



## CFOs as Innovators in Debt Maturity Choices: New Evidence from an Asian Emerging Market

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### Abstract

This study aims to examine the role of the Chief Financial Officer (CFO) as an agent of innovation in shaping corporate debt maturity decisions within the framework of Upper Echelons Theory. Data were collected from 312 non-financial firms listed in Vietnam from 2011 to 2023, spanning 10 sectors, with focused analysis on three sectors - Industrials, Materials, and Consumer Staples - to highlight their specific characteristics. The personal traits of CFOs, including gender, age, education, and expertise, were analyzed in relation to debt maturity structures, measured by the long-term debt ratio (LTDR) and weighted average debt maturity (WAM). To explore these relationships, various regression methods - OLS, FEM, REM, FGLS, and GMM - were applied. The results reveal that CFO attributes significantly affect debt maturity choices, emphasising their innovative role in corporate financial management. Moreover, this influence varies among sectors: Industrials, Materials, and Consumer Staples exhibit notable differences from other sectors. The study advances the literature by emphasising the pivotal role of CFOs in financial innovation and by extending Upper Echelons Theory. Empirically, it provides novel evidence from an emerging market context, a setting that remains underexplored. Practically, the findings offer insights for firms and investors in selecting and developing CFOs as strategic resources to enhance adaptability and financial stability.

### Keywords:

Chief Financial Officer (CFO);  
Top Leadership Characteristics;  
Debt Maturity;  
Upper Echelons Theory;  
Emerging Markets;  
Vietnamese Listed Companies.

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## 1- Introduction

In corporate finance literature, debt maturity decisions are a key part of corporate financial management. They help control liquidity risk and reduce conflicts of interest between shareholders and managers [1, 2]. The decision on debt maturity will affect the financial security of the enterprise, which is one of the critical challenges and conditions that companies face in the development process [3]. The research tradition has concentrated heavily on macro factors (e.g., capital market conditions, interest rates, economic uncertainty) and micro factors (e.g., profitability, size, growth opportunities) to explain variations in debt maturity [4, 5]. However, these approaches tend to underestimate the influence of people - particularly senior finance leaders - in shaping strategic financial decisions. In this context, the CFO has emerged as a key figure in corporate financial management. The emergence of the CFO role may have been rooted in a financially oriented view of corporate control, which implies that individuals with strong financial expertise are best equipped to manage the firm effectively [6]. The CFO is central in debt maturity decisions, directly planning, negotiating, and managing debt policies [7]. Personal characteristics such as gender, age, education, and professional background can affect how CFOs approach innovation in corporate finance, especially concerning debt maturity decisions. However, the prior research had examined this relationship in a fragmented manner, frequently concentrating on specific CFO characteristics in isolation rather than adopting an integrated approach [7-11]. Viewing CFOs as "innovators" in financial management offers a new perspective, complementing the Upper Echelons Theory, which suggests that top leadership characteristics shape organizational outcomes [12]. In the context of increasingly varied

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executive teams [10, 13, 14], examining this link is crucial to enhance the behavioral finance literature and assist firms in selecting financial leaders whose profiles correspond with long-term capital structure goals.

CFOs are widely recognized as the main financial managers of organizations and rank as the second most influential executives after the CEO in corporate governance [15]. They oversee financial reporting and internal control systems and shape the company's spending and investment strategies [9]. Experienced CFOs tend to prefer long-term debt to mitigate refinancing risk, whereas younger or less experienced CFOs often favor short-term debt to capitalize on immediate opportunities [9-11]. The expanding strategic role of CFOs as "financial architects" in corporate capital management has also been documented [6]. Nonetheless, much of the existing evidence pertains to developed economies, where financial systems are transparent and access to capital is varied [13, 14, 16]. In contrast, emerging markets—characterized by macroeconomic instability, information asymmetries, limited institutional quality, and heavy reliance on bank credit—are underexplored in terms of the role of CFOs in debt maturity decisions. Moreover, applying classical theoretical models to emerging markets presents substantial challenges, necessitating theoretical adaptations or the development of new frameworks [17]. Vietnam exemplifies this: despite rapid credit growth, the corporate bond market remains limited, reflecting firms' heavy dependence on banks. In this context, the personal characteristics of CFOs may directly influence debt maturity through negotiation and risk management capabilities.

Notably, in addition to addressing gaps in research on emerging markets, there is a lack of studies assessing the impact of CFO characteristics by industry. Few investigations have explored how CFOs may be viewed as innovators in shaping corporate debt strategies or how different industries might influence this relationship. Building on these gaps, this study aims to explore the role of the CFO as an agent of innovation in corporate debt maturity decisions. Specifically, it examines how CFOs' personal characteristics impact debt maturity structure and analyzes differences across industries, concentrating on the sectors of Industrials, Materials, and Consumer Discretionary, which are vital in emerging markets such as Vietnam.

Therefore, the study centers on three key questions: (i) How do CFOs' personal characteristics influence corporate debt maturity structure?, (ii) How do these characteristics reflect the innovative role of CFOs in financial management?, and (iii) Does the magnitude and direction of CFOs' impact on debt maturity differ significantly across the Industrials, Materials, and Consumer Discretionary sectors?

To answer these questions, the study uses panel data from 312 non-financial companies listed in Vietnam from 2011 to 2023, analyzing the entire sample and focusing on three main sectors: Industrials, Materials, and Consumer Discretionary. Debt maturity is measured by the long-term debt ratio (LTDR) and weighted average debt maturity (WAM). CFO characteristics include gender, age, postgraduate education, and financial expertise. The methodology employs a two-step system GMM model, comparing it with OLS, FEM, REM, FGLS, GMM, and GMM-Robust to ensure reliable results.

The study makes three primary contributions: (1) Theoretical contribution: Extending the Upper Echelons Theory by placing the CFO - rather than the CEO - at the center of financial innovation. The study highlights that debt maturity decisions are not only technical but also influenced by the personal characteristics of the finance leader; (2) Empirical contributions: Providing new evidence from an emerging market, with data from 312 listed companies in Vietnam from 2011 to 2023. The results clearly demonstrate industry differences, suggesting that the industry context plays an essential moderating role in the relationship between CFO and debt maturity; and (3) Practical contributions: Offering implications for businesses and investors on the selection, appointment, and development of CFOs to enhance stability and innovation in financial management. This is especially significant in emerging markets, where financial risks and dependence on debt capital are often substantial.

The paper is organized as follows: Section 2 presents the theoretical framework and research hypotheses; Section 3 describes the data and methodology; Section 4 analyzes and discusses the results; and Section 5 concludes with recommendations.

## **2- Theoretical Background and Hypotheses Development**

### ***2-1- Theoretical Framework***

The Upper Echelons Theory [7] is one of the most widely applied theoretical frameworks in financial and organizational behavior research. This theory suggests that organizational performance was an indirect outcome of top executives' background characteristics, mediated via their strategic decisions. Top executives' demographic and cognitive traits partly shape organizational outcomes. The Upper Echelon Characteristics can be classified into two categories: Observable Characteristics (including age, functional tracks, other career experiences, education, socioeconomic roots, financial position, and group characteristics) and psychological traits (cognitive base values). These characteristics collectively shape the cognitive lens through which executives perceive and interpret the objective environment. Managers do not make isolated decisions; their values, experiences, and personal characteristics systematically influence strategic choices. In the context of corporate finance, this perspective elevates the CFO from merely a technical manager to a decision-maker whose individual traits impact the development of financial policies. Applying this framework to debt maturity decisions allows us to view CFOs as innovators, with age, gender, education,

and expertise shaping their approaches to financial structuring. Accordingly, the Upper Echelons perspective provides a theoretical basis for understanding why diversity among CFOs results in different debt maturity strategies.

Complementing this perspective, the Theory of Liquidity Risk, Liquidity Creation, and Financial Fragility [18] emphasizes the trade-offs involved in firms' debt maturity structures. Short-term debt enhances liquidity and discipline but may increase rollover risk, whereas long-term debt offers stability but might restrict flexibility in liquidity creation. Finding the right balance of debt maturities is essential for managing liquidity risk and financial fragility. Within this framework, the role of the CFO becomes crucial. As financial architects, CFOs decide how the firm positions itself along the risk-liquidity spectrum, reflecting their personal risk preferences and capacity for financial innovation.

Agency Theory, developed by Jensen & Meckling [19], suggests that financial decisions can lead to conflicts of interest between managers and shareholders or firms and creditors. The choice of debt maturity is a mechanism used to manage these agency costs. For instance, short-term debt imposes stricter market discipline, while long-term debt helps to reduce refinancing risk. The characteristics of CFOs, such as their age, education, and financial experience, may influence their perception of these conflicts and how they address them.

