and financial performance (FP) are illustrated in Figure 1.

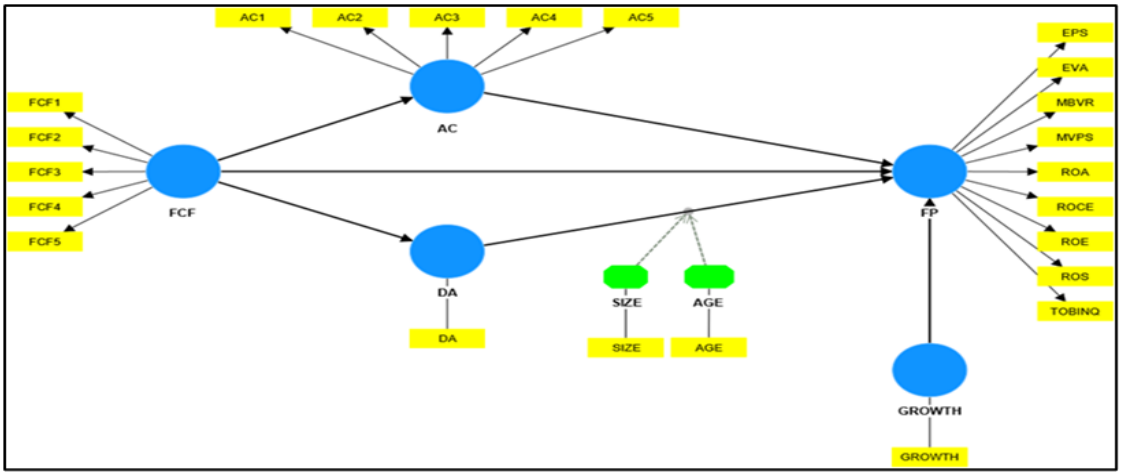


Fig. 1. Research Model
Source: SmartPLS 4

The model integrates direct, mediating, and moderating relationships to capture the complex financial mechanisms through which internal liquidity and capital structure decisions influence firm performance. To operationalize the research model, all constructs are carefully defined and measured

in a manner consistent with prior empirical literature and the requirements of PLS-SEM. Table 1 summarizes the variables included in the final model, detailing their symbols and calculation methods, and supporting references. This structured presentation ensures conceptual clarity, measurement transparency, and empirical replicability.

Table 1. Measurement of Variables in the Model

Proxy	Symbol	Methods of Calculation	Previous Studies
Dependent Variable			
Financial Performance (FP)	EPS	(Profit after Taxes - Preferred Stock Dividends) / Number of Outstanding Shares	Dahiyat et al. (2021); Bodiyabaduge & Rajakaruna Mudalige (2024)
	EVA	Net Operating Profit after Tax - Invested Capital × Weighted Average Cost of Capital	Silvia & Wangka (2022); Nurjanah & Prasetyo (2024);
	MBVR	Market Capitalization / Book Value of the Equity	Geertsema & Lu (2023); Khan et al. (2024)
	MVPS	Total Market Value of the Firms / Total number of Shares Outstanding	Ghanbari et al. (2015); Abughniem et al. (2020)
	ROA	Profit after Taxes / Total Assets	Lachheb & Slim (2017); Sapuan et al. (2021); Farouk et al. (2024)
	ROCE	Earnings before Interest and Taxes / (Total Assets - Short-Term Debt)	Nam & Tuyen (2024)
	ROE	Profit after Taxes / Equity Capital	Sapuan et al. (2021); Yilmaz & Samour (2024)
	ROS	Profit after Taxes / Revenue	Duru et al. (2016); Batchimeg (2017)
	Tobin'Q	(Market Value of Equity + Book Value of Short-Term Liabilities) / Total Assets	Muzakki & Gandakusuma (2023); Listiadi (2023)
Independent Variable			
Free Cash Flow (FCF)	FCF1	(Earnings before Interest and Taxes x (1- Taxes) - Net Investment in Operating Capital) / Total Assets	Yeo (2018); Khair et al. (2023)
	FCF2	(Operating Cash Flows - Taxes - Interest Expense - Dividends) / Sales	Lang et al. (1991); Wang (2010); Khidmat & Rehman (2014)
	FCF3	(Earnings before Interest and Taxes + Depreciation - Taxes - Interest Expense - Dividends) / Total Assets	Henry (2010); Guizani (2017); Abdel-Aziz & Alrabba (2023)
	FCF4	(Operating Cash Flows - Capital Expenditure - Net Working Capital) / Total Assets	Widiastari & Yasa (2018); Putri & Aris (2023)
	FCF5	(Profit after Taxes + Depreciation – Working Capital Change - Capital Expenditure) / Sales	Richardson (2006; conceptual basis, adapted by authors)
Mediating Variable			
Agency Costs (AC)	AC1	Sales / Total assets	Kontuš (2021); Ahmed et al. (2023)
	AC2	Interest Expenses / Sales	Gul & Tsui (2001); Nuhu et al. (2020)
	AC3	Operating Expense / Sales	Chong et al. (2017); Linda et al. (2024)
	AC4	Administrative Expense / Sales	Wang (2010); Zhu et al. (2022);
	AC5	Other Expense / Sales	Wang (2010); Pacheco (2018)
Financial Leverage (DA)	DA	Total Debt / Total Assets	Lachheb & Slim (2017); Chong et al. (2017); Arhinful & Radmehr (2023)
Moderating Variable			
Firm Size	SIZE	Logarit of Total Assets	Khan (2012); Hoang et al. (2019); Abughniem et al. (2020)
Firm Age	AGE	Logarit of the Number of Years Listed on the Stock Market of the Firm	Shumway (2001)
Controlled Variable			
Growth opportunity	GROWTH	(Sales This Year – Sales Last Year) / (Sales Last Year)*100%	Mensah et al. (2025)

Financial performance (FP) is specified as a latent construct reflecting both accounting-based and market-based dimensions of firm outcomes. Following established studies, FP is initially measured using a broad set of indicators, including profitability ratios (e.g., ROA, ROE, ROCE, ROS), value-based measures (EVA), and market valuation metrics (EPS, MVPS, MBVR, and Tobin's Q). Consistent with best practices in PLS-SEM, indicators that do not meet reliability, validity, or collinearity criteria are subsequently refined during the measurement model assessment.

Free cash flow (FCF) serves as the primary independent variable and is captured through multiple proxies reflecting alternative conceptualizations of internally generated liquidity. These measures account for operating cash flows, investment expenditures, working capital adjustments, and financing commitments, thereby providing a comprehensive representation of firms' discretionary cash availability.

Agency costs (AC) are modeled as a mediating construct and proxied using accounting-based efficiency ratios commonly employed in prior research. These indicators reflect managerial resource utilization and expense intensity, which are observable manifestations of agency-related frictions in environments with limited governance enforcement.

Financial leverage (DA) is measured as the ratio of total debt to total assets and is incorporated both as an explanatory variable and as a mediating mechanism linking FCF and FP. This specification is consistent with capital structure theories emphasizing the dual disciplinary and risk-enhancing roles of debt.

To capture firm heterogeneity, firm size (SIZE) and firm age (AGE) are included as moderating variables in the leverage–performance relationship. Interaction terms (AGE × DA, SIZE × DA, and AC × FCF) are explicitly constructed using the product indicator approach within the PLS-SEM framework. Growth opportunity (GROWTH) is included as a control variable to account for differences in firms' expansion potential.

