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Debt-to-Assets Ratio and Earnings Per Share: Evidence from Listed Construction Firms

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Abstract

This study looks at the relationship between profits per share (EPS) and the debt-to-assets ratio (DAR) for construction companies that are listed on the Hanoi Stock Exchange in Vietnam. The study uses pooled ordinary least squares (OLS), fixed-effects, random-effects, and generalized least squares (GLS) estimators to evaluate the connection between financial leverage and shareholder profitability using 225 firm-year observations from 45 firms. Insufficient evidence of a substantial linear association between DAR and EPS is provided by the results, which consistently show positive but statistically insignificant DAR coefficients

across all regression parameters. These findings imply that the debt-to-assets ratio by itself provides little explanation for shareholder profits in the sample under study. When assessing business performance, the study emphasizes the significance of taking operating profitability, financing costs, and firm-specific financial features into account. The results should be regarded with caution due to the parsimonious model formulation and irregular panel configuration. More financial factors and more thorough longitudinal data should be included in future studies.

Keywords: Debt to Assets Ratio (DRA), Earnings Per Share (EPS), Business Administration, Financial Leverage, Capital Structure, Construction Firm

JEL Classifications: O15, M12, M54, K31, A13, A14

1. Introduction

Because financing choices affect a company's financial flexibility, risk exposure, and capacity to produce returns for shareholders, capital structure continues to be a key concern in corporate finance. While preserving ownership for current shareholders, debt financing may give access to resources needed for investment and growth. However, an over-reliance on borrowing can raise the danger of financial difficulty, interest commitments, and vulnerability to unfavorable economic situations. Therefore, it is especially crucial to comprehend the relationship between financial leverage and shareholder earnings in sectors with high capital requirements, lengthy investment cycles, and uncertainty around project completion and cash flow realization.

An appropriate context for analyzing this link is the construction sector. Before getting paid by clients, construction companies usually rely on outside funding to enable project execution, purchase equipment, and satisfy working capital requirements. Mismatches between funding commitments and operating cash inflows may result from project delays, changes in input costs, and delayed settlements. In these circumstances, debt can help businesses grow and continue operating, but it can also put pressure on profitability and earnings that can be attributed to regular shareholders. Therefore, it is doubtful that the financial effects of leverage will be the same for all construction companies.

There are conflicting theories in the academic literature regarding how corporate borrowing affects the economy. According to the trade-off approach, businesses weigh the possible tax benefits of debt against the anticipated costs of financial difficulty (Kraus & Litzenberger, 1973) [7]. According to Pecking-order theory, corporations typically prioritize internal resources above external finance due to knowledge asymmetry (Myers & Majluf, 1984) [8]. The potential for debt to both discipline managerial behavior and cause disputes between managers, owners, and creditors is further highlighted by agency theory (Jensen & Meckling, 1976) [6]. These viewpoints suggest that rather than exhibiting a generally positive or negative pattern, the link

between leverage and shareholder earnings may vary on the financial circumstances and institutional contexts of enterprises.

Prior studies on capital structure have found significant differences in corporate leverage between businesses and nations. While Frank and Goyal (2009) ^[3] found a number of business characteristics linked to leverage decisions, Rajan and Zingales (1995) ^[9] revealed variations in financing patterns among major industrialized economies. Determining if a company's current debt holdings are linked to better earnings per share (EPS) is conceptually different from analyzing why companies employ debt. Because EPS represents earnings attributable to ordinary shareholders in relation to the weighted-average number of ordinary shares outstanding, the latter question needs special consideration. Therefore, rather than only leverage, changes in EPS may also result from operating performance, financing costs, taxes, and share-count adjustments.

Vietnam provides a pertinent institutional framework for examining this matter. Its construction industry comprises listed companies working under a range of financial conditions, project portfolios, and financing constraints due to its status as an emerging economy. Depending on their operations and cash availability, businesses may have different borrowing needs and financial risks. In this context, EPS reflects an accounting-based measure of earnings attributable to each ordinary share, while the debt-to-assets ratio (DAR) offers a simple indicator of the percentage of assets financed by liabilities. Analyzing their relationship can provide initial proof of whether variations in financial leverage are correlated with variations in shareholder profits.