Signaling Theory, developed by Ross [20], suggests that senior executives often use financial decisions, such as the debt maturity structure, to convey their managerial quality and the company's financial prospects to the market. A CFO with a strong educational background or experience in professional finance is more likely to choose long-term debt as a positive signal of the firm's credibility and stability. Conversely, an inexperienced CFO may favor short-term debt due to concerns about credit risk or the perceived reluctance of lenders to offer favorable terms.

The combined insights from the Upper Echelons Theory and the Theory of Liquidity Risk, Liquidity Creation, Financial Fragility, Agency Theory, and Signaling Theory provide a comprehensive explanation and establish a solid foundation for this study. The Upper Echelons Theory emphasizes the importance of CFO characteristics as drivers of financial decision-making, while [18]'s framework explains why debt maturity choices are crucial for firm stability. By integrating these theories, we propose that CFOs, acting as innovators, not only embed their personal attributes into debt maturity structures but also influence the firm's exposure to liquidity risks and fragility. This theoretical integration offers a persuasive rationale for examining how CFO heterogeneity shapes debt maturity decisions across industries within an emerging market context.

### **2-2- CFO Gender and Debt Maturity**

According to the Upper Echelons Theory, gender influences financial decision-making through differences in risk perception and behavioral tendencies. Empirical research indicates that female CFOs tend to be more conservative, favoring safety and limiting the use of long-term debt due to concerns about market risk and monitoring from [8, 10, 13]. In contrast, male CFOs tend to be less risk-averse and are more likely to utilize long-term debt instruments to fund growth and expansion. This suggests that the presence of female CFOs may be associated with lower LTDR and shorter WAM, indicating a more cautious approach to risk management.

This effect is no longer consistent across sectors. In highly volatile sectors such as Manufacturing or Materials, gender differences may be more pronounced due to the high financial risk pressure, which may lead female CFOs to favor more conservative strategies. Conversely, in industries with stable cash flows, such as Consumer Staples, the gender gap in debt maturity decisions may narrow. This approach exemplifies "innovation" in risk management, where gender becomes a source of differences in financial strategies.

Given the potential divergence between long-term debt ratio and average maturity, we hypothesize:

***H<sub>1a</sub>***: Female CFOs are likelier to choose a long-term debt ratio (LTDR) than male CFOs.

***H<sub>1b</sub>***: Female CFOs are likelier to choose a longer weighted average maturity (WAM) than male CFOs.

Industry expectations: CFO gender is stronger in the Consumer Staples industry, while in capital-intensive industries, the effect may be driven by long-term financial characteristics.

### **2-3- CFOs' Age and Debt Maturity**

According to the Upper Echelons Theory, age reflects managers' experience, vision, and risk preferences. Young CFOs are often more active, risk-averse, and willing to utilize larger LTDRs to finance growth. In contrast, older CFOs are more conservative, value stability, and avoid long-term debt burdens. Instead of employing more long-term debt, they usually reduce LTDRs while increasing WAMs by favoring medium-term debt, aiming to balance cash flow stability and minimize the risk of very long-term debt. Additionally, their experience often encourages them to capitalize on market conditions when short-term and medium-term interest rates are low, favoring medium-term debt over long-term debt. This mechanism aligns with the economic model of optimal debt maturity choice, demonstrating that long-term debt increases as debt maturity becomes excessive, as with overdue debt [9]. Evidence from Vietnam also indicates that asset size and structure influence LTDR and WAM [21], implying that CFO age may lead to adaptable debt maturity decisions.

This effect also varies by industry. Older CFOs tend to be more cautious in volatile sectors such as Materials, resulting in a more noticeable reduction in LTDR. In stable sectors like Consumer Staples, age differences are less significant.

Therefore, our hypothesis  $H_2$  is formulated as follows:

**$H_{2a}$ :** Older CFOs are likelier to choose lower long-term debt ratios (LTDR) than younger CFOs.

**$H_{2b}$ :** Older CFOs are more inclined to select longer weighted average maturity (WAM) than younger CFOs.

Industry expectations: The impact of CFO age on LTDR and WAM is more evident in highly volatile industries (e.g., Materials), whereas it is less pronounced in stable sectors (e.g., Consumer Staples).

#### ***2-4- CFOs' Education and Debt Maturity***

Highly educated CFOs are generally well-trained in risk management and strategic thinking. They recognize that long-term debt (LTDR) involves high capital costs and many constraints. Consequently, they can design an optimal debt structure, often favoring medium-term debt to balance reduced refinancing risks (compared to short-term debt) with limited interest costs and constraints (compared to long-term debt). Increasing the weighted-average debt maturity (WAM) without raising LTDR indicates a sound financial strategy: shifting from short-term to medium-term debt. This suggests highly educated CFOs are more cautious with long-term debt but effectively manage risks, thereby increasing WAM.

Previous research also supports this perspective. Harymawan et al. (2022) [22] assert that higher-education CFOs demonstrate superior professional competence, improving the quality of financial reporting. Pavlatos (2012) [23] finds that higher education in CFOs enhances firm performance. Moreover, Custódio & Metzger (2014) [24] argue that higher education helps CFOs develop analytical and risk management skills, boosting their confidence in liquidity management. From the perspective of Upper Echelons Theory, higher education enables CFOs to perform more thorough financial analysis and access long-term capital more efficiently. Meanwhile, the Liquidity Risk Trade-off Theory suggests that highly educated CFOs may prefer short-term debt to reduce costs, resulting in lower LTDR but still increasing WAM. Therefore, the impact of education can be dual: (i) encouraging the use of long-term debt through better governance, or (ii) maintaining low LTDR due to financial prudence. This effect varies across industries. In the Industrial sector, which requires long-term capital for infrastructure investment, CFOs with higher education are more likely to opt for higher LTDR and WAM. Conversely, this effect is less noticeable in the Consumer Staples sector, which is characterized by low risk and stable capital needs.

Based on this, the following research hypotheses are proposed:

**$H_{3a}$ :** CFOs with higher education tend to choose lower long-term debt ratios (LTDR).

**$H_{3b}$ :** CFOs with higher education tend to prefer higher weighted average debt maturity (WAM).

Industry expectations: The influence of education is more substantial in industries that require long-term capital (Industrial) and weaker in stable industries (Consumer Staples).

#### ***2-5- CFO Financial Expertise and Debt Maturity***

CFOs with financial expertise often possess a deep understanding of capital markets, hedging instruments, and interest rate fluctuations. This knowledge enables them to analyze debt structures better, negotiate effectively with creditors, and select appropriate financing strategies. A CFO is considered to have a finance background if they possess a professional qualification, such as a degree, diploma, or certification in finance, banking, accounting, or auditing, or if the CFO has relevant experience working in finance, accounting, auditing, or banking, such as an auditor, CFO, controller, or other accounting-related roles.

Regarding LTDR, CFOs with a financial background typically prioritize using long-term debt to reduce refinancing risks, aligning debt maturities with asset life cycles. This approach helps maintain financial stability and alleviates liquidity pressures during tight credit conditions.

Concerning WAM, financial expertise empowers CFOs to be more confident in accessing long-term sources of capital, thereby extending the average debt maturity. They can flexibly adjust the debt maturity structure, prioritizing short-term debt when the cost of capital is low, or opting for long-term debt when interest rate stability is necessary. According to the Theory of Liquidity Risk, Liquidity Creation, and Financial Fragility [18] CFOs with a finance background are more sensitive to refinancing risks and potential liquidity issues arising from short-term debt structures. Consequently, they structure debt more cautiously, aiding companies in optimizing debt arrangements amidst volatile market conditions.

Empirical evidence by Hoitash et al. [15] also indicates that CFOs with a finance background tend to adopt more conservative financing policies and limit debt usage to ensure financial stability, strengthening LTDR and increasing WAM. The influence of financial expertise also varies across industries. In the highly cyclical Materials sector, CFOs with financial expertise often modify their debt structures to control risk, which may reduce LTDR but still optimize WAM. Conversely, CFOs with financial expertise can sustain high LTDR and WAM thanks to steady cash flows and strong bargaining power in more stable industries such as Industrials or Consumer Staples.

From there, we propose the following hypothesis H<sub>4</sub>:

**H<sub>4a</sub>**: CFOs with financial expertise tend to favor higher long-term debt ratios (LTDR).

**H<sub>4b</sub>**: CFOs with financial expertise tend to select longer weighted average debt maturities (WAM).

Industry expectations: The influence of financial expertise is more pronounced in stable industries (Industrials, Consumer Staples) but becomes more complex in volatile industries (Materials).