4. Results

4-1. Descriptive Statistics

Table 2 reports the descriptive statistics of the main variables used in the study, providing initial insights into their distributional properties and variability. The free cash flow indicators generally exhibit standard deviations close to their mean values, suggesting relatively stable cash flow patterns across most firms. An exception is FCF5, which displays substantially higher dispersion, indicating greater heterogeneity in cash flow management practices among the sampled firms.

Table 2. Descriptive Statistics

Name	**Mean**	**Observed Min**	**Observed Max**	**Standard Deviation**
STT	1603	1	3205	925.204
MCK		0	0	
NAM	2021	2019	2023	1.414
FCF1	0.042	-2.209	5.195	0.226
FCF2	0.021	-1.438	1.313	0.144
FCF3	-0.074	-2.712	0.641	0.176
FCF4	0.123	0	0.859	0.144
FCF5	-1.919	-1260.52	115.359	31.917
ROA	0.054	-0.483	0.654	0.074
ROE	0.081	-25.331	1.587	0.539
ROS	0.185	-41.753	338.004	6.101
EVA	0.068	-2.156	0.827	0.084
EPS	1133.164	-34904	43423.49	2838.805
TOBINQ	1.163	0.047	9.572	0.653
MVPS	24664.89	0	288200	26183.61
MBVR	1.333	-3.272	97.791	2.122
ROCE	0.13	-8.214	1.286	0.209
AC1	1.156	-0.126	13.915	1.382
AC2	0.192	-2.142	48.131	1.353
AC3	0.368	0.001	1.247	0.211
AC4	0.007	-11.437	2.275	0.22
AC5	0.099	-9.793	52.667	1.225
SIZE	12.037	10.128	14.825	0.724
GROWTH	0.296	-1	126.266	3.721
DA	0.459	0.001	1.295	0.224
AGE	0.852	0	1.362	0.378

Source: SmartPLS 4

Financial performance measures, such as ROA, ROE, and EVA, show relatively low variability, implying consistent profitability levels across firms during the study period. In contrast, ROS and MBVR exhibit higher dispersion, reflecting differences in operational efficiency and market valuation. Notably, EPS and MVPS present pronounced standard deviations, suggesting substantial fluctuations in earnings and market prices, which is common in emerging markets characterized by volatile investor sentiment.

Agency cost proxies, along with firm size, financial leverage, and firm age, display moderate variation, indicating comparable governance and structural characteristics among firms. Firm growth, however, shows relatively higher dispersion, highlighting heterogeneous expansion trajectories across firms. Overall, these descriptive results suggest meaningful cross-sectional variation, supporting the suitability of the sample for subsequent multivariate and structural analyses.

4-2. Assessment of Indicator Reliability

The reliability of Individual Indicators is presented in Table 3.

Table 3. Outer Loadings Matrix

	AC	AGE	DA	FCF	FP	GROWTH	SIZE	SIZE x DA	AGE x DA
AC1	-0.306								
AC2	-0.051								
AC3	0.796								
AC4	0.322								
AC5	0.308								
AGE		1							
DA			1						
EPS					0.534				
EVA					0.832				
FCF1				0.493					
FCF2				0.69					
FCF3				-0.768					
FCF4				0.607					
FCF5				0.101					
GROWTH						1			
MBVR					0.281				
MVPS					0.714				
ROA					0.895				
ROCE					0.625				
ROE					0.287				
ROS					0.097				
SIZE							1		
TOBINQ					0.679				
SIZE x DA								1	
AGE x DA									1

Source: SmartPLS 4

Table 3 presents the outer loadings of the measurement model, which assess the indicator reliability of the latent constructs. Following the guideline proposed by Hair et al. (2019), indicators with outer loadings below 0.40 do not meet the minimum threshold for construct validity and should be removed to improve measurement quality. Based on these criteria, several indicators under free cash flow (FCF3 and FCF5), agency costs (AC1, AC2, AC4, and AC5), and financial performance (MBVR, ROE, and ROS) exhibit insufficient loadings and were consequently excluded from the model.

The removal of these indicators enhances the reliability and convergent validity of the remaining constructs, thereby ensuring that the measurement model adequately captures the underlying theoretical concepts. This refinement process strengthens the robustness of subsequent structural model estimations and provides a sound basis for hypothesis testing in the following analyses. The reliability of the set of indicators is presented in Table 4.

Table 4 reports the convergent validity of the measurement model as assessed by the Average Variance Extracted (AVE). According to Hair et al. (2019), an AVE value of 0.50 or higher indicates that a construct explains more than half of the variance of its indicators. The initial results show that

the AVE values for AC, FCF, and FP fall below this recommended threshold, suggesting insufficient convergent validity.

Table 4. Construct Reliability and Validity: An Overview

	Cronbach's alpha	*Composite Reliability (rho_a)*	*Composite Reliability (rho_c)*	*Average Variance Extracted (AVE)*
AC	0.042	-0.312	0.219	0.186
FCF	-0.328	0.538	0.276	0.338
FP	0.731	0.882	0.811	0.368

Source: SmartPLS 4

To address this issue, the indicator FCF1—exhibiting the lowest outer loading within the acceptable range of 0.40 to 0.70—was removed in accordance with Hair et al. (2019). This step aims to enhance the convergent validity of the constructs while preserving their theoretical meaning. Following the removal of the low-performing indicators, the refined measurement model demonstrates improved AVE values and is presented in Figure 2. This refined model provides a more reliable and valid foundation for subsequent structural model analysis.

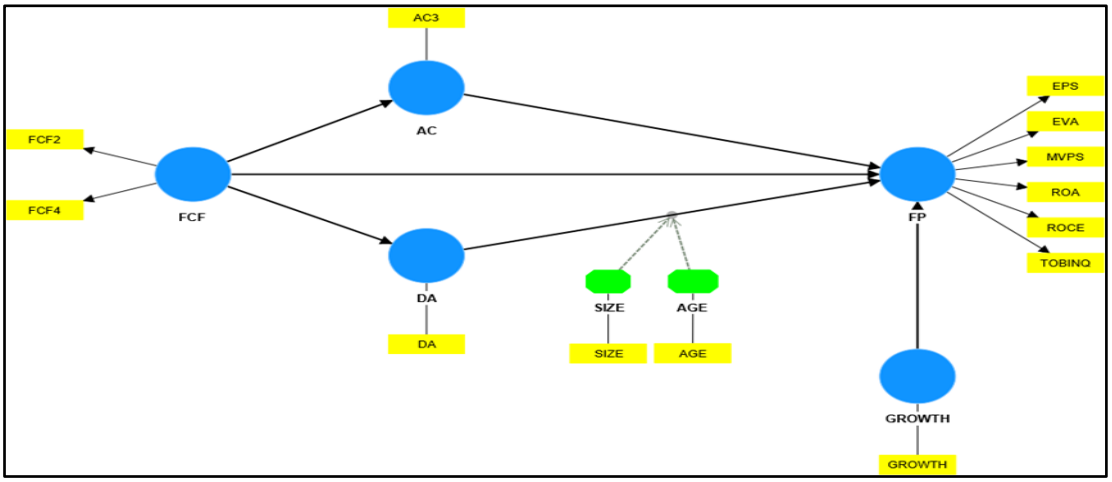


Fig. 2. Research Model 2
Source: SmartPLS 4

Table 5. Construct Reliability and Validity: An Overview

	Cronbach's alpha	**Composite Reliability (rho_a)**	**Composite Reliability (rho_c)**	**Average Variance Extracted (AVE)**
FCF	0.244	0.261	0.719	0.566
FP	0.818	0.871	0.867	0.527

Source: SmartPLS 4

Table 5 summarizes the construct reliability and convergent validity of the refined measurement model. The results show that the Average Variance Extracted (AVE) values for both FCF and FP exceed the recommended threshold of 0.50, thereby confirming satisfactory convergent validity (Hair et al., 2019). In addition, the composite reliability measures (ρa and ρc) for both constructs are above the minimum acceptable level of 0.70, indicating adequate internal consistency reliability.