Using financial data from 45 construction companies registered on the Hanoi Stock Exchange, this study examines the connection between DAR and EPS. The study uses alternative panel-data estimators to assess the statistical relationship between these indicators rather than assuming that borrowing inevitably increases or decreases shareholder earnings. The results may be interpreted in the context of both well-established capital structure theories and the constraints of a single-explanatory-variable specification because the analysis is purposefully focused on a parsimonious relationship.

The study aims to make three contributions. In order to focus emphasis on an outcome that is directly relevant to common shareholders, it first looks at shareholder earnings rather than only depending on traditional firm-level profitability measures. Second, it offers sector-specific data from Vietnamese listed construction companies, where the relationship between leverage and financial results may be complicated by financing requirements and project-related risks. Third, the study assesses whether the observed DAR–EPS connection is consistent across various estimate techniques by taking into account alternate panel estimators. The results should be interpreted within the parameters of the available data and model design because these contributions are exploratory rather than causal.

This is how the rest of the paper is structured. The theoretical framework and research hypotheses are developed in Section 2. The data, variables, and estimation method are explained in Section 3. The empirical results are presented in Section 4. Their theoretical and practical consequences are covered in Section 5, and the study's

shortcomings and future research objectives are discussed in Section 6.

2. Theoretical Background and Hypothesis Development

2.1 Capital Structure and Financial Leverage

The finance arrangements that businesses use to support their assets and activities, especially the combination of debt and equity financing, are referred to as capital structure. When businesses use borrowed funds or other liabilities in addition to shareholder capital, financial leverage results. Leverage establishes contractual commitments that may enhance financial susceptibility when operating cash flows are insufficient, even if it can permit investment without requiring further equity contributions.

Total liabilities divided by total assets is a typical way to express the debt-to-assets ratio. It shows how much of a company's assets are funded by debts owed to creditors and other claimants. In general, a larger DAR indicates a stronger reliance on liabilities in comparison to the asset base. However, DAR should not be understood as a pure measure of interest-bearing debt or borrowing costs because total liabilities may comprise both interest-bearing borrowings and non-interest-bearing obligations. For construction companies, whose liabilities may include trade payables, client advances, and other operational responsibilities, this distinction is very important.

Earnings attributable to ordinary shareholders and the weighted-average number of outstanding ordinary shares are used to compute earnings per share, which is the amount of profit or loss attributable to each ordinary share (International Accounting Standards Board [IASB], 2024) ^[5]. Although it doesn't measure stock market returns or the generation of shareholder wealth directly, EPS offers an accounting-based indicator of shareholder earnings. The profitability of debt-financed activities, interest costs, taxes, and shifts in the share base are some of the factors that could explain its relationship with leverage.

Therefore, a larger debt-to-assets ratio does not always translate into a higher or lower earnings per share. Whether financing arrangements support profitable operations and whether the ensuing advantages outweigh the financial costs and risks connected with liabilities determine how it relates to shareholder profitability.

2.2 Trade-Off Theory

An essential explanation for the possible advantages and disadvantages of debt financing is offered by trade-off theory. According to a framework created by Kraus and Litzenberger (1973) ^[7], business financing choices take into account the relationship between tax benefits and anticipated bankruptcy expenses. When circumstances are right, borrowing can add value because interest costs are tax deductible. However, the likelihood and anticipated expenses of financial trouble may also rise with leverage.

When borrowed resources produce enough operating returns and financing arrangements maintain earnings attributable to current owners, debt financing may be linked to increased shareholder profitability from the standpoint of EPS. On the other hand, when the advantages of debt-financed investment are outweighed by interest commitments, financial distress costs, or operational challenges, leverage may be linked to lower EPS.