Figure 1 presents the study's conceptual framework, illustrating the CFO's role as an innovation agent in debt maturity decisions and the industry context.

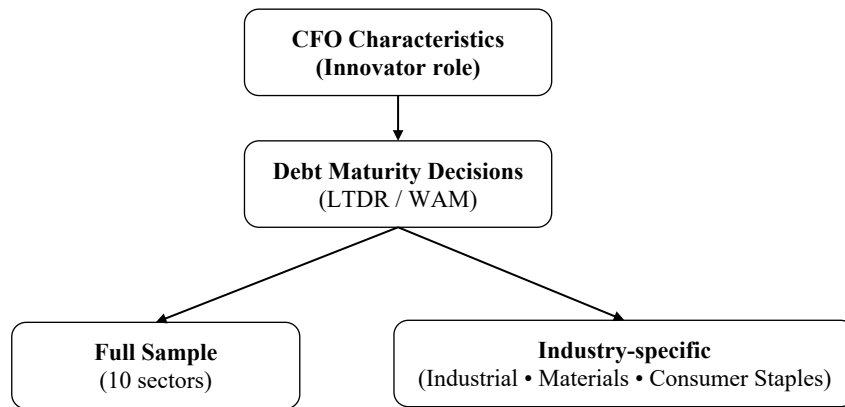


Figure 1. The Study's Conceptual Framework

### 3- Data and Analytical Model

#### 3-1- Data Sources and Research Samples

This study utilizes a robust balanced panel data set collected from non-financial companies listed in Vietnam for 13 years, from 2011 to 2023. The sample selection adheres to these criteria: (i) excluding enterprises in the financial, banking, insurance, and securities sectors due to their unique capital structures and significantly different management and accounting regulations; (ii) enterprises must have complete financial data necessary for variable calculation; and (iii) only companies with continuous audited financial statements throughout the period are included. After data processing and cleaning, the final research sample comprises 312 companies with 4,056 company-year observations, representing most non-financial manufacturing and service sectors listed on the Vietnamese stock market.

Information on CFOs' personal characteristics (gender, age, education, professional background) was manually gathered from annual reports, management reports, and corporate disclosures. Financial data were sourced from audited yearly financial statements and public databases. Macroeconomic variables such as GDP growth, inflation, and real interest rates were obtained from the World Bank database [25].

Vietnam was chosen because it is an emerging market with high levels of uncertainty, where CFOs have many opportunities to demonstrate financial innovation in debt maturity structure design. Combining micro data (firm and leader level) with macro data (GDP, inflation, real interest rates) enables controlling for institutional and economic contexts.

#### 3-2- Measurement of Research Variables and Analysis Model

##### 3-2-1- Dependent Variable

In this study, the dependent variable is corporate debt maturity (DEBM), measured using two common indicators in corporate finance:

**LTDR (Long-term Debt Ratio)**: Calculated as the long-term debt ratio to the company's total debt. This index indicates the company's preference for using long-term debt within its financial structure. A high LTDR suggests that the company relies more on long-term debt, which is often linked to creditworthiness, access to capital markets, and interest rate risk management. The LTDR variable has been widely utilized to measure debt maturity in numerous previous studies [4, 26, 27].

**WAM (Weighted Average Maturity)**: The weighted average maturity of debt, calculated based on the proportions of short-term and long-term debt within total outstanding debt. Compared to LTDR, WAM is a more advanced measure because it reflects the proportion of long-term debt and the maturity distribution across different debt instruments (1-

year debt, 2-year debt, 5-year debt, 10-year bonds). As such, WAM provides direct insight into debt maturity management policies, including financial flexibility and the capacity to respond to refinancing risks. The WAM variable has been utilized in numerous prior studies [28-30]. WAM is measured according to the formula:

$$WAM = \sum_{i=1}^n \left( \frac{Debt_i}{\sum_{j=1}^n Debt_j} * Maturity_i \right) \quad (1)$$

where,  $Debt_i$ : outstanding value of debt type  $i$ .;  $\sum_{j=1}^n Debt_j$ : total outstanding debt of the firm.;  $Maturity_i$ : remaining term of debt type  $i$  (1, 3, 5, 7, 10 years, depending on the research context).; and  $n$ : number of types of debt instruments used by the firm.

### 3-2-2- Main Independent Variables

Four key characteristics of the CFO serve as primary explanatory variables, namely:

**CFOGEN (CFO Gender):** This dummy variable is assigned a value of 1 if the CFO is female and 0 if male. According to the Upper Echelons Theory, a manager's gender can influence risk appetite and financial decisions, impacting the enterprise's debt maturity strategy. Studies often indicate that men are more overconfident than women [31]. The leader's gender variable has been used in many previous studies [13, 14]. Ginesti et al. (2021) [32] recognize that female CFOs positively correlate with R&D investment intensity.

**CFOAGE (CFO age):** A continuous variable representing the actual age of the CFO at the time of observation. Previous research indicates that older leaders tend to be more conservative and prefer safer debt structures. In contrast, younger leaders are generally more active and willing to take risks to capitalize on growth opportunities. Ginesti et al. (2021) [32] affirmed that older CFOs are positively linked to R&D investment intensity. However, Pavlatos (2012) [23] confirmed that the presence of older CFOs is positively connected to R&D investment intensity but negatively affects the quality of information technology.

**CFODEG (CFO Education):** This dummy variable is set to 1 if the CFO holds a postgraduate degree (MBA, master's, doctorate) and 0 otherwise. Higher education is believed to afford CFOs access to modern financial knowledge, risk management, and the ability to design optimal debt structures. Datta et al. (2023) [33] observe that hiring highly educated CFOs elicits positive market reactions and significantly enhances firm performance. Pavlatos (2012) [23] recognized that CFO education improves the utilization of cost management systems for decision-making, control, and performance evaluation. However, Nguyen & Nguyen (2024) [34] state that companies with highly educated CFOs are less likely to be profitable than others.

**CFOFIN (CFO Financial Experience):** A dummy variable that equals 1 if the CFO has financial expertise and 0 otherwise. CFOs with financial expertise typically understand the cost of debt, the term structure, and hedging instruments better. Dittmar & Duchin (2015) [35] acknowledge that policies vary depending on the manager's experience and career. Rashid (2020) [36] asserts that the presence of professional accountants on the senior management team and improved financial reporting quality are positively and significantly associated.

### 3-2-3- Control Variables

To reduce bias in estimation, the study includes control variables at both firm and macro levels, such as:

**FSIZE (Firm size):** Measured by the natural logarithm of total assets. Generally, larger firms are more creditworthy and have easier access to long-term debt, so a positive relationship with LTDR and WAM is expected. Most studies show that firm size positively influences liquidity [5, 28].

**LEV (Financial leverage):** Calculated as the total debt ratio to total assets. High leverage can increase refinancing risk, prompting firms to shorten debt maturity. Kashеfi Pour & Lasfer (2019) [37] find that well-protected investors lead firms to use reasonable financial leverage, resulting in an optimal debt maturity to maximize tax shields and minimize tax costs of equity.

**FIXR (Fixed assets ratio):** Derived from the natural logarithm of tangible fixed assets to total assets. Fixed assets serve as adequate collateral and are often associated with long-term debt, so a positive relationship is anticipated. Research by Kashеfi Pour & Lasfer (2019) [37] and Tayem (2023) [38] confirmed that FIX positively impacts debt maturity.

**AGROW (Asset Growth Rate):** Measured by the annual percentage growth in assets. High-growth firms have substantial capital needs and face credit risks, influencing debt maturity policies. Méndez (2013) [39] affirms that AGROW negatively affects debt maturity. Conversely, Orman & Köksal (2017) [30] indicated a negative but statistically insignificant effect of AGROW on debt maturity.

**ROA (Return on Assets):** Calculated by dividing net profit by total assets [40]. Highly profitable firms tend to be less reliant on long-term debt, often self-financing, and are expected to have a negative relationship with LTDR and WAM. Results vary; Tayem (2023) [38] identified a negative link between ROA and liquidity, whereas Al-Homaidi et al. (2020) [41] observe a positive one.

**RIR (Real Interest Rate):** The nominal interest rate adjusted for inflation. Elevated interest rates can affect debt maturity by influencing borrowing costs. The impact on liquidity varies; Dang (2020) [42] found no effect, while Chen & Mahajan (2010) [43] reported a positive influence.

**INF (Inflation):** The annual inflation rate. High inflation can increase interest rate risk, leading firms to prefer short-term debt. Its effect on liquidity differs; Dang (2020) [42] found no impact, whereas Chen & Mahajan (2010) [43] identified an adverse effect.