Although the Cronbach's alpha value for the FCF construct is relatively low, composite reliability is considered a more appropriate reliability criterion in PLS-SEM, particularly for models with a limited number of indicators. Taken together, these results suggest that the indicators reliably represent their respective latent constructs, and that the measurement model meets the required reliability and validity standards. Consequently, the refined measurement model provides a sound basis for subsequent structural model estimation. The average values of interconstruct correlations of indicators across constructs using the heterotrait–monotrait ratio (HTMT) are presented in Table 6.

Table 6. Discriminant Validity: HTMT Matrix

	AC	AGE	DA	FCF	FP	GROWTH	SIZE	AGE x DA	SIZEx DA
AC									
AGE	0.027								
DA	0.811	0.051							
FCF	0.526	0.085	0.661						
FP	0.194	0.051	0.21	0.828					
GROWTH	0.003	0.005	0.006	0.062	0.023				
SIZE	0.114	0.099	0.361	0.269	0.151	0.005			
AGE x DA	0.03	0.083	0.032	0.017	0.057	0.001	0.063		
SIZE x DA	0.164	0.066	0.057	0.106	0.047	0.005	0.002	0.167	

Source: SmartPLS 4

Following the criterion proposed by Henseler et al. (2015), HTMT values below 0.85 indicate adequate discriminant validity, whereas values equal to or exceeding 0.90 suggest potential construct overlap. The results show that all HTMT values among the examined construct pairs fall well below the conservative threshold of 0.85.

These findings confirm that each latent construct, including free cash flow, agency costs, financial performance, and the moderating interaction terms, captures a conceptually distinct phenomenon. In particular, the discriminant validity between free cash flow and financial performance is well established, supporting the empirical separability of these constructs. Overall, the satisfactory HTMT results indicate that the measurement model meets the discriminant validity requirement, thereby justifying the use of bootstrapping procedures for subsequent structural model estimation and hypothesis testing. The results for HTMT Bootstrap Test is presented in Table 7.

Table 7. Boostrapping: HTMT

	Original Sample (O)	Sample Mean (M)	2.50%	97.50%
AGE <-> AC	0.027	0.028	0.002	0.061
DA <-> AC	0.811	0.811	0.794	0.828
DA <-> AGE	0.051	0.051	0.016	0.086
FCF <-> AC	0.526	0.529	0.445	0.624
FCF <-> AGE	0.085	0.101	0.05	0.16
FCF <-> DA	0.661	0.665	0.571	0.773
FP <-> AC	0.194	0.197	0.17	0.225
FP <-> AGE	0.051	0.055	0.028	0.088
FP <-> DA	0.21	0.212	0.178	0.257
FP <-> FCF	0.828	0.83	0.725	0.953
GROWTH <-> AC	0.003	0.02	0.001	0.053
GROWTH <-> AGE	0.005	0.011	0	0.033
GROWTH <-> DA	0.006	0.019	0.001	0.05
GROWTH <-> FCF	0.062	0.093	0.028	0.186
GROWTH <-> FP	0.023	0.027	0.014	0.047
SIZE <-> AC	0.114	0.114	0.083	0.145
SIZE <-> AGE	0.099	0.099	0.063	0.133
SIZE <-> DA	0.361	0.361	0.332	0.39
SIZE <-> FCF	0.269	0.27	0.195	0.354
SIZE <-> FP	0.151	0.15	0.128	0.174
SIZE <-> GROWTH	0.005	0.01	0	0.034

Source: SmartPLS 4

Table 7 reports the results of the bootstrapped heterotrait–monotrait ratio (HTMT) test used to further assess discriminant validity. Following Henseler et al. (2015), discriminant validity is confirmed when the null hypothesis that HTMTij_{ij}ij ≥ 1 is rejected based on the 95% bootstrap confidence interval. The results show that, for all construct pairs, the HTMT values in the original sample fall within the corresponding 95% confidence intervals (2.5%–97.5%), and none of the upper bounds exceeds the critical value of 1.

These findings provide strong statistical evidence in support of the alternative hypothesis HTMTij_{ij}ij < 1, thereby confirming discriminant validity across all latent constructs, including the interaction terms. Consequently, the measurement model satisfies the discriminant validity requirement and is suitable for subsequent structural model estimation and hypothesis testing.

4-3. Structural Model Validation

4-3-1. Assessment of Multicollinearity

Table 8 reports the inner variance inflation factor (VIF) values used to assess potential multicollinearity among the indicators in the structural model

Table 8. Collinearity Statistics: Inner VIF Values

	VIF
AC3	1
AGE	1
DA	1
EPS	1.613
EVA	2.819
FCF2	1.02
FCF4	1.02
GROWTH	1
MVPS	2.66
ROA	3.801
ROCE	1.571
SIZE	1
TOBINQ	2.528
AGE x DA	1
SIZE x DA	1

Source: SmartPLS 4

According to Hair et al. (2019), VIF values below 3.3 indicate the absence of critical collinearity issues in PLS-SEM. The results show that most indicators exhibit VIF values well within the acceptable range, suggesting limited shared variance among the predictors.

However, the indicator ROA displays a VIF value of 3.801, exceeding the recommended threshold, indicating a potential multicollinearity concern that could bias parameter estimates and reduce model stability. To address this issue, ROA was removed from the model in line with Hair et al.'s (2019) methodological guidance. This adjustment reduces collinearity and enhances the robustness and reliability of the FP construct, thereby ensuring a more stable foundation for subsequent structural path estimation. Table 9 reports the construct reliability and convergent validity of the measurement model after the removal of ROA.

Table 9. Construct Reliability and Validity: An Overview

	Cronbach's alpha	***Composite Reliability (rho_a)***	***Composite Reliability (rho_c)***	***Average Variance Extracted (AVE)***
FCF	0.244	0.27	0.716	0.565
FP	0.723	0.765	0.827	0.552

Source: SmartPLS 4

The results, presented in Table 9, indicate a substantial improvement in the measurement quality of the FP construct. Specifically, the AVE value for FP increases to 0.552, exceeding the recommended threshold of 0.50 and confirming adequate convergent validity. In addition, both composite reliability measures (ρa and ρc) remain above 0.70, indicating satisfactory internal consistency reliability.

Although Cronbach's alpha and ρa for FCF are relatively low, these indices are not decisive in PLS-SEM for multidimensional financial constructs measured with a limited number of indicators. The acceptable composite reliability (ρc > 0.70) and AVE (> 0.50) confirm that the free cash flow construct is measured reliably and validly, consistent with methodological guidelines proposed by Hair et al. (2019). Table 10 presents the second assessment of multicollinearity based on VIF values after removing problematic indicators and incorporating the moderating interaction term into the model.

The results suggests that all inner VIF values are well below the conservative threshold of 3.0, indicating the absence of multicollinearity concerns among the predictor constructs. This finding confirms that the refinement process has effectively eliminated redundant variance and enhanced the statistical stability of the model.

