Ministry of Education and Training **Ministry of Finance**
ACADEMY OF FINANCE

NGUYEN CHAU HUNG TINH

DETERMINANTS OF CAPITAL STRUCTURE OF LISTED TRANSPORTATION FIRMS IN VIETNAM

Major: Finance - Banking
Code: 9.34.02.01

SUMMARY OF DOCTORAL DISSERTATION IN ECONOMICS

HANOI, 2026

The dissertation was completed at: ACADEMY OF FINANCE

Scientific supervisors:

1. Assoc. Prof. Dr. Doan Huong Quynh
2. Dr. Nguyen Xuan Dien

Reviewer 1: .....

Reviewer 2: .....

Reviewer 3: .....

The dissertation will be defended before the Academy-level Dissertation Evaluation Committee at .....

At ..... on ..... / ..... / .....

The dissertation can be found at:

- National Library of Vietnam
- Library of the Academy of Finance

INTRODUCTION

1. Rationale of the study

Capital structure decisions directly affect the cost of capital and the risk of financial distress. Transportation is a capital-intensive industry whose assets have long useful lives and high specificity, while cash flows fluctuate with the trade cycle.

Among listed transportation firms in Vietnam, the mismatch between asset maturity and funding maturity may be concentrated in a subset of firms. A debt structure tilted towards short-term debt calls for an examination of how well funding maturity matches asset maturity. Two firms with the same total leverage may face different liquidity risks, so separating short-term from long-term debt is necessary.

Four gaps are identified. Theoretically, the dynamic trade-off framework has not incorporated the maturity matching constraint as part of the adjustment process. Contextually, in-depth studies of listed transportation firms in Vietnam remain limited. In measurement, most studies use a single total-debt measure. Methodologically, static specifications do not directly model the adjustment process.

2. Research questions

Question 1: What are the characteristics of the capital structure of listed transportation firms in Vietnam over 2014-2025, in terms of both total leverage and debt maturity structure?

Question 2: How do internal and external determinants affect capital structure, and how do these effects differ between short-term and long-term debt?

Question 3: From a dynamic perspective, at what speed do listed transportation firms adjust their capital structure towards

the target, and how does that speed differ across debt maturity components and across groups of firms?

Question 4: Based on the empirical evidence, which managerial implications and policy recommendations are appropriate to help listed transportation firms control debt maturity risk and improve their adjustment capacity?

3. Research objectives

The general objective is to measure the effects of internal and external determinants on the target capital structure and on the speed of adjustment towards that target among listed transportation firms in Vietnam, as a basis for managerial implications and policy recommendations.

The five specific objectives are: to systematise the theoretical framework; to analyse the state of capital structure on three measures over 2014-2025; to apply a dynamic panel model with system GMM in order to identify the direction and magnitude of the effects and to estimate the speed of adjustment for each maturity component; to propose managerial implications for listed transportation firms; and to propose policy recommendations for funding institutions and state management agencies.

4. Research object and scope

The research object comprises the determinants of the target capital structure and of the speed of adjustment towards that target. Three observed debt ratios are used: total leverage (LEV), the long-term debt to total assets ratio (LTDTA) and the short-term debt to total assets ratio (STDTA).

The data cover 116 listed transportation firms over 2014-2025, with 1,351 valid observations and 1,235 observations entering the estimation. The conclusions are confined to listed transportation firms and are not generalised to the whole industry.

5. Research methods

The study is primarily quantitative, combined with document synthesis and analysis. The main model is a dynamic panel model estimated by two-step system GMM with Windmeijer-corrected standard errors. Pooled OLS, fixed effects and random effects models with a lagged dependent variable serve as reference estimators used to establish the Bond (2002) reference interval.

6. New contributions of the dissertation

First, the dissertation incorporates the maturity matching principle into the interpretive framework of capital structure adjustment, alongside adjustment costs in the dynamic trade-off theory. This is an interpretive mechanism proposed for further testing; the dissertation does not build a formal optimisation model.

Second, the dissertation proposes classifying determinants into two channels: the channel that shifts the target level and the channel that changes the speed of convergence towards that target.

Third, methodologically, the dissertation estimates three measures separately on the same sample and the same set of explanatory variables, and combines the implied speed of adjustment with a test of the hypothesis that the coefficient on the lagged dependent variable equals one.

Fourth, in practical terms, the dissertation identifies maturity mismatch as a risk independent of the level of debt, proposes adding the gap between long-term assets and long-term funding to the monitoring system, and provides a reference dataset for six transportation sub-sectors.