**GDP (GDP growth):** The annual GDP growth rate. Positive economic growth improves firms' access to long-term capital. Chen & Mahajan (2010) [43] observed a favorable effect of GDP growth on liquidity.

### 3-2-4- Analytical Model

The study employs a dynamic model and utilizes the 2-step System GMM method (Arellano-Bover/Blundell-Bond) to address endogeneity and the bidirectional relationship between debt maturity structure and firm characteristics. The general equation is formulated as follows:

$$DEBM_{i,t} = \alpha_0 + \alpha_1 DEBM_{i,t-1} + \beta INDVAR_{i,t} + \gamma Controls_{i,t} + \mu_i + \varepsilon_{i,t} \quad (2)$$

where,  $DEBM_{i,t}$ : represents the debt maturity (LTDR or WAM) of firm  $i$  at time  $t$ ;  $\alpha_1 DEBM_{i,t-1}$ : is the lagged debt maturity variable, indicating the sustainability of financial decisions;  $\beta INDVAR_{i,t}$ : includes a set of independent variables reflecting the personal attributes of the CFO;  $\gamma Controls_{i,t}$ : comprises firm-level and macro-level control variables;  $\mu_i$ : denotes the unobserved individual effect; and  $\varepsilon_{i,t}$ : refers to a random error term.

This model controls for inherent firm heterogeneity and omitted variable bias while leveraging dynamic information in panel data. Table 1 reflects the definitions of the variables in the model.

**Table 1. Definition of variables in the model**

| Variable                  | Symbol | Definition   | Related research |
|---------------------------|--------|--|------------------|
| Long-term Debt Ratio      | LTDR   | The long-term debt ratio to the company's total debt   | [4, 5, 26]       |
| Weighted Average Maturity | WAM    | The ratio of short-term and long-term debt to the company's total debt                             | [28-30]          |
| CFO Gender                | CFOGEN | Dummy variable = 1 if the CFO is female, otherwise = 0   | [13, 14, 32]     |
| CFO Age                   | CFOAGE | The age of the CFO is measured in actual years   | [32, 32]         |
| CFO Education             | CFODEG | Dummy variable = 1 if the CFO holds a master's degree or higher, otherwise = 0                     | [22, 33, 34]     |
| CFO Financial Experience  | CFOFIN | Dummy variable = 1 if the CFO has financial expertise; otherwise = 0                               | [24, 35, 36]     |
| Firm size                 | FSIZE  | Natural logarithm of Total Assets  | [5, 28]          |
| Leverage ratio            | LEV    | Total Debt/Total Assets  | [37]             |
| Fixed Assets ratio        | FIXR   | Natural logarithm of (Fixed Assets/Total Assets)   | [37, 38]         |
| Firm Growth Rate          | AGROW  | (Total Assets in year, - Total Assets in year <sub>t-1</sub> )/Total Assets in year <sub>t-1</sub> | [30, 39]         |
| Return on Assets          | ROA    | Net Income/Total Assets  | [38, 41]         |
| Real Interest Rate        | RIR    | Annual Real Interest Rate  | [42, 43]         |
| Inflation rate            | INF    | Annual Inflation rate  | [42, 43]         |
| GDP growth                | GDP    | Annual GDP growth rate   | [43]             |

## 4- Results and Discussion

### 4-1- Descriptive Statistics and Correlation Analysis

The dataset used in this study includes 312 non-financial companies officially listed on the Vietnam Stock Exchange, spanning nine distinct sectors based on GICS® - Global Industry Classification Standards. When categorised by sector, this study focuses on three main sectors: industrials (78 companies), materials (56 companies), and consumer staples (30 companies).

Table 2 presents descriptive statistics results of the variables within the model. The research sample includes 4,056 observations from 2011 to 2023, covering 312 non-financial firms. Regarding the dependent variable, LTDR (long-term debt to total debt ratio) averages 0.177, with a standard deviation of 0.230, ranging from 0 to 0.97. This indicates that long-term debt comprises only a small portion of the total debt for listed non-financial companies in Vietnam, suggesting that most Vietnamese firms prefer to rely on short-term debt. Conversely, the weighted average debt maturity (WAM) is 2,528 days but shows high variability (standard deviation 4,980; minimum = 1; maximum around 138,921), reflecting notable differences in debt maturity structures across firms.

**Table 2. Descriptive Statistics**

| Variable | Obs  | Mean      | Std. Dev. | Min       | Max       |
|----------|------|-----------|-----------|-----------|-----------|
| LTDR     | 4056 | 0.17716   | 0.229531  | 0         | 0.971325  |
| WAM      | 4056 | 2.527942  | 4.98049   | 1         | 138.92135 |
| CFOGEN   | 4056 | 0.533284  | 0.498952  | 0         | 1         |
| CFOAGE   | 4055 | 42.794081 | 7.415584  | 23        | 75        |
| CFODEG   | 4056 | 0.114152  | 0.318035  | 0         | 1         |
| CFOFIN   | 4056 | 0.883136  | 0.321298  | 0         | 1         |
| FSIZE    | 4056 | 11.868286 | 0.679201  | 10.132247 | 14.824553 |
| LEV      | 4056 | 0.484371  | 0.219378  | 0.002674  | 1.294471  |
| FIXR     | 4056 | 0.230132  | 0.201827  | 6.00E-06  | 0.96975   |
| AGROW    | 4053 | 0.108709  | 0.583383  | -0.841639 | 21.193223 |
| ROA      | 4056 | 0.062675  | 0.086683  | -1.587402 | 0.7837    |
| RIR      | 4056 | 0.045081  | 0.028525  | -0.036733 | 0.089883  |
| INF      | 4056 | 0.048515  | 0.04475   | 0.006312  | 0.186777  |
| GDP      | 4056 | 0.059942  | 0.016232  | 0.025537  | 0.081235  |

Regarding CFO characteristics, over half of the CFOs in the sample are female (CFOGEN = 533), indicating that the CFO profession is quite accessible to women. The average age of CFOs is 42.794 years, ranging from 23 to 75 years, highlighting age diversity in financial management. About 11.4% of CFOs hold postgraduate degrees (CFODEG), and 88.3% have a background in finance (CFOFIN), emphasizing the importance of financial expertise in CFO recruitment within Vietnamese listed firms. This also illustrates that Vietnam's financial management landscape differs significantly from developed markets, with a trend towards specialization and academization of the CFO role in emerging markets, fostering conditions for CFOs to serve as innovative agents in strategic financial decision-making.

The control variables provide further insights. Firm size (FSIZE) has an average of approximately 11.868 (log assets), while financial leverage (LEV) stands at 0.484, suggesting a relatively high utilization of debt, roughly 50% of total assets. The average asset growth rate (AGROW) is 0.109, with considerable variation (minimum = -0.841; maximum = 21.193), indicating that some firms have experienced significant growth. The fixed asset ratio (FIXR) is only 0.230, signifying that Vietnamese firms possess limited tangible assets for collateral purposes. The average return on assets (ROA) is 0.063, which is relatively low compared to international standards. Some firms even show negative values of -1.587, highlighting the financial risks in the emerging market context. Regarding macroeconomic factors, real interest rates (RIR), inflation (INF), and GDP growth (GDP) all record low averages, consistent with characteristics typical of emerging economies and Vietnam's economic situation from 2011 to 2023.

Overall, the descriptive statistics demonstrate that Vietnamese firms' debt maturity structure is characterized by a high ratio of short-term debt, wide variation in WAM, and a predominance of CFOs with financial expertise. This suggests that CFO traits may notably influence differences in debt maturity decisions across firms and sectors.

Table 3 presents the Pearson correlation matrix among the research variables. The findings reveal that most correlation coefficients are small, mainly between -0.12 and 0.40, indicating weak to moderate linear relationships. However, some notable points emerge. Firstly, the correlation coefficient between LTDR and WAM reaches 0.593 ( $p < 0.01$ ), indicating a relatively strong positive relationship. This suggests that firms with higher long-term debt ratios tend to have longer average debt maturities, aligning with theoretical expectations. Additionally, some other pairs of control variables also show moderate correlations, such as FSIZE with LTDR ( $r = 0.354$ ,  $p < 0.01$ ) and FIXR with WAM ( $r = 0.402$ ,  $p < 0.01$ ). Secondly, the correlations among CFO characteristic variables (gender, age, education, and expertise) are generally very low, mostly below 0.10. This indicates that multicollinearity among leadership variables is minimal, allowing these variables to be used simultaneously in the model without compromising the reliability of the estimates. Third, macro variables display higher correlations. Notably, the correlation between inflation (INF) and real interest rate (RIR) is -0.826 ( $p < 0.01$ ), reflecting a strong inverse relationship. This signals potential multicollinearity when both are included in the same regression model. Other macro variables, such as GDP with INF ( $r = 0.029$ ,  $p < 0.11$ ) or GDP with RIR ( $r = -0.187$ ,  $p < 0.01$ ), have lower correlations, which are not a significant concern.