Importantly, the satisfactory VIF values demonstrate that the inclusion of the interaction term does not introduce collinearity-related distortions, thereby supporting the robustness of both the main and moderating effects. Following this systematic evaluation and elimination of inappropriate indicators, the final reduced structural model is presented in Figure 3, which serves as the basis for subsequent hypothesis testing and interpretation of structural path relationships.

Table 10. Collinearity Statistics: Inner VIF Values

	VIF
AC3	1
AGE	1
DA	1
EPS	1.455
EVA	1.352
FCF2	1.02
FCF4	1.02
GROWTH	1
MVPS	2.659
SIZE	1
TOBINQ	2.421
SIZE x DA	1

Source: SmartPLS 4

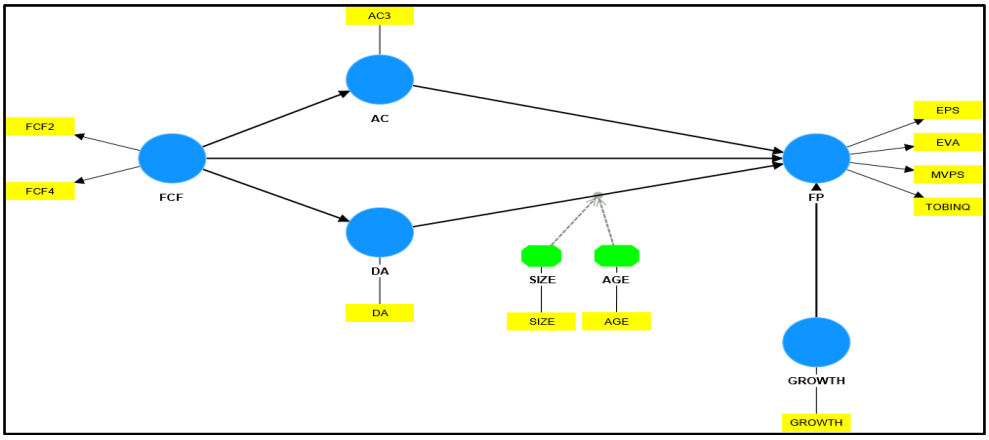


Fig. 3. Research Model 3
Source: SmartPLS 4

4-3-2. Evaluating the Statistical Significance and Magnitude of the Regression Coefficients

Table 11 reports the bootstrapping results of the structural model, capturing both direct and moderating effects on FP.

Table 11. Bootstrapping: Path Coefficients

	Predicted Sign	Original Sample (O)	Standard Deviation	P values
AC -> FP	-	0.017	0.025	0.515
DA -> FP	-	-0.154	0.027	0
FCF -> AC	-	-0.265	0.016	0
FCF -> DA	-	-0.341	0.016	0
FCF -> FP	+	0.317	0.02	0
GROWTH -> FP	+	-0.001	0.013	0.928
AGE x DA -> FP	-	-0.049	0.018	0.007
SIZE x DA -> FP	-	-0.052	0.02	0.007
AC x FCF -> FP	-	-0.108	0.021	0

Source: SmartPLS 4

The results show that FCF has a positive and statistically significant effect on FP ($\beta = 0.317$, $p < 0.001$), indicating that effective internal cash flow utilization enhances firm performance. Simultaneously, FCF significantly reduces AC ($\beta = -0.265$, $p < 0.001$) and DA ($\beta = -0.341$, $p <$

0.001), supporting the argument that internally generated funds mitigate agency frictions and lower dependence on debt financing.

In contrast, DA exerts a negative and significant impact on FP ($\beta = -0.154$, $p < 0.001$), suggesting that higher leverage undermines performance under the sampled conditions. AC does not have a significant direct effect on FP ($\beta = 0.017$, $p = 0.515$), implying that its influence is primarily conditional rather than direct. Consistent with this interpretation, all interaction terms are statistically significant. Specifically, the adverse effect of DA on FP intensifies in older and larger firms, as evidenced by the significant moderating effects of AGE × DA ($\beta = -0.049$, $p = 0.007$) and SIZE × DA ($\beta = -0.052$, $p = 0.007$). Furthermore, the interaction AC × FCF negatively moderates the FCF–FP relationship ($\beta = -0.108$, $p < 0.001$), indicating that elevated agency costs weaken the performance-enhancing role of free cash flow.

Overall, these findings underscore that FP is context-dependent, shaped by the joint effects of FCF, DA, and firm-specific characteristics, thereby highlighting the importance of a contingent perspective in evaluating the performance implications of internal liquidity and capital structure decisions. Table 12 presents the results of the specific indirect effects analysis.

Table 12. Bootstrapping: Specific Indirect Effect

	Predicted Sign	Original sample (O)	Standard deviation (STDEV)	P values
FCF -> DA -> FP	+	0.053	0.01	0
FCF -> AC -> FP	-	-0.004	0.007	0.517

Source: SmartPLS 4

The results show that DA serves as a significant mediating mechanism in the relationship between FCF and FP. Specifically, FCF exerts a positive indirect effect on FP through its negative effect on DA ($\beta = 0.053$, $p < 0.001$), indicating that firms with higher internal cash flows enhance performance by lowering debt intensity and mitigating financial risk.

By contrast, the indirect effect of FCF on FP via AC is not statistically significant ($\beta = -0.004$, $p = 0.517$), suggesting that AC does not operate as a mediating channel in this relationship. This finding reinforces earlier evidence that AC affects FP primarily through interaction effects rather than through direct or indirect transmission mechanisms.

Table 13. Bootstrapping: Total Effect

	Predicted Sign	Original Sample (O)	Standard Deviation (STDEV)	P values
AC -> FP	-	0.017	0.025	0.515
DA -> FP	-	-0.154	0.027	0
FCF -> AC	+	-0.265	0.016	0
FCF -> DA	-	-0.341	0.016	0
FCF -> FP	+	0.366	0.02	0
GROWTH -> FP	+	-0.001	0.013	0.928
AGE x DA -> FP	-	-0.049	0.018	0.007
SIZE x DA -> FP	-	-0.052	0.02	0.007
AC x FCF -> FP	-	-0.108	0.021	0

Source: SmartPLS 4

The total effects, presented in Table 13, consolidate the direct and indirect pathways through which FCF, AC, and DA influence FP. FCF exhibits a strong and significant total positive effect on FP ($\beta = 0.366$, $p = 0.000$), reflecting the combined influence of its direct enhancement of performance ($\beta = 0.317$) and its indirect effect through reduced DA ($\beta = 0.053$). This indicates that firms with higher FCF not only benefit from improved internal financing capacity and operational flexibility but also experience performance gains through lower debt exposure and reduced financial risk.

For DA, the total effect remains significantly negative ($\beta = -0.154$, $p = 0.000$), confirming that leverage consistently suppresses firm performance. This aligns with the direct effect results (Table 11), where DA negatively influenced FP, and emphasizes that the detrimental role of leverage persists regardless of mediating or moderating channels. In the Vietnamese context—characterized by high borrowing costs and limited capital market depth—this result reinforces the risks associated with excessive reliance on debt financing.

By contrast, AC shows no significant total effect on FP (β = 0.017, p = 0.515), mirroring its insignificant direct effect and the absence of any meaningful mediating role. Despite FCF's ability to reduce AC at the direct level, changes in AC do not lead to observable improvements in performance. This suggests that AC, as captured by accounting-based proxies, may not be an effective channel through which operational or governance efficiency influences firm outcomes in an emerging-market environment.