Construction companies are especially affected by this

theoretical ambiguity. Before income and cash inflows are generated, large projects may need significant funding. Although borrowing can help with project implementation, the financial advantages of leverage may be diminished by extended construction times, cost overruns, and late client payments. Therefore, an unconditional positive link between DAR and EPS is not implied by trade-off theory. Rather, it implies that the connection might change depending on how businesses operate, how much they pay for funding, and how vulnerable they are to financial difficulties.

2.3 Pecking-Order Theory

Pecking-order theory highlights how corporate finance decisions are impacted by knowledge asymmetry. According to Myers and Majluf (1984) [8], companies may favor internal financing since management have access to more knowledge about the company's prospects and asset prices than do external investors. Debt financing may be chosen over issuing new shares when internal funds are inadequate, in part because equity issuance might be especially susceptible to information asymmetry.

According to this viewpoint, leverage may not be a freely selected tactic for optimizing shareholder profits, but rather a reflection of a company's internal cash-generating capabilities and financing requirements. Businesses that are profitable and have enough retained earnings may be less dependent on outside funding, whereas businesses that need investments or have insufficient internal funding may accrue greater liabilities.

As a result, the observed correlation between DAR and EPS could be statistically weak, positive, or negative. When businesses with lesser profitability rely more on outside funding, there may be a negative correlation. When debt finances lucrative investments without further stock issue, there may be a positive correlation. On the other hand, operating performance and financing requirements may vary significantly among businesses, resulting in no consistent linear relationship in the studied sample.

Therefore, while analyzing leverage and EPS among a diverse collection of construction businesses, Pecking-order theory emphasizes the significance of avoiding a predefined directional expectation.

2.4 Agency Theory

By taking into account conflicts of interest among business stakeholders, agency theory provides a supplementary explanation. Financing structures have an impact on agency relationships and how incentives and risks are distributed inside organizations, as Jensen and Meckling (1976) [6] show. Because debt imposes contractual payback requirements and increases external scrutiny, it may limit managerial choices. These kinds of approaches can promote better resource allocation and financial discipline.

However, leverage can also result in agency expenses. Investment choices, risk-taking behavior, and financing flexibility can all be impacted by disputes between creditors and shareholders. Highly leveraged companies could be encouraged to take on riskier ventures or run into limitations that keep them from making otherwise lucrative investments.

Project uncertainty and the challenge of projecting future cash flows may make these agency considerations more significant for construction companies. While management must weigh project expansion against liquidity and payback

responsibilities, creditors may impose covenants or collateral restrictions. Therefore, corporate governance, project performance, and finance arrangements all have an impact on earnings attributable to shareholders.

Therefore, without showing a consistent relationship between DAR and EPS, agency theory supports the idea that debt can be linked to both positive and negative financial consequences.

2.5 Hypothesis Development

When combined, pecking-order theory, agency theory, and trade-off theory offer complementary but distinct explanations of corporate leverage. Pecking-order theory stresses information asymmetry and funding preferences; agency theory emphasizes incentives, monitoring, and stakeholder disputes; and trade-off theory concentrates on financing advantages and distress costs. A larger debt-to-assets ratio does not necessarily translate into higher earnings per share, according to any of these viewpoints.

The two variables' measuring characteristics further confound the link. While EPS is dependent on both earnings attributable to ordinary shareholders and the weighted-average number of outstanding shares, DAR incorporates liabilities that might not result in explicit interest expenses. As a result, changes in DAR could not correspond to changes in EPS.

These factors are particularly important in Vietnam's construction industry since listed companies may have quite different project finance needs, operating performance, and liability structures. Therefore, it is still empirical to determine the direction and statistical strength of the DAR–EPS association.

On this basis, the study proposes a non-directional hypothesis:

H1: The debt-to-assets ratio is significantly associated with earnings per share among construction firms listed on the Hanoi Stock Exchange in Vietnam.

3. Research Methodology

3.1 Sample Selection and Data Collection

This study examines the relationship between financial leverage and earnings per share among construction firms listed on the Hanoi Stock Exchange (HNX), Vietnam. The dataset comprises 45 firms and 225 firm-year observations, with five observations available for each firm. Financial information was collected from the firms' annual financial records, focusing on the debt-to-assets ratio (DAR) and earnings per share (EPS).