**Table 3. Matrix of correlations**

| Variables  | (1)       | (2)       | (3)       | (4)       | (5)      | (6)       | (7)       | (8)       | (9)       | (10)     | (11)      | (12)      | (13)     | (14) |
|------------|-----------|-----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|----------|-----------|-----------|----------|------|
| (1) LTDR   | 1         |           |           |           |          |           |           |           |           |          |           |           |          |      |
| (2) WAM    | 0.593***  | 1         |           |           |          |           |           |           |           |          |           |           |          |      |
| (3) CFOGEN | -0.011    | -0.054*** | 1         |           |          |           |           |           |           |          |           |           |          |      |
| (4) CFOAGE | -0.058*** | -0.019    | -0.028*   | 1         |          |           |           |           |           |          |           |           |          |      |
| (5) CFODEG | 0.016     | 0.008     | -0.107*** | -0.053*** | 1        |           |           |           |           |          |           |           |          |      |
| (6) CFOFIN | 0.016     | 0.029*    | -0.023    | -0.033**  | 0.063*** | 1         |           |           |           |          |           |           |          |      |
| (7) FSIZE  | 0.354***  | 0.194***  | -0.051*** | -0.102*** | 0.162*** | 0.034**   | 1         |           |           |          |           |           |          |      |
| (8) LEV    | 0.200***  | 0.136***  | -0.093*** | -0.124*** | 0.065*** | -0.017    | 0.307***  | 1         |           |          |           |           |          |      |
| (9) FIXR   | 0.406***  | 0.402***  | -0.019    | 0.039**   | -0.034** | -0.019    | 0.047***  | -0.037**  | 1         |          |           |           |          |      |
| (10) AGROW | 0.057***  | 0.022     | 0.032**   | -0.039**  | -0.006   | -0.01     | 0.067***  | 0.050***  | -0.036**  | 1        |           |           |          |      |
| (11) ROA   | -0.124*** | -0.078*** | -0.028*   | 0.110***  | -0.01    | 0.018     | -0.057*** | -0.412*** | 0.01      | 0.056*** | 1         |           |          |      |
| (12) RIR   | -0.014    | -0.016    | 0.011     | 0.058***  | 0.021    | 0.083***  | 0.055***  | -0.037**  | -0.061*** | -0.035** | -0.060*** | 1         |          |      |
| (13) INF   | 0.015     | 0.022     | -0.023    | -0.095*** | -0.017   | -0.089*** | -0.108*** | 0.051***  | 0.103***  | 0.006    | 0.052***  | -0.826*** | 1        |      |
| (14) GDP   | 0.014     | 0.005     | -0.007    | -0.026*   | -0.022   | -0.026*   | -0.028*   | 0.009     | 0.005     | 0.029*   | 0.028*    | -0.187*** | 0.046*** | 1    |

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

In conclusion, the correlation analysis indicates: (i) The close relationship between LTDR and WAM warrants attention when constructing the model, as including both may cause multicollinearity; (ii) CFO characteristics have minimal linear correlation with each other and with financial variables, reducing the risk of multicollinearity; (iii) macro variables, particularly INF and RIR, exhibit very high correlations and may lead to multicollinearity issues.

#### 4-2- Reliability Testing and Selection of the Estimation Model

Before conducting the estimation, the study performed a series of tests to ensure the model's reliability. First, multicollinearity was evaluated using the VIF coefficient. Results show that all independent variables had VIFs below 4, with the highest VIF associated with INF and RIR (3.41). Other variables have VIFs ranging from 1.02 to 1.38; the average VIF is only 1.49. Thus, the VIF remained within acceptable limits, and severe multicollinearity was not a concern. Next, tests for heteroscedasticity (Breusch-Pagan, White test) and autocorrelation (Wooldridge test) indicated the presence of heteroscedasticity and autocorrelation in the model. This suggests the need for robust standard errors or more efficient estimation techniques. The study employed Pooled OLS, FEM (Fixed Effects Model), REM (Random Effects Model), and the Hausman test for model selection. For LTDR, the Hausman test results indicated that REM is more appropriate than FEM, and the Hansen test confirmed the validity of the instrument. Therefore, the discussion related to LTDR mainly relies on REM estimation, while OLS and FEM are used for comparison. Conversely, for WAM, the Hausman test results show FEM as more suitable than REM, and the Hansen test also affirms the instrument's validity. Hence, FEM is used as the main model for discussion, with OLS and REM used for comparison.

Additionally, the study estimates that FGLS can address potential heteroscedasticity and autocorrelation. The FGLS results demonstrate that the signs and statistical significance levels of the explanatory variables are generally consistent with REM (for LTDR) and FEM (for WAM), thereby reinforcing the robustness of the conclusions. However, due to potential endogeneity in panel data, the study also utilized a dynamic GMM model (Arellano-Bond/Arellano-Bover/Blundell-Bond) to address endogeneity and overcome limitations of traditional models.

#### 4-3- Discuss the Research Results

Tables 4 and 5 present the estimation results using the GMM and GMM-Robust methods for the dependent variables LTDR and WAM, respectively. These are the study's main findings because GMM effectively handles the endogeneity issue between variables and captures dynamic effects through the lagged dependent variable. Generally, the coefficients align with expectations, and many variables are statistically significant at the 1%, 5%, and 10% levels.

##### 4-3-1- CFO Gender

The CFOGEN variable is positive for LTDR and WAM but not statistically significant for the entire sample. This finding indicates that female CFOs tend to employ higher proportions of long-term debt and longer debt maturities, aligning with hypotheses  $H_{1a}$  and  $H_{1b}$ . Still, there is insufficient evidence to confirm the relationship at the market level. It also partially supports the argument that female leaders are more financially cautious because they prefer stable sources of capital to reduce long-term liquidity risk. This outcome corroborates previous studies [8, 13, 14], identifying a relationship between female gender and financial decision-making behavior. The results may reflect cross-industry differences and limitations in statistical power. In the Consumer Staples sector, characterized by high stability and minimal fluctuations in economic cycles, product demand remains nearly steady, and the coefficient is positive and

significant for debt maturity (measured through two indices, LTDR and WAM). Conversely, the Materials sector is highly volatile due to reliance on global commodity prices (steel, cement, chemicals, etc.), with an industry cycle tied to the economic cycle; here, the coefficient is negative and significant for LTDR. This evidence suggests a contextual effect: female CFOs in highly volatile industries may be more cautious about long-term debt commitments, favoring short-term borrowing to retain financial flexibility. These findings substantiate previous research on gender's influence on financial decision-making [44, 45].

#### 4-3-2- CFO Age

Across the entire sample, CFOAGE is negative and statistically significant with LTDR, so hypothesis H<sub>2a</sub> is accepted. Meanwhile, CFOAGE is positive with WAM, aligning with hypothesis H<sub>2b</sub>, but not strong enough to confirm due to a lack of statistical significance. The results suggest that older CFOs are more cautious with long-term debt and tend to extend the maturity of their debt portfolios. The effect is more pronounced in the industrial sector, where high refinancing risk highlights the experience of older CFOs, who are more likely to reduce the use of long-term debt.