Overall, the total effect analysis confirms that FCF is the dominant driver of FP, operating through both direct and leverage-related pathways, whereas DA consistently undermines performance, and AC plays no substantive role in shaping firm outcomes.

4-3-3. Evaluating the Coefficient of Determination (R^2)

Table 14 reports the coefficients of determination (R^2) obtained from the bootstrapping procedure for the endogenous constructs.

Table 14. Bootstrapping: R Square

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P values
AC	0.07	0.071	0.009	8.047	0
DA	0.116	0.117	0.011	10.415	0
FP	0.2	0.206	0.019	10.638	0

Source: SmartPLS 4

The results suggest that the model explains 7.1% of the variance in AC, 11.7% in DA, and 20.6% in FP. According to established guidelines for PLS-SEM, R^2 values around 0.10–0.25 can be considered acceptable in exploratory research and in complex behavioral models, particularly within emerging market contexts where firm behavior is influenced by multiple unobservable institutional and governance factors (Hair et al., 2019).

Although the explanatory power of the model is moderate, the results indicate that FCF plays a statistically meaningful role in shaping AC, DA, and FP, particularly when mediating and moderating mechanisms are incorporated. The relatively higher R^2 for FP suggests that firm performance is more effectively explained by the joint effects of FCF, DA, and their interaction with firm characteristics, rather than by any single financial determinant. Overall, these findings support the adequacy of the structural model for theory testing while acknowledging that additional firm- and environment-specific variables may further enhance explanatory power in future research.

4-3-4. Evaluating the Effect Size (f2)

Table 15 presents the effect size (f^2) estimates for the structural relationships in the model.

Table 15. Bootstrapping: F Square

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P values
AC -> FP	0	0	0	0.234	0.815
AGE -> FP	0.002	0.002	0.002	0.961	0.336
DA -> FP	0.008	0.008	0.003	2.744	0.006
FCF -> AC	0.076	0.076	0.01	7.459	0
FCF -> DA	0.131	0.132	0.014	9.182	0
FCF -> FP	0.101	0.104	0.015	6.804	0
GROWTH -> FP	0	0	0	0.004	0.997
SIZE -> FP	0.061	0.062	0.011	5.791	0
AC x FCF -> FP	0.014	0.015	0.006	2.41	0.016
AGE x DA -> FP	0.003	0.003	0.002	1.308	0.191
SIZE x DA -> FP	0.003	0.003	0.002	1.281	0.2

Source: SmartPLS 4

Following Cohen's (1988) benchmarks, f^2 values below 0.02 indicate a negligible effect, values between 0.02 and 0.15 indicate a small effect, and values above 0.15 represent medium to large effects.

The results show that FCF exerts small but statistically significant effects on AC ($f^2 = 0.076$), DA ($f^2 = 0.131$), and FP ($f^2 = 0.101$), suggesting that internal cash flow availability plays a meaningful role in shaping agency behavior, leverage decisions, and firm performance. In contrast, AC, AGE, and GROWTH display negligible effect sizes on FP, consistent with their statistically insignificant path coefficients.

Regarding leverage, DA exhibits a small yet significant effect on FP ($f^2 = 0.008$), indicating that although leverage influences performance, its explanatory contribution remains limited in magnitude. The moderating effect of AC × FCF shows a small but significant effect size ($f^2 = 0.014$), while the interaction terms AGE × DA and SIZE × DA exhibit negligible effect sizes, suggesting that their moderating influence, although statistically detectable in path analysis, contributes modestly to the overall explanatory power of the model.

Overall, these findings indicate that the model's explanatory strength is driven primarily by FCF-related mechanisms, with other structural and moderating effects playing a secondary role.

5. Discussion

This study examines the interplay among FCF, AC, DA, and FP in Vietnamese listed firms during 2019–2023. The results support H_1, confirming that FCF positively affects FP, consistent with pecking order theory (Myers & Majluf, 1984) and prior evidence in emerging markets (Bhatti & Sajid, 2014; Mutende, 2018; Sapuan et al., 2021). Consistent with H_2, FCF is found to reduce AC, indicating that higher internal cash flows alleviate agency frictions by lowering financing constraints and monitoring intensity rather than exacerbating managerial opportunism. Although H_3 is grounded in agency theory (Jensen, 1986; Jensen & Meckling, 1976), the empirical results indicate that AC does not exert a statistically significant direct effect on FP among Vietnamese listed firms during 2019–2023. This finding reflects the limitations of proxy-based accounting measures of AC in an environment characterized by high ownership concentration and weak external monitoring (Phung & Mishra, 2016; Vo & Doan, 2014). Moreover, the COVID-19 shock altered firms' cost structures, weakening the expected negative AC–FP relationship (Sapuan et al., 2021). This result is consistent with prior evidence from Malaysia, Kenya, and Pakistan (Bhatti & Sajid, 2014; Mutende, 2018; Pacheco, 2018; Sapuan et al., 2021).

The findings also support H_4 and H_5, showing that FCF reduces DA and that DA negatively affects FP, consistent with pecking-order behavior and distress-dominated leverage dynamics in emerging markets during the Covid-19 period. Mediation analysis reveals that DA significantly mediates the FCF–FP relationship (H_7 supported), while AC does not (H_6 rejected), indicating that leverage reduction is the primary channel through which FCF enhances performance. Although the interaction terms for firm age and firm size are statistically significant, their f^2 values are very small, indicating negligible moderating effects. Therefore, H_8 and H_9 are rejected, suggesting that firm age and size do not meaningfully alter the DA–FP relationship. Leverage-related performance effects appear broadly homogeneous across firms during the study period.

6. Conclusion

This study shows that free cash flow is the primary determinant of firm performance in Vietnamese listed firms during 2019–2023, operating through both a direct effect and a dominant mediating role of financial leverage (DA). Leverage reduction emerges as the main channel through which internal cash flows enhance performance, establishing DA as the key mediator in the model. In contrast, agency costs neither directly affect performance nor mediate this relationship, indicating limited explanatory power in the emerging-market context, particularly during the COVID-19 period. Although firm size and age display statistically significant interaction terms, their negligible effect sizes suggest no meaningful moderating influence. Overall, the findings extend pecking order theory, partially align with trade-off theory, and challenge traditional agency-based predictions by highlighting financial leverage as the central mechanism linking free cash flow to firm performance in emerging markets.

Declarations

Ethics approval and consent to participate: Not applicable.
Consent for publication: Not applicable.

Availability of data and materials: We will provide research data if requested.
Conflict of interest: The authors declare that they do not have any conflicts of interest.
Funding: The authors received no financial support for the research, authorship, and/or publication of this paper.
Acknowledgments: Not applicable.

References

Abdel-Aziz, R. I., & Alrabba, H. M. (2023). The impact of corporate governance on agency costs in Jordanian service companies. *Information Sciences Letters, 12*(1), 97–111. https://doi.org/10.18576/isl/120107

Abu-Abbas, B. M., Alhmoud, T., & Algazo, F. A. (2019). Financial leverage and firm performance evidence from Amman stock exchange. *The European Journal of Comparative Economics*, *16*(2), 207-237. http://dx.doi.org/10.25428/1824-2979/201902-207-237

Abughniem, M. S., Al Aishat, M. A. H., & Hamdan, A. M. M. (2020). Free cash flow and firm performance: Empirical evidence from the Amman Stock Exchange. *International Journal of Innovation, Creativity and Change, 10*(12), 668–681.