With the exception of 2022, the observations mostly span the years 2020–2025, though some data from 2018 and 2019 are also included. As a result, not all organizations share five consecutive fiscal years in the dataset. Rather, it is an irregular panel where firms have varying combinations of reporting years but an equal amount of observations. When defining the panel structure and analyzing the empirical results, this feature is taken into account.

The sample is limited to the 45 companies that are included in the dataset. The results should not be applied without qualification to all Vietnamese construction companies due to the inconsistent temporal coverage and lack of a single annual observation window.

3.2 Variable Measurement

Earnings per share (EPS), an accounting-based indicator of

earnings attributable to common shareholders, is the dependent variable. Basic EPS is conceptually determined by dividing earnings attributable to ordinary shareholders by the weighted-average number of outstanding ordinary shares in accordance with IAS 33 (International Accounting Standards Board [IASB], 2024) [5]. The dataset's stated EPS values are used in the study.

The debt-to-assets ratio (DAR), which is determined by dividing total liabilities by total assets and reported as a percentage, is the independent variable. As a proxy for financial leverage based on accounting, DAR shows the percentage of business assets financed by liabilities. This measure should not be equated with interest-bearing debt because total liabilities may include non-interest-bearing obligations.

The recorded financial values of both variables are used for analysis. Instead of treating DAR as an exogenous determinant of shareholder profitability, the analysis concentrates on their statistical correlation.

3.3 Econometric Model

The baseline specification is expressed as:

$$[EPS_{it} = \beta_0 + \beta_1 DAR_{it} + \varepsilon_{it}]$$

The research uses generalized least squares (GLS), fixed-effects estimation (FEM), random-effects estimation (REM), and pooled ordinary least squares (OLS). Without specifically modeling firm-specific heterogeneity, pooled OLS offers a baseline association. While REM models unobserved firm-specific effects under the premise that they are uncorrelated with the explanatory variable, FEM permits time-invariant firm characteristics that may be associated with DAR (Wooldridge, 2010) [10].

Another alternative panel estimate method that has been reported is GLS. It should not be regarded as an automatic adjustment for all panel-data restrictions since its interpretation is dependent on the presumed error covariance structure.

3.4 Model Selection and Diagnostic Procedures

The Breusch–Pagan Lagrange multiplier test, which analyzes the significance of random effects in relation to pooled OLS, and the Hausman specification test, which assesses systematic discrepancies between FEM and REM estimates, are used to guide model selection (Hausman, 1978; Breusch & Pagan, 1980) [4, 1].

Correlation analysis and the reported heteroskedasticity assessment are further diagnostic techniques. The DAR coefficient's statistical significance is mostly assessed at the 5% level.

The results may be susceptible to unobserved time-varying factors, omitted variables, and sample composition due to the dataset's non-consecutive fiscal-year observations and the regression's single explanatory variable. As a result, estimated links are understood as associations rather than causal effects, and the research is exploratory.

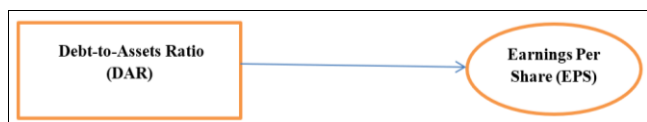


Fig 1: Research model

4. Results

4.1 Descriptive Statistics and Correlation Analysis

The descriptive data for the debt-to-assets ratio (DAR) and earnings per share (EPS) are shown in Table 1, and their association is shown in Table 2. The dataset includes 225 observations from 45 publicly traded construction companies, with significant differences in shareholder earnings and financial leverage. There appears to be little linear co-movement between DAR and EPS, as indicated by the positive but extremely weak correlation coefficient ($r = 0.0381$) (Bryman & Cramer, 2001) [2]. From an economic perspective, this suggests that variations in the observed sample's earnings per share are not closely correlated with variations in enterprises' liability-to-asset proportions.