**Table 4. GMM and GMM-Robust regression results for debt maturity, measured by the LTDR variable**

| Variable           | All samples |            | Industrial |            | Materials |            | Staples   |            |
|--------------------|-------------|------------|------------|------------|-----------|------------|-----------|------------|
|                    | GMM         | GMM-Robust | GMM        | GMM-Robust | GMM       | GMM-Robust | GMM       | GMM-Robust |
| L.LTDR             | 0.719***    | 0.719***   | 0.443***   | 0.443***   | 0.767***  | 0.767***   | 0.517***  | 0.517***   |
|                    | 0           | 0          | -0.001     | -0.001     | 0         | 0          | 0         | 0          |
| CFOGEN             | 0.003       | 0.003      | 0.011      | 0.011      | -0.017**  | -0.017**   | 0.023**   | 0.023*     |
|                    | -0.604      | -0.61      | -0.439     | -0.446     | -0.034    | -0.032     | -0.043    | -0.09      |
| CFOAGE             | -0.000*     | -0.000*    | -0.001*    | -0.001     | 0         | 0          | 0         | 0          |
|                    | -0.089      | -0.091     | -0.097     | -0.105     | -0.242    | -0.268     | -0.838    | -0.861     |
| CFODEG             | -0.007      | -0.007     | -0.021*    | -0.021*    | -0.006    | -0.006     | 0.015     | 0.015      |
|                    | -0.243      | -0.251     | -0.073     | -0.073     | -0.281    | -0.26      | -0.412    | -0.445     |
| CFOFIN             | 0.016***    | 0.016**    | 0.005      | 0.005      | -0.008    | -0.008     | 0.033*    | 0.033      |
|                    | -0.01       | -0.01      | -0.607     | -0.614     | -0.543    | -0.552     | -0.086    | -0.188     |
| FSIZE              | 0.026***    | 0.026***   | 0.068***   | 0.068***   | 0.021**   | 0.021**    | 0.046***  | 0.046***   |
|                    | 0           | 0          | -0.005     | -0.003     | -0.033    | -0.044     | 0         | -0.002     |
| LEV                | 0.025       | 0.025      | 0.070*     | 0.070*     | -0.005    | -0.005     | -0.004    | -0.004     |
|                    | -0.113      | -0.119     | -0.052     | -0.06      | -0.857    | -0.873     | -0.924    | -0.942     |
| FIXR               | 0.129***    | 0.129***   | 0.386***   | 0.386***   | 0.041     | 0.041      | 0.063     | 0.063      |
|                    | 0           | 0          | 0          | 0          | -0.201    | -0.222     | -0.163    | -0.285     |
| AGROW              | 0.019**     | 0.019**    | 0.009      | 0.009      | 0.034     | 0.034      | 0.035     | 0.035      |
|                    | -0.043      | -0.045     | -0.368     | -0.363     | -0.26     | -0.249     | -0.393    | -0.483     |
| ROA                | -0.095***   | -0.095***  | -0.083     | -0.083     | -0.107**  | -0.107*    | -0.165**  | -0.165**   |
|                    | 0           | 0          | -0.146     | -0.156     | -0.045    | -0.052     | -0.011    | -0.042     |
| RIR                | 0.069       | 0.069      | 0.116      | 0.116      | 0.038     | 0.038      | 0.199     | 0.199      |
|                    | -0.553      | -0.557     | -0.595     | -0.601     | -0.78     | -0.788     | -0.424    | -0.487     |
| INF                | -0.215**    | -0.215**   | -0.583***  | -0.583***  | -0.392**  | -0.392**   | -0.316*   | -0.316*    |
|                    | -0.017      | -0.017     | -0.001     | -0.001     | -0.013    | -0.015     | -0.058    | -0.097     |
| GDP                | -0.046      | -0.046     | 0.196      | 0.196      | -0.065    | -0.065     | -0.351*   | -0.351     |
|                    | -0.672      | -0.676     | -0.291     | -0.297     | -0.618    | -0.636     | -0.082    | -0.102     |
| Constant           | -0.290***   | -0.290***  | -0.756***  | -0.756***  | -0.175    | -0.175     | -0.533*** | -0.533***  |
|                    | -0.001      | -0.001     | -0.006     | -0.005     | -0.125    | -0.16      | 0         | -0.001     |
| No. of instruments | 16          | 16         | 16         | 16         | 16        | 16         | 18        | 18         |
| No. of groups      | 312         | 312        | 78         | 78         | 56        | 56         | 30        | 30         |
| AR(1)              | 0.000       | 0.000      | 0.005      | 0.005      | 0.003     | 0.003      | 0.016     | 0.017      |
| AR(2)              | 0.524       | 0.524      | 0.290      | 0.290      | 0.587     | 0.587      | 0.765     | 0.646      |
| Hansen of overid.  | 0.367       | 0.367      | 0.525      | 0.525      | 0.612     | 0.612      | 0.486     | 0.486      |

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

**Table 5. GMM and GMM-Robust regression results for debt maturity, measured by the WAM variable**

| Variable           | All samples |            | Industrial |            | Materials |            | Staples   |            |
|--------------------|-------------|------------|------------|------------|-----------|------------|-----------|------------|
|                    | GMM         | GMM-Robust | GMM        | GMM-Robust | GMM       | GMM-Robust | GMM       | GMM-Robust |
| L.WAM              | 0.223***    | 0.223***   | -0.621***  | -0.818***  | 0.711***  | 0.711***   | 0.639***  | 0.639***   |
|                    | 0           | -0.001     | 0          | 0          | 0         | 0          | 0         | 0          |
| CFOGEN             | 0.14        | 0.14       | 0.109      | 0.178      | -0.064    | -0.064     | 0.195**   | 0.195*     |
|                    | -0.514      | -0.513     | -0.876     | -0.829     | -0.106    | -0.132     | -0.013    | -0.086     |
| CFOAGE             | 0.017       | 0.017      | 0.013      | 0.01       | -0.003    | -0.003     | 0.004     | 0.004      |
|                    | -0.29       | -0.31      | -0.973     | -0.879     | -0.203    | -0.226     | -0.419    | -0.48      |
| CFODEG             | 0.22        | 0.22       | -0.023     | -0.097     | -0.022    | -0.022     | 0.14      | 0.14       |
|                    | -0.473      | -0.478     | -0.984     | -0.944     | -0.686    | -0.673     | -0.305    | -0.594     |
| CFOFIN             | 0.750**     | 0.750**    | 0.531      | 0.379      | 0.014     | 0.014      | 0.425***  | 0.425*     |
|                    | -0.023      | -0.03      | -0.69      | -0.786     | -0.776    | -0.8       | -0.005    | -0.086     |
| FSIZE              | 1.182***    | 1.182***   | 3.295***   | 3.631***   | 0.103***  | 0.103**    | 0.170***  | 0.17       |
|                    | 0           | 0          | -0.003     | -0.001     | -0.002    | -0.016     | -0.008    | -0.109     |
| LEV                | 0.811       | 0.811      | 1.658      | 1.663      | 0.192     | 0.192      | 0.152     | 0.152      |
|                    | -0.136      | -0.136     | -0.415     | -0.494     | -0.286    | -0.323     | -0.496    | -0.608     |
| FIXR               | 5.365***    | 5.365***   | 16.234***  | 17.247***  | 0.264     | 0.264      | -0.148    | -0.148     |
|                    | 0           | 0          | 0          | 0          | -0.178    | -0.243     | -0.67     | -0.789     |
| AGROW              | 0.142       | 0.142      | 0.065      | 0.078      | 0.34      | 0.34       | 0.582**   | 0.582*     |
|                    | -0.255      | -0.258     | -0.702     | -0.717     | -0.12     | -0.148     | -0.023    | -0.06      |
| ROA                | -2.483*     | -2.483*    | -5.825*    | -7.023*    | -0.716**  | -0.716*    | -0.728*** | -0.728**   |
|                    | -0.094      | -0.095     | -0.06      | -0.076     | -0.045    | -0.063     | -0.004    | -0.03      |
| RIR                | 97.890*     | 97.890*    | 84.247***  | 110.263*** | -1.636    | -1.636     | 0.777     | 0.777      |
|                    | -0.07       | -0.085     | 0          | -0.009     | -0.249    | -0.28      | -0.573    | -0.643     |
| INF                | 44.585      | 44.585     | 35.888**   | 52.131**   | -3.035*** | -3.035***  | -1.254    | -1.254     |
|                    | -0.106      | -0.124     | -0.022     | -0.011     | -0.005    | -0.008     | -0.143    | -0.24      |
| GDP                | 286.522*    | 286.522*   | 230.118*** | 308.005**  | -0.606    | -0.606     | -1.699*   | -1.699     |
|                    | -0.08       | -0.096     | 0          | -0.015     | -0.383    | -0.437     | -0.06     | -0.21      |
| Constant           | -39.009**   | -39.009**  | -58.850**  | -68.919*** | -0.556    | -0.556     | -2.170*** | -2.17      |
|                    | -0.022      | -0.03      | -0.037     | -0.001     | -0.147    | -0.26      | -0.006    | -0.113     |
| No. of instruments | 15          | 15         | 16         | 18         | 20        | 20         | 21        | 21         |
| No. of groups      | 312         | 312        | 78         | 78         | 56        | 56         | 30        | 30         |
| AR(1)              | 0.026       | 0.031      | 0.002      | 0.005      | 0.005     | 0.008      | 0.014     | 0.016      |
| AR(2)              | 0.110       | 0.129      | 0.052      | 0.065      | 0.340     | 0.341      | 0.833     | 0.833      |
| Hansen of overid.  | 0.419       | 0.419      | 0.628      | 0.817      | 0.804     | 0.804      | 0.493     | 0.493      |

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

This finding implies that older CFOs are generally more cautious about increasing long-term debt and prefer to manage their debt structure to "stabilize" debt maturity. Such behavior may stem from accumulated experience and increased caution, with older CFOs prioritizing risk management over debt expansion. This aligns with the evidence [10] and [9] provided. It is similar to Serfling's findings [46] regarding how leadership age influences financial policy.