7. Structure of the dissertation

Besides the introduction, conclusion, references and appendices, the dissertation comprises five chapters: Chapter 1 Literature review; Chapter 2 Theoretical framework; Chapter 3 Research methods and model; Chapter 4 Results and discussion; Chapter 5 Conclusions and managerial implications.

CHAPTER 1. LITERATURE REVIEW

1.1. Research on capital structure

Research on capital structure has developed along two axes. The first is the succession of theories from Modigliani & Miller (1958) to the trade-off theory, the pecking order theory and the agency cost theory. The second is the shift from a static to a dynamic approach, in which the observed debt ratio is only an intermediate state on the path towards the target.

1.2. Research on the determinants

Internal determinants include firm size, profitability, asset tangibility, growth opportunities, liquidity, capital expenditure, business risk and state ownership. External determinants include economic growth, inflation and macroeconomic shocks. The dissertation adds a separate review of the measures, variable groups and estimation techniques used in prior studies, stating the limitations of each technique.

1.3. Research on the transportation industry

International research has examined target capital structure and the adjustment process in maritime shipping, notably Drobetz et al. (2013). Within the literature reviewed, what remains to be clarified is the evidence for listed transportation firms in Vietnam, the differences across maturity components and the range over which the conclusions hold.

In the maritime segment, Drobetz et al. (2013) show that the capital structure of listed shipping companies worldwide is strongly shaped by fixed asset characteristics and freight market volatility, with long-term debt above the general level because vessels have a liquid secondary market. Yang et al. (2022) compare 60 shipping companies in Korea with 32 in Greece and find that the financial and institutional environment changes the

use of debt. In Vietnam, Bui Thi Ngoc et al. (2023) record that services, transport and aviation were heavily affected in 2020 and 2021.

1.4. Assessment and research orientation

Stable findings include the positive effect of size, the negative effect of profitability and the role of collateral for long-term debt. Dispersed findings concern growth opportunities, capital expenditure and business risk. The dissertation adopts a dynamic framework, estimates the three measures separately and confines its conclusions to the sample.

The four research gaps and the way the dissertation addresses them are summarised below.

Gap	Content	Treatment
Theory	The dynamic trade-off framework does not incorporate the maturity matching constraint as a parameter governing the speed of adjustment	The maturity constraint is treated as a context condition when interpreting the speed of adjustment
Context	Few in-depth studies on listed transport firms in Vietnam; the industry is usually treated as a homogeneous block	The sample is restricted to transport and differences across six sub-sectors are tested
Measurement	Most studies estimate the speed of adjustment on a single total debt measure	Three measures, LEV, LTDTA and STDTA, are estimated in parallel
Method	Static approaches with Pooled OLS, FE and RE do not handle persistence and the endogeneity of the lagged variable	A dynamic panel model with two-step System GMM is used

CHAPTER 2. THEORETICAL FRAMEWORK ON CAPITAL STRUCTURE AND ITS DETERMINANTS

2.1. Concepts

Capital structure is the proportion of liabilities and owners' equity in the total funding of the firm, with liabilities analysed by maturity into short-term and long-term debt. Borrowings carry contractual obligations of principal and interest, whereas payables arising from operations do not automatically bear interest.

The target capital structure is the proportion the firm pursues in the long run; it is a latent quantity that is not directly observed. The ultimate objective of the firm is to raise firm value, with profitability and financial safety as intermediate objectives. The speed of adjustment is the share of the gap between the actual and the target structure that is closed within one period.

2.2. Features of capital structure in transportation

Transportation assets are large in value, long-lived and highly specific. Following Williamson (1988) and Shleifer & Vishny (1992), specific assets have low liquidation value, which weakens their collateral function. The maturity matching principle requires long-term assets to be financed with funding of corresponding maturity; where the long-term capital market is limited, firms face a constraint on the maturity of available funding.

Sub-sector characteristics operate as a moderating factor through three channels. The first is asset composition and specificity: following Williamson (1988) and Shleifer & Vishny (1992), the same share of tangible fixed assets creates different debt capacity depending on whether the asset has a secondary

market. The second is the cash flow cycle and the stability of revenue. The third is access to long-term funding sources specialised in each asset type.

2.3. Underlying theories

The dissertation draws on the trade-off and dynamic trade-off theories, the pecking order theory, the agency cost theory, the debt maturity structure theory with the maturity matching principle, and the soft budget constraint theory. The role of each theory is set out explicitly: which theories underpin the hypotheses and which are used only for interpretation. Market timing theory is discussed qualitatively and is not tested directly.