Ahmed, A. M., Nugraha, D. P., & Hágen, I. (2023). The relationship between capital structure and firm performance: The moderating role of agency cost. *Risks, 11*(6), 102. https://doi.org/10.3390/risks11060102

Al-Sraheen, D. A. A. D. O., & Hamdan, M. N. (2022). An analysis of joint effects of Free cash flows and ownership concentration on corporate debt policy. *Global Business and Economics Review*, *26*(3), 353-363. https://doi.org/10.1504/GBER.2022.122386

Arhinful, R., & Radmehr, M. (2023). The effect of financial leverage on financial performance: evidence from non-financial institutions listed on the Tokyo stock market. *Journal of Capital Markets Studies*, *7*(1), 53-71. http://dx.doi.org/10.1108/JCMS-10-2022-0038

Batchimeg, B. (2017). Financial performance determinants of organizations: The case of Mongolian companies. *Journal of Competitiveness, 9*(3), 22–33. https://doi.org/10.7441/joc.2017.03.02

Bhatti, I., & Sajid, M. (2014). The impact of free cash flows and agency costs on firm performance: Empirical evidence from KSE 100 index of Pakistan. *Available at SSRN 3008871*. https://ssrn.com/abstract=3008871

Bodiyabaduge, D. M. P., & Rajakaruna Mudalige, H. K. T. (2024). *The impact of corporate social responsibility expenditure on financial performance: A quantitative study of financial institutions in Sri Lanka* [Master's thesis, Umeå University]. https://umu.diva-portal.org/smash/get/diva2:1870499/FULLTEXT01.pdf

Bolarinwa, S. T., Onyekwelu, U. L., Ojiakor, I., Orga, J. I., Duru, A. N., & Onuoha, C. E. (2026). Leverage and firm performance: Threshold evidence from the role of firm size. *Global Business Review, 27(3), 559–576.* https://doi.org/10.1177/09721509221109571

Chaklader, B., & Padmapriya, B. (2021). Impact of cash surplus on firm's capital structure: Validation of pecking order theory. Managerial Finance, 47(12), 1801–1816.https://doi.org/10.1108/MF-08-2020-0417

Chen, H. (2020, October 17-19). The impact of financial leverage on firm performance – Based on the moderating role of operating leverage. In *Proceedings of the Fifth International Conference on Economic and Business Management (FEBM 2020)*. Sanya, China. https://doi.org/10.2991/aebmr.k.201211.079

Chong, W. L., Ting, K. H., & Cheng, F. F. (2017). The performance of externally managed REITs in Asia: Further evidence from free cash flow and agency costs. *Journal of Property Investment & Finance*, *35*(2), 200–227. https://doi.org/10.1108/JPIF-08-2016-0067

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Dahiyat, A. A., Weshah, S. R., & Aldahiyat, M. (2021). Liquidity and solvency management and its impact on financial performance: Empirical evidence from Jordan. *The Journal of Asian Finance, Economics and Business*, *8*(5), 135–141. https://doi.org/10.13106/jafeb.2021.vol8.no5.0135

Dinh, H. T., & Pham, C. D. (2020).The effect of capital structure on financial performance of Vietnamese listing pharmaceutical enterprises. *The Journal of Asian Finance, Economics and Business*, *7*(9), 329-340. https://doi.org/10.13106/jafeb.2020.vol7.no9.329

Dodoo, R. N. A., Kumi, M., & Mangudhla, T. (2023). The effect of capital structure on firm performance: empirical evidence from emerging economy. *EuroMed Journal of Management, 5(1), 83–99.* https://doi.org/10.1504/emjm.2023.128241

Duru, A., Iyengar, R. J., & Zampelli, E. M. (2016). The dynamic relationship between CEO duality and firm performance: The moderating role of board independence. *Journal of Business Research*, *69*(10), 4269–4277. https://doi.org/10.1016/j.jbusres.2016.04.001

Elema, B. D., Matanda, J., & Roche, C. (2024). Agency costs and financial performance of licensed insurers in Kenya. *International Academic Journal of Economics and Finance*, *4*(2), 90-103. https://iajournals.org/articles/iajef_v4_i2_90_103.pdf

Farouk, M. A., Madaki, D., & Dachomo, G. P. (2024). Liquidity assets and financial performance of listed consumer firms in Nigeria. *Nigerian Journal of Management Sciences, 25*(1b), 368–379. https://nigerianjournalofmanagementsciences.com/wp-content/uploads/2024/06/LIQUIDITY-ASSETS-ON-FINANCIAL.pdf

Ghanbari, M., Haidari, F., Nazarzadeh, S., & Abasi, B. (2015). The relationship between cash flow and financial performance of accepted companies in the Tehran Stock Exchange. *MAGNT Research Report, 3*(2), 1829–1841.

Geertsema, P., & Lu, H. (2023). Relative valuation with machine learning. Journal of Accounting Research, 61(1), 329–376.https://doi.org/10.1111/1475-679X.12464

Guizani, M. (2017). Free cash flow, agency cost and dividend policy of sharia-compliant and non-sharia-compliant firms. *International Journal of Economics and Management*, *11*(2), 355–370.

Gul, F. A., & Tsui, J. S. L. (2001). Free cash flow, debt monitoring, and audit pricing: Further evidence on the role of director equity ownership. *Auditing: A Journal of Practice & Theory*, *20*(2), 71–84. https://doi.org/10.2308/aud.2001.20.2.71

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial least squares structural equation modeling (PLS-SEM) using R: A workbook*. Springer. https://doi.org/10.1007/978-3-030-80519-7

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2-24. https://doi.org/10.1108/EBR-11-2018-0203

Henry, D. (2010). Agency costs, ownership structure and corporate governance compliance: A private contracting perspective. *Pacific-Basin Finance Journal*, *18*(1), 24–46. https://doi.org/10.1016/j.pacfin.2009.05.004

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, *43*, 115-135. https://doi.org/10.1007/s11747-014-0403-8

Hoang, L. D., Tran, M. T., Pham, V. T. N., Tran, P. L., & Ta, T. P. (2019). Impact of agency costs on firm performance: Evidence from Vietnam. *Organizations and Markets in Emerging Economies*, *10*(2), 294–309. https://doi.org/10.15388/omee.2019.10.15

Holmes, S., & Kent, P. (1991). An empirical analysis of the financial structure of small and large Australian manufacturing enterprises. *Journal of Small Business Finance, 1(2), 141–154.* https://doi.org/10.57229/2373-1761.1118

Houqe, M. N., Opare, S., Zahir-ul-Hassan, M. K., & Ahmed, K. (2022). The effects of carbon emissions and agency costs on firm performance. *Journal of Risk and Financial Management*, *15*(4), 152. https://doi.org/10.3390/jrfm15040152

Ibhagui, O. W., & Olokoyo, F. O. (2018). Leverage and firm performance: New evidence on the role of firm size. *The North American Journal of Economics and Finance*, *45*, 57-82. https://doi.org/10.1016/j.najef.2018.02.002

Ilyukhin, E. (2015). The impact of financial leverage on firm performance: Evidence from Russia. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.2589013

Iqbal, U., & Usman, M. (2018). Impact of financial leverage on firm performance: Textile composite companies of Pakistan. *SEISENSE Journal of Management*, *1*(2), 70–78. https://doi.org/10.33215/sjom.v1i2.13