#### 4-3-3- CFOs' Education

The variable CFODEG shows a negative correlation with LTDR and a positive correlation with WAM, but these are not statistically significant across the sample. This supports the idea that higher education improves the term structure (reducing dependence on long-term debt and increasing WAM). However, the evidence is insufficient to confirm hypotheses H<sub>3a</sub> and H<sub>3b</sub>. This partly aligns with [23], who found that using cost management systems for decision-making, control, and performance evaluation has a significant positive link with CFO education.

In the Industrial sector, the coefficient is significant and negatively correlated with the long-term debt ratio (LTDR), suggesting that analytical skills are more effective when projects are capital-intensive. This indicates that in industries

involving substantial fixed investment risk or highly affected by market volatility, CFOs with higher education levels tend to possess better financial analysis skills and a deeper understanding of market dynamics. Consequently, they are more likely to optimize their company's debt structure by focusing on short-term debt, which helps lower financing costs and retain flexibility in capital management.

#### 4-3-4- CFO Financial Expertise

Across the sample, CFOFIN is positively associated with LTDR and WAM and is statistically significant at the 5% level. The findings suggest that a financial background helps CFOs increase access to long-term financing and extend WAM, supporting hypotheses H<sub>4a</sub> and H<sub>4b</sub>. The effect is more pronounced in the Consumer Staples industry, where stable cash flows enable 'locking in' long-term debt. This agrees with [15], who found that firms with accounting CFOs in low-growth industries are more cost-efficient. This indicates that CFOs with greater financial expertise tend to prefer long-term debt. They are more aware of refinancing risks and the long-term implications of capital structure choices. As a result, they may take a more cautious approach by lengthening debt maturities to enhance financial stability and lessen short-term liquidity pressures.

#### 4-3-5- Discuss the Control Variables

The results of the control variable analysis generally support key ideas in classical capital theories. Specifically, the positive and significant effect of firm size on LTDR and WAM across the entire sample and all industries backs the trade-off theory [47], which states that larger firms have easier access to long-term financing because they are more creditworthy and face lower bankruptcy risks. Likewise, the positive and significant impact of the fixed asset ratio on both LTDR and WAM reflects the pecking order theory [48], where tangible assets serve as collateral, boosting the ability to borrow long-term debt. The pecking order theory [48] also aligns with an inverse relationship between ROA, LTDR, and WAM, meaning highly profitable firms rely less on debt because they can finance themselves internally. In contrast, asset growth's mostly positive (though often statistically insignificant) impact supports Market Timing Theory [49], which suggests that fast-growing firms take advantage of favorable market conditions to secure long-term funding. Regarding macroeconomic factors, the results show that real interest rates positively influence WAM (significant in some sectors), indicating that firms tend to extend their debt maturities to reduce refinancing risk during high-interest periods. Conversely, inflation negatively affects LTDR, aligning with the trade-off theory [47], which argues that higher credit risk limits firms' ability to expand long-term borrowing during inflation. GDP growth alone positively impacts WAM, implying that firms find it easier to access long-term loans during periods of economic growth.

In summary, while this study mainly relies on Upper Echelons Theory [12] and the Theory of Liquidity Risk, Liquidity Creation, and Financial Fragility [18], comparing control variables with classical capital theories strengthens the validity and reliability of the findings. It also emphasizes the link between top management characteristics and the factors influencing firms' debt structures.

The results reveal that CFOs are financial players and strategic innovators in shaping debt maturity profiles. This expands the application of the Upper Echelons Theory into corporate finance, especially within emerging markets. Figures 2 and 3 illustrate the influence of factors on debt maturity, as shown by long-term debt measures and average debt maturity.

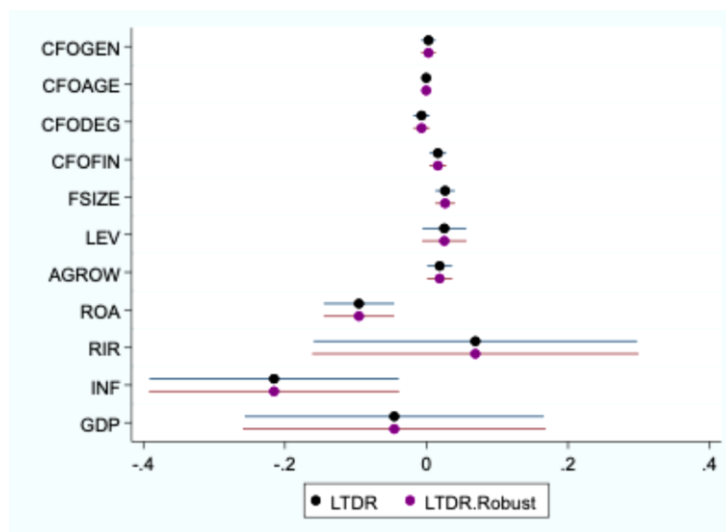


Figure 2. Impact of factors on debt maturity (measured by LTDR)

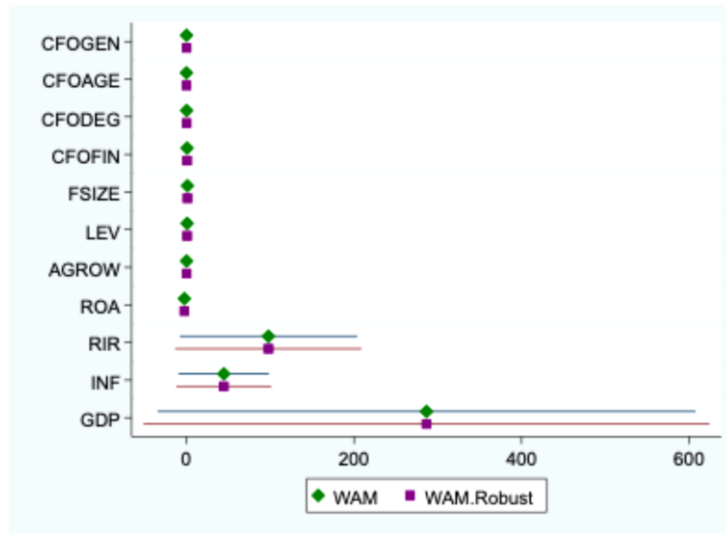


Figure 3. Impact of factors on debt maturity (measured by WAM)

#### 4-4-Robustness Tests

To verify the robustness of the impact of CFO characteristics on debt maturity, in addition to using alternative estimates such as OLS, FEM, REM, and FGLS (see Table 6), the study selected three representative industries out of nine listed industries, including Industrials, Materials, and Consumer Staples. The results confirm that the signs and statistical significance of the main variables (CFOAGE, CFOFIN, FSIZE, FIXR, ROA) are generally consistent, although the significance levels differ. For LTDR (Table 4), the coefficient of the lagged dependent variable (L.LTDR) is positive and highly significant, indicating that the long-term debt structure remains sustainable over time. CFO age (CFOAGE) shows a negative coefficient among the CFO characteristic variables. It is significant at the 10% level, suggesting that older CFOs tend to lower their long-term debt ratio, aligning with hypothesis H2a. Finance background (CFOFIN) has a positive and significant coefficient, implying that CFOs with a finance background favor long-term debt (supporting H4a). Conversely, gender (CFOGEN) and education level (CFOEDU) are insignificant in the full model and display industry-specific variations: female CFOs are more likely to choose higher long-term debt ratios in the Consumer Staples industry, whereas in the Materials industry, the relationship appears inverse.

Control variables such as firm size (FSIZE) and fixed asset ratio (FIXR) have positive and significant effects, indicating that larger, more asset-secured firms tend to access long-term debt more easily. Conversely, profitability (ROA) and inflation (INF) exert negative effects, suggesting that highly efficient firms or those operating in inflationary environments tend to reduce their long-term debt use. For WAM (Table 5), the coefficient of the lagged dependent variable (L. WAM) is positive and significant, confirming the dynamic aspect of debt maturity. Among the CFO characteristics, financial background (CFOFIN) has a positive, considerable coefficient at the 5% level, indicating that CFOs with financial expertise prefer longer debt maturities, supporting hypothesis H4b. Similarly, female CFOs (CFOGEN) show a positive, significant effect within the Consumer Staples industry, endorsing hypothesis H1b in a stable industry context. In contrast, CFO age (CFOAGE) and education level (CFOEDU) are inconsistent across the sample but demonstrate more pronounced differences in the Materials industry.