Table 1: General descriptive statistics and detailed descriptive statistics

. summarize eps dar					
Variable	Obs	Mean	Std. Dev.	Min	Max
eps	225	75.88444	47.99512	1	169
dar	225	112.8756	64.90751	1	224
. tabstat eps dar, statistics(count sum range var cv skewness kurtosis median)					
stats	eps	dar			
N	225	225			
sum	17074	25397			
range	168	223			
variance	2303.531	4212.984			
cv	.6324764	.575036			
skewness	.2864493	-.0075249			
kurtosis	1.84555	1.793706			
p50	69	113			

Source: Compiled by the author and Stata 13 software

Table 2: Results of the correlation analysis between the independent and dependent variables

. correlate dar eps		
(obs=225)		
	dar	eps
dar	1.0000	
eps	0.0381	1.0000

Source: Compiled by the author and Stata 13 software

4.2 Regression Results and Diagnostic Tests

The primary specification and diagnostic tests are reported in Table 4, and the pooled OLS, fixed-effects, random-effects, and GLS estimates are summarized in Table 3. All four estimators have positive DAR coefficients (0.0281, 0.1519, 0.0742, and 0.0508, respectively), but none of them are statistically significant at the 5% level (all p-values > 0.05) (Bryman & Cramer, 2001) [2]. Additionally, the pooled OLS model has very little explanatory power ($R^2 = 0.0014$). While the Breusch-Pagan Lagrange multiplier test shows significant panel effects in relation to pooled OLS ($p < 0.001$), the Hausman test does not reject the random-effects specification ($p = 0.2951$) (Bryman & Cramer, 2001) [2]. Overall, there is inadequate statistical evidence of a linear DAR–EPS connection, and the results do not support H1. Given their statistical uncertainty and the model's narrow explanatory scope, the calculated coefficients' economic size should not be regarded as a trustworthy leverage-related change in shareholder earnings, even though they are regularly positive.

Table 3: Regression results**OLS**

```
. regress eps dar
```

Source	SS	df	MS	
Model	747.780377	1	747.780377	
Residual	515243.215	223	2310.50769	
Total	515990.996	224	2303.53123	

eps	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dar	.0281493	.0494806	0.57	0.570	-.06936 .1256587
_cons	72.70707	6.439161	11.29	0.000	60.01768 85.39646

Number of obs =	225
F(1, 223) =	0.32
Prob > F =	0.5700
R-squared =	0.0014
Adj R-squared =	-0.0030
Root MSE =	48.068

Source: Compiled by the author and Stata 13 software

FEM

```
Fixed-effects (within) regression
Group variable: msck
```

R-sq: within = 0.0126	Obs per group: min = 5
between = 0.0003	avg = 5.0
overall = 0.0014	max = 5

corr(u_i, Xb) = -0.2155	F(1,179) = 2.29
	Prob > F = 0.1318

eps	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
dar	.1518675	.1003042	1.51	0.132	-.0460632 .3497983
_cons	58.74231	11.55901	5.08	0.000	35.93285 81.55177

sigma_u	37.608816
sigma_e	34.939272
rho	.53674713 (fraction of variance due to u_i)


```
F test that all u_i=0: F(44, 179) = 5.52 Prob > F = 0.0000
```

Source: Compiled by the author and Stata 13 software

REM

```
Random-effects GLS regression
Group variable: msck
```

R-sq: within = 0.0126	Obs per group: min = 5
between = 0.0003	avg = 5.0
overall = 0.0014	max = 5

corr(u_i, X) = 0 (assumed)	Wald chi2(1) = 1.21
	Prob > chi2 = 0.2718

eps	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
dar	.0742042	.0675221	1.10	0.272	-.0581367 .206545
_cons	67.50861	9.41016	7.17	0.000	49.06503 85.95218

sigma_u	33.556956
sigma_e	34.939272
rho	.47982731 (fraction of variance due to u_i)

. estimates store REM

```
. hausman FEM REM
```

	Coef.	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
		FEM	REM	Difference	S.E.
dar	.1518675	.0742042	.0776634	.0741734	


```
b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(1) = (b-B)'[(V_b-V_B)^(-1)](b-B)
      = 1.10
Prob>chi2 = 0.2951
```

```
. xttest0
```