Jaggi, B., & Gul, F. A. (1999). An analysis of joint effects of investment opportunity set, free cash flows and size on corporate debt policy. Review of Quantitative Finance and Accounting, 12(4), 371–381. https://doi.org/10.1023/A:1008354509316

Jensen, M. C. (1986). Agency costs of Free cash flow, corporate finance, and takeovers. *The American Economic Review*, *76*(2), 323-329. http://papers.ssrn.com/abstract=99580

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3(4),* 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Khair, W., Diantimala, Y., & Yusmita, F. (2023). The effect of firm financial performance, free cash flow and cash holding on overinvestment. *Journal of Accounting, Finance and Auditing Studies*, *9*(3), 289-306. http://dx.doi.org/10.32602/jafas.2023.034

Khan, A. G. (2012). The relationship of capital structure decisions with firm performance: A study of the engineering sector of Pakistan. *International Journal of Accounting and Financial Reporting*, *2*(1), 245–262. https://doi.org/10.5296/ijafr.v2i1.1825

Khan, M. J., Saleem, F., Ud Din, S., & Khan, M. Y. (2024). Nexus between boardroom independence and firm financial performance: Evidence from South Asian emerging market. *Humanities and Social Sciences Communications*, *11*, Article 590. https://doi.org/10.1057/s41599-024-02952-3

Khidmat, W. B., & Rehman, M. U. (2014). The impact of free cash flows and agency costs on firm performance — An empirical analysis of KSE listed companies of Pakistan. *Journal of Financial Engineering*, *01*(03), 1450027. https://doi.org/10.1142/s2345768614500275

Kieschnick, R., & Moussawi, R. (2018). Firm age, corporate governance, and capital structure choices. Journal of Corporate Finance, 48, 597–614.https://doi.org/10.1016/j.jcorpfin.2017.12.011

Kontuš, E. (2021). Agency costs, capital structure and corporate performance: A survey of Croatian, Slovenian and Czech listed companies. *Ekonomski vjesnik*, *34*(1), 73–85. https://doi.org/10.51680/ev.34.1.6

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, *28*(4), 911-922. https://doi.org/10.2307/2978343

Lachheb, A., & Slim, C. (2017). The impact of free cash flow and agency costs on firm performance. *International Journal of Management and Applied Science*, *3*(7), 94-101. https://ijmas.iraj.in/paper_detail.php?name=The_Impact_of_Free_Cash_Flow_and_Agency_Costs_on_Firm_Performance&paper_id=8616

Lang, L. H., Stulz, R., & Walkling, R. A. (1991). A test of the free cash flow hypothesis: The case of bidder returns. *Journal of Financial Economics*, *29*(2), 315-335. https://doi.org/10.1016/0304-405X(91)90005-5

Le Thi, M., Giang, L., & Thoa. T. H. (2022). Tác động của dòng tiền tự do lên hiệu quả hoạt động của các doanh nghiệp xây dựng niêm yết trên sàn giao dịch chứng khoán Việt Nam. *Tạp chí Công thương số 17, tháng 7 năm 2022*. https://tinyurl.com/mrx5sdzp

Lê Hoàng, V., & Thu, P. P. (2022). 'Đòn bẩy tài chính và hiệu quả tài chính của các doanh nghiệp niêm yết tại Việt Nam khi có điều tiết bởi quy mô doanh nghiệp', *Tạp chí Kinh tế và Phát triển, 296, 43-51*. https://js.ktpt.edu.vn/index.php/jed/article/view/92/107

Linda, L., Saputra, M., Fuadi, R., & Fadhlia, W. (2024). Can governance mechanisms minimize agency costs? *Jurnal Penelitian Pendidikan Indonesia (JPPI)*, *10*(2), 323-331. http://dx.doi.org/10.29210/020242944

Listiadi, A. (2023). The effect of financial performance on the Tobin's Q value of company investment. *International Journal of Scientific Research and Management*, *11*(12), 5566–5574. https://doi.org/10.18535/ijsrm/v11i12.em07

Mahanavami, G. A. (2023). Free cash flow, biaya keagenan dan kebijakan dividen. *Jurnal Ilmiah Satyagraha*, *6*(2), 40-63. https://doi.org/10.47532/jis.v6i2.816

Mahadwartha, P. A., & Ismiyanti, F. (2008). Debt policy, free cash flow hypothesis, and balancing of agency theory through ownership: Evidence from Indonesia. Corporate Ownership & Control, 5(2, Continued 2), 256–263. https://doi.org/10.22495/cocv5i2c2p2

Mallinguh, E., Wasike, C., & Zoltan, Z. (2020). The business sector, firm age, and performance: The mediating role of foreign ownership and financial leverage. *International Journal of Financial Studies*, *8*(4), 79. https://doi.org/10.3390/ijfs8040079

Matemilola, B. T., Bany-Ariffin, A. N., Nassir, A. M., & Azman-Saini, W. N. W. (2017). Moderating effects of firm age on the relationship between debt and stock returns. Journal of Asia-Pacific Business, 18(1), 81–96.https://doi.org/10.1080/10599231.2017.1272999

Mensah, L., Bein, M. A., & Arhinful, R. (2025). The impact of capital structure on business growth under IFRS adoption: Evidence from firms listed in the Frankfurt Stock Exchange. SAGE Open, 15(2). https://doi.org/10.1177/21582440251336533

Mutende, E. A. (2018).Free cash flows, agency costs and performance of firms listed at the Nairobi Securities Exchange. *Pan-African Journal of Business Management*, *1*(2), 1-20. https://doi.org/10.61538/pajbm.v1i2.322

Mutumanikam, P. R., & Adelin, D. (2024). The impact of financial leverage on firm performance in emerging markets: An empirical analysis. *Dinasti Accounting Review*, *2*(1), 40–46. https://doi.org/10.38035/dar.v2i1.1037

Muzakki, M. R., & Gandakusuma, I. (2023). The impacts of free cash flow and agency cost on firm performance. *Jurnal Penelitian Ilmu Ekonomi*, *13*(2), 282–295. https://doi.org/10.30741/wiga.v13i2.1134

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, *39*(3), 574–592. https://doi.org/10.1111/j.1540-6261.1984.tb03646.x

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, *13*(2), 187–221. https://doi.org/10.1016/0304-405x(84)90023-0

Nam, N. H. P., & Tuyen, T. T. M. (2024). Impact of liquidity on capital structure and financial performance of non-financial-listed companies in the Vietnam stock market. Future Business Journal, 10, Article 126.https://doi.org/10.1186/s43093-024-00412-7

Ngo, V. T., Tram, T. X. H., & Vu, B. T. (2020). The impact of debt on corporate profitability: Evidence from Vietnam. *The Journal of Asian Finance, Economics and Business*, *7*(11), 835–842. https://doi.org/10.13106/jafeb.2020.vol7.no11.835

Nobanee, H., & Abraham, J. (2017). The impact of free cash flow, equity concentration and agency costs on firm's profitability. *Investment Management and Financial Innovations*, *14*(2), 19–26. https://doi.org/10.21511/imfi.14(2).2017.02

Nuhu, B. A., Dandago, K. I., Mohammad, L., Ado, A. B., & Abdulkarim, U. F. (2020). Impact of agency costs on financial performance of listed consumer goods companies in Nigeria. *The Journal of Management Theory and Practice (JMTP)*, *1*(3), 51-55. http://dx.doi.org/10.37231/jmtp.2020.1.3.51