Regarding control variables, firm size (FSIZE) and fixed asset ratio (FIXR) have positive and strong effects, while profitability (ROA) has a negative impact. This indicates that larger, asset-intensive firms tend to maintain longer maturities. Conversely, more profitable firms have less need for extended debt maturities.

Table 6 also shows that, in most models, older CFOs are associated with lower LTDR; CFOs with financial expertise have higher LTDR and WAM, while FSIZE and FIXR continue to have a positive effect. This supports the view that the GMM findings are robust and not overly dependent on a particular estimation technique. In conclusion, the main regression results and robustness tests affirm the influence of CFO personality traits on corporate debt structure, emphasizing that this effect is industry-specific and shaped by macroeconomic factors.

**Table 6. OLS, FEM, REM and FGLS regression results with dependent variables LTDR and WAM**

| VARIABLES         | LTDR      |           |           |           | WAM        |            |            |           |
|-------------------|-----------|-----------|-----------|-----------|------------|------------|------------|-----------|
|                   | OLS       | FEM       | REM       | FGLS      | OLS        | FEM        | REM        | FGLS      |
| CFOGEN            | 0.006     | -0.004    | -0.003    | -0.002    | -0.336**   | -0.03      | -0.066     | -0.001    |
|                   | -0.3      | -0.473    | -0.618    | -0.485    | -0.018     | -0.849     | -0.664     | -0.985    |
| CFOAGE            | -0.001    | -0.001*** | -0.001*** | -0.000*   | -0.003     | 0.004      | 0.003      | 0         |
|                   | -0.126    | -0.003    | -0.004    | -0.081    | -0.757     | -0.714     | -0.769     | -0.805    |
| CFODEG            | -0.019*   | -0.01     | -0.011    | -0.003    | -0.22      | -0.331     | -0.323     | -0.041    |
|                   | -0.054    | -0.214    | -0.161    | -0.478    | -0.328     | -0.123     | -0.122     | -0.36     |
| CFOFIN            | 0.013     | 0.006     | 0.007     | 0.002     | 0.533**    | 0.172      | 0.201      | 0.019     |
|                   | -0.166    | -0.401    | -0.374    | -0.617    | -0.015     | -0.377     | -0.291     | -0.558    |
| FSIZE             | 0.103***  | 0.104***  | 0.104***  | 0.071***  | 1.045***   | 1.271***   | 1.245***   | 0.380***  |
|                   | 0         | 0         | 0         | 0         | 0          | 0          | 0          | 0         |
| LEV               | 0.091***  | 0.148***  | 0.138***  | 0.032***  | 1.998***   | 2.569***   | 2.379***   | 0.416***  |
|                   | 0         | 0         | 0         | -0.002    | 0          | 0          | 0          | 0         |
| FIXR              | 0.451***  | 0.325***  | 0.345***  | 0.301***  | 9.875***   | 4.625***   | 5.763***   | 2.283***  |
|                   | 0         | 0         | 0         | 0         | 0          | 0          | 0          | 0         |
| AGROW             | 0.020***  | 0.014***  | 0.014***  | 0         | 0.219*     | 0.024      | 0.046      | -0.01     |
|                   | 0         | 0         | 0         | -0.893    | -0.07      | -0.771     | -0.578     | -0.681    |
| ROA               | -0.202*** | -0.176*** | -0.173*** | -0.028**  | -2.292**   | -1.909**   | -1.732**   | -0.098    |
|                   | 0         | 0         | 0         | -0.033    | -0.011     | -0.018     | -0.028     | -0.5      |
| RIR               | 0.046     | 0.087     | 0.08      | 0.016     | -1.228     | 2.515      | 1.828      | 0.258     |
|                   | -0.816    | -0.456    | -0.492    | -0.751    | -0.786     | -0.412     | -0.547     | -0.576    |
| INF               | 0.05      | 0.105     | 0.094     | 0.109**   | -1.148     | 3.361      | 2.454      | 1.167***  |
|                   | -0.687    | -0.19     | -0.229    | -0.014    | -0.691     | -0.108     | -0.226     | -0.004    |
| GDP               | 0.285     | 0.288**   | 0.286**   | 0.038     | 1.868      | 3.097      | 2.858      | 0.017     |
|                   | -0.142    | -0.011    | -0.011    | -0.378    | -0.676     | -0.296     | -0.334     | -0.966    |
| Constant          | -1.189*** | -1.175*** | -1.173*** | -0.808*** | -13.136*** | -15.469*** | -15.219*** | -3.804*** |
|                   | 0         | 0         | 0         | 0         | 0          | 0          | 0          | 0         |
| Observations      | 4,052     | 4,052     | 4,052     | 4,052     | 4,052      | 4,052      | 4,052      | 4,052     |
| R-squared         | 0.3       | 0.158     | -         | -         | 0.207      | 0.052      | -          | -         |
| Number of firm_id | -         | 312       | 312       | 312       | -          | 312        | 312        | 312       |

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## 5- Conclusions and Policy Implications

This study explores how CFO personal traits affect corporate debt maturity, measured by the long-term debt ratio (LTDR) and weighted average debt maturity (WAM). It uses a solid balanced panel dataset of 312 non-financial listed companies in Vietnam from 2011 to 2023. Using robust estimation methods such as OLS, FEM, REM, FGLS, and GMM, the findings reveal that CFO characteristics do influence debt maturity structures. However, the impacts differ both statistically and across industries. Regarding gender, female CFOs tend to be associated with higher LTDR and WAM, especially in the Consumer Staples sector. This supports the Upper Echelons Theory, which states that personal traits influence financial choices. Concerning age, older CFOs are more cautious about LTDR and prefer longer WAM, particularly in volatile sectors like Industrials, where refinancing risk is greater. Results related to CFO education match expectations: highly educated CFOs are more likely to lower LTDR and extend WAM, particularly in the Industrials sector, highlighting the importance of analytical skills for capital-intensive projects. Additionally, CFO financial expertise is positively associated with LTDR and WAM, a trend observed across stable industries, reflecting their ability to leverage expertise to manage liquidity risk.

The findings have several key implications. Theoretically, this study advances the existing literature in three main ways. First, viewing the CFO as an innovator in debt maturity decisions broadens the Upper Echelons Theory to include the CFO's role in shaping financial strategies, rather than just implementing them. Second, it clarifies that financial management innovation is not limited to investment or R&D decisions but also influences debt structure - an area that

has received little attention previously. Third, by including industry heterogeneity in the model, it supports the contextualized perspective of upper echelons theory, showing that leadership traits affect innovation outcomes only when they interact with specific industry structures.

Methodologically, using panel data from over a decade of listed companies in emerging markets enhances the reliability and applicability of the results. Meanwhile, applying diverse estimation techniques - ranging from OLS, FEM, REM, FGLS to dynamic GMM-Nonrobust and dynamic GMM-Robust - boosts the robustness of the findings. It enriches the analysis of managerial financial behavior. Furthermore, considering industry heterogeneity offers a comprehensive empirical approach that addresses the limitations of many previous studies, which treat the market as uniform.

Concerning societal implications, the findings go beyond the corporate level. CFOs acting as innovators in debt maturity decisions directly influence firms' financial risk structures, thereby contributing to the stability of capital markets in emerging economies. At the societal level, promoting diversity in leadership attributes - such as gender, age, and educational background - can foster more prudent financial decision-making, thereby reducing contagion risk in the economy. This is especially important for emerging countries, where the financial system remains vulnerable to macroeconomic shocks and lacks transparency.

However, the study has certain limitations. First, the data is limited to listed companies in Vietnam, restricting the ability to generalize the results. Second, the research focuses on four main CFO traits, while behavioral factors such as risk tolerance or leadership style are not considered. Third, industry volatility is only assessed at an aggregate level; further studies are needed to examine specific industries in greater detail. Future studies could expand internationally, incorporate behavioral variables, and explore different institutional settings to better understand the CFO's role as an innovation driver in corporate debt management.

## 6- Declarations

### 6-1-Data Availability Statement

The data supporting this study's findings are publicly available from the State Securities Commission of Vietnam, the Hanoi and Ho Chi Minh Stock Exchanges, and the World Bank [25, 50, 51, 52]. Therefore, no proprietary or confidential data is shared

### 6-2-Funding

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### 6-3-Institutional Review Board Statement

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### 6-4-Informed Consent Statement

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### 6-5-Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this manuscript. In addition, the ethical issues, including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, and redundancies have been completely observed by the author.

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