Breusch and Pagan Lagrangian multiplier test for random effects

```
eps[msck,t] = Xb + u[msck] + e[msck,t]
```

Estimated results:

	Var	sd = sqrt(Var)
eps	2303.531	47.99512
e	1220.753	34.93927
u	1126.069	33.55696


```
Test: Var(u) = 0
      chibar2(01) = 97.46
      Prob > chibar2 = 0.0000
```

Source: Compiled by the author and Stata 13 software

GLS

```
Coefficients: generalized least squares
Panels: heteroskedastic
Correlation: no autocorrelation
```

Estimated covariances =	45	Number of obs =	225
Estimated autocorrelations =	0	Number of groups =	45
Estimated coefficients =	2	Time periods =	5
		Wald chi2(1) =	1.67
		Prob > chi2 =	0.1959

eps	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]
dar	.0508379	.0393064	1.29	0.196	-.0262012 .127877
_cons	67.32876	4.904852	13.73	0.000	57.71542 76.94209

Source: Compiled by the author and Stata 13 software

Table 4: Principal specification and diagnostic tests

```
. estat vif
```

Variable	VIF	1/VIF
dar	1.00	1.000000
Mean VIF	1.00	

```
. estat hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of eps

chi2(1) =	0.45
Prob > chi2 =	0.5012

Source: Compiled by the author and Stata 13 software

4.3 Discussion

The results show that among the studied construction companies, there is no statistically significant correlation between the debt-to-assets ratio (DAR) and earnings per share (EPS). The trade-off perspective of Kraus and Litzenberger (1973) ^[7], which contends that the costs of financial crisis may outweigh the advantages of debt financing, can be used to explain this conclusion. Additionally, it aligns with the theoretical uncertainty noted by Myers and Majluf (1984) ^[8], whose pecking-order approach prioritizes information asymmetry and finance demands over a constant earnings boost from leverage. The current study takes into account its relationship with shareholder earnings, in contrast to the more comprehensive capital structure studies of Rajan and Zingales (1995) ^[9] and Frank and Goyal (2009) ^[3], which mainly look at the factors that influence company leverage. Instead than offering directly comparable data on the DAR–EPS relationship, these studies offer a conceptual foundation for evaluating the results.

From an economic standpoint, the lack of a significant link implies that, when taken separately, the percentage of assets financed by liabilities offers little insight into variations in shareholder earnings among the studied companies. Although these mechanisms are not directly examined, this could represent differences in project profitability, financing costs, operating efficiency, and liability composition. As a result, the results advise against using DAR as a stand-alone measure of EPS performance. Their contribution is to highlight the significance of business characteristics and financial situations that are not included in the current model, while also showing a statistically inconclusive link in

a sector-specific Vietnamese sample. The results should be considered as exploratory rather than causative or substantially generalizable due to the inconsistent observation intervals and sparse specification.

5. Conclusion

This study used 225 firm-year observations from 45 construction companies registered on the Hanoi Stock Exchange to investigate the relationship between the debt-to-assets ratio (DAR) and earnings per share (EPS). The suggested hypothesis was not sufficiently supported by the estimated association, which was not statistically significant across the stated regression settings. These results imply that variability in EPS within the studied group can only be partially explained by DAR alone.

Practically speaking, when assessing shareholder profitability, corporate management and investors should refrain from depending solely on leverage ratios. Operating profitability, financing costs, cash flow stability, and the makeup of corporate obligations should all be taken into account in financial evaluations. Nevertheless, the current study did not specifically look at these characteristics.

The comparatively small sector-specific sample, non-consecutive fiscal-year observations, and a single-variable regression specification are some of the constraints that should be taken into account. Additionally, causal interpretation is prohibited by the observational design. More extensive panel datasets, firm-specific and macroeconomic factors, and possible nonlinear correlations between leverage and shareholder profitability could all be used in future studies. A better foundation for comprehending the financial effects of capital structure choices in Vietnam's building industry would result from such extensions.

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