Nurjanah, Y., & Prasetyo, D. M. (2024). Analysis of the use of return on asset, return on equity, and economic value added in assessing company financial performance. *Jurnal Ilmiah Akuntansi Kesatuan*, *12*(2), 321–332. https://doi.org/10.37641/jiakes.v12i2.2055

Omodara, O. V., Omodara, A. F., & Peter, S. I. (2024). Financial leverage and firm performance: a panel data analysis of nigerian manufacturing firms. *Fuoye Journal of Accounting and Management, 7*(1). https://www.fjam.fuoye.edu.ng/index.php/fjam/article/view/210/158

Pacheco, A. F. R. (2018). *The impact of Free cash flow and Agency costs on firm's performance: European evidence* [Master's thesis, Universidade de Lisboa]. https://hdl.handle.net/10400.5/17713

Park, K., & Jang, S. C. (2013). Capital structure, free cash flow, diversification and firm performance: A holistic analysis. International Journal of Hospitality Management, 33, 51–63.https://doi.org/10.1016/j.ijhm.2013.01.007

Phung, D. N., & Mishra, A. V. (2016). Ownership structure and firm performance: Evidence from Vietnamese listed firms. *Australian Economic Papers, 55*(1), 63–98. https://doi.org/10.1111/1467-8454.12056

Purnawarman, A., & Handayati, P. (2021). The effect of free cash flow (FCF) on agency cost and financial performance in financial sector companies registered in indonesia stock exchange (BEI) 2015-2016. *Jurnal Ekonomi, Bisnis Dan Pendidikan, 1*(4), 305–312. https://doi.org/10.17977/um066v1i42021p305-312

Putri, A. N., & Aris, M. A. (2023). Implikasi kepemilikan institusional, free cash flow, growth opportunity, dan investment opportunity set terhadap nilai perusahaan. *Jurnal Ilmiah Manajemen, Ekonomi, & Akuntansi (MEA), 7*(2), 1662-1675. https://doi.org/10.31955/mea.v7i2.3260

Rajan, R. G., & Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance, 50(5),* 1421–1460. http://dx.doi.org/10.1111/j.1540-6261.1995.tb05184.x

Ramli, N. A., Latan, H., & Solovida, G. T. (2019). Determinants of capital structure and firm financial performance—A PLS-SEM approach: Evidence from Malaysia and Indonesia. *The Quarterly Review of Economics and Finance, 71*, 148-160. https://doi.org/10.1016/j.qref.2018.07.001

Rezaei, M., & Jafari, S. M. (2015). Identifying the relationship between financial leverage and cash flows of the companies listed in Tehran stock exchange. *Indian Journal of Science and Technology, 8*(27). https://doi.org/10.17485/ijst/2015/v8i27/82942

Richardson, S. (2006). Over-investment of free cash flow. *Review of Accounting Studies, 11*(2–3), 159–189. https://doi.org/10.1007/s11142-006-9012-1

Rohim, S. R. N., Kurnianti, D., & Nguyen, T. P. (2024). The impact of agency cost on firm performance. *Global Advances in Business Studies, 3*(1), 38-48. https://doi.org/10.55584/Gabs.003.01.4

Sapuan, N. M., Abdul Wahab, N., Fauzi, M. A., & Omonov, A. (2021). Analysing the impacts of free cash flow, agency cost and firm performance in public listed companies in Malaysia. *Journal of Governance and Integrity, 5*(1), 211-218. http://dx.doi.org/10.15282/jgi.5.1.2021.7061

Shumway, T. (2001). Forecasting bankruptcy more accurately: A simple hazard model. *The Journal of Business, 74*(1), 101–124. https://doi.org/10.1086/209665

Sifullah, H. M., Shelly, P. A., Uddin, M. N., Tabassum, T., & Uddin, M. A. (2024). Does financial leverage impact the financial performance of pharmaceutical companies in Bangladesh? *International Journal of Economics & Business Administration (IJEBA), 12*(2), 37-63. https://doi.org/10.35808/ijeba/841

Silvia, R., & Wangka, N. (2022). Economic value added and market value added as a measuring tool for financial performance. *International Journal of Social Science and Business, 6*(1), 135–141. https://doi.org/10.23887/ijssb.v6i1.30371

Stoiljković, A., Tomić, S., Leković, B., Uzelac, O., & Ćurčić, N. V. (2024). The impact of capital structure on the performance of Serbian manufacturing companies: Application of agency cost theory. *Sustainability, 16*(2), 869. https://doi.org/10.3390/su16020869

Tran Minh Tuan (2020). Nghiên cứu về tác động của chi phí đại diện đến hiệu quả hoạt động tại các doanh nghiệp niêm yết trên thị trường chứng khoán Việt Nam, *Luận án Tiến sĩ*, Trường Đại học Kinh tế Quốc dân. https://tinyurl.com/2p5fbpth

Tran Quang Chung (2022). Tác động của dòng tiền tự do và chi phí đại diện tới hiệu quả tài chính của doanh nghiệp niêm yết trên thị trường chứng khoán Việt Nam, *Luận án tiến sĩ*, Trường Đại học Kinh tế Quốc dân. https://tinyurl.com/ywymhaps

Umoru, B., Udobi-Owoloja, P. I., Oke, B. O., & Iyiegbuniwe, J. C.(2022). Effects of free cash flow and financial leverage on agency costs: Evidence from nigerian deposit money banks. In T. Okhankhuele (Ed.), *The frontiers of management sciences in Nigeria* (pp.195-215). University of Lagos Press https://bom.so/JTE4Th

Vo, X. V., & Doan, T. L. C. (2014). Dòng tiền tự do và hiệu quả hoạt động của các doanh nghiệp Việt Nam. *Tạp chí Phát triển kinh tế, 280*, 61-77. https://vjol.info.vn/index.php/PTKT/article/view/34582

Wambua, P. (2013). Effects of agency costs on financial performance of companies listed at the Nairobi Securities Exchange. *International Journal of Social Sciences and Entrepreneurship, 1*(5), 587-607. https://jkuat.academia.edu/PatrickWambua

Wang, G. Y. (2010). The impacts of Free cash flows and Agency costs on firm performance. *Journal of Service Science and Management, 3*(4), 408-418. http://dx.doi.org/10.4236/jssm.2010.34047

Widiastari, P. A., & Yasa, G. W. (2018). Pengaruh profitabilitas, free cash flow, dan ukuran perusahaan pada nilai perusahaan. *E-Jurnal Akuntansi*, *23*(2), 957-981. https://doi.org/10.24843/EJA.2018.v23.i02.p06

Yahaya, O. A., & Tijjani, B. (2021). Size, age and leverage of Nigeria quoted oil and gas corporations. *Advanced International Journal of Banking, Accounting and Finance*, *3*(6), 51-60. http://dx.doi.org/10.35631/AIJBAF.36005

Yeo, H. J. (2018). Role of free cash flows in making investment and dividend decisions: The case of the shipping industry. *The Asian Journal of Shipping and Logistics*, *34*(2), 113-118. https://doi.org/10.1016/j.ajsl.2018.06.007

Yilmaz, I., & Samour, A. (2024). The effect of cash holdings on financial performance: Evidence from Middle Eastern and North African countries. *Journal of Risk and Financial Management, 17*(2), 53. https://doi.org/10.3390/jrfm17020053

Zhu, H., Gu, H., & Halepoto, H. (2022). Can fulfillment of social responsibility enable enterprises to innovate? The role of corporate financialization and agency costs. *Sustainability*, *14*(21), 13799. https://doi.org/10.3390/su142113799