Dynamic trade-off theory explains why transport firms do not return to the target level within a single period. Adjustment costs include the transaction cost of arranging new loans, the liquidation cost of specialised assets and the cost of renegotiating credit terms. When these costs are large relative to the cost of deviating, firms accept a deviation lasting several periods.

Pecking order theory explains the negative relationship between profitability and leverage. Firms prefer retained earnings, then debt, with equity issuance as the last resort, so stable operating cash flows substitute for part of the demand for debt.

Agency cost theory adds the monitoring dimension. Debt constrains free cash flow and limits overinvestment by managers, while the agency cost of debt arises at high leverage.

2.4. Determinants and research hypotheses

Each determinant is selected on three criteria, namely theoretical grounding, empirical evidence and relevance to

listed transportation firms in Vietnam, and is linked to an economic mechanism and a directional prediction for each debt measure. Industry-specific features are analysed through three trends, namely green growth, the circular economy and digital transformation, and are examined through group dummies and interaction terms.

The research hypotheses are summarised below.

Hypothesis	Content
H1	Capital structure is persistent; the coefficient on the lagged variable is positive and lies in (0; 1)
H2	Firm size has a positive effect on leverage, more clearly on long-term debt
H3	Profitability has a negative effect on leverage
H4	Asset tangibility has a positive effect on the long-term debt ratio
H5	Growth opportunities have a negative effect on leverage
H6	Liquidity has a negative effect on leverage
H7a, H7b	Capital expenditure has a positive effect on long-term debt and a negative effect on short-term debt
H8	Inflation is related to leverage; the direction is left to the data
H9	Economic growth has a positive effect on leverage
H10	The pandemic shock changes capital structure
H11	Business risk has a negative effect on leverage
H12	The speed of adjustment differs between state-controlled and private firms

CHAPTER 3. RESEARCH METHODS AND MODEL

3.1. Research design

The design proceeds in six steps: identifying the research gap and questions; formulating the hypotheses; collecting and processing the data; estimating the reference models to establish the Bond interval; estimating the dynamic model by two-step system GMM; and running the diagnostic and robustness tests.

3.2. Variables and model

The three dependent variables are LEV, LTDTA and STDTA, measured at book value. The eight firm-level explanatory variables are SIZE, ROA, TANG, GROW, LIQ, CPX, VOL and STATE. The two macroeconomic variables are GDP and INF.

The partial adjustment model takes the form $Y_{(i,t)} = \beta_0 + \beta_1 \cdot Y_{(i,t-1)} + \Sigma\, \beta_k \cdot X_{(k,i,t)} + ui + \varepsilon_{(i,t)}$, where Y is one of the three debt measures. The speed of adjustment is computed as $SOA = 1 - \beta_1$.

3.3. Data and sample

The sample comprises 116 listed transportation firms over 2014-2025, with 1,351 observations for descriptive analysis and 1,235 observations entering the estimation. A firm enters the sample if it meets three conditions on its field of activity under VSIC 2018 and the related transport-support groups, on its listed status, and on a minimum of two consecutive years of data. Variables are winsorised at the 1st and 99th percentiles; a sub-sector winsorised dataset is also compared.

3.4. Estimation and testing

The dissertation adopts two-step system GMM to address the endogeneity of the lagged variable and unobserved fixed effects, within the identifying assumptions and diagnostics reported. The instrument set is collapsed with finite lag windows: lag(4 6) for LEV, lag(3 5) for LTDTA and lag(3 4) for STDTA.

The testing system includes AR(1), AR(2), Hansen, Difference-in-Hansen, control of the number of instruments relative to the number of firms, Wald tests of $\beta 1 = 0$ and $\beta 1 = 1$, and the Pesaran cross-sectional dependence test. Robustness checks cover a market-value measure, two treatments of the time dimension, interaction terms, exclusion of firms with persistently negative equity, two winsorised datasets, and the Brent oil price and the exchange rate. Variable groups left out of the main model are justified on technical grounds.

The definition and measurement of the variables are summarised below.

Variable	Symbol	Measurement
Leverage	LEV	Total liabilities / Total assets
Long-term debt ratio	LTDTA	Long-term debt / Total assets
Short-term debt ratio	STDTA	Short-term debt / Total assets
Firm size	SIZE	Natural logarithm of total assets
Profitability	ROA	Profit after tax / Total assets
Asset tangibility	TANG	Net tangible fixed assets / Total assets
Growth opportunities	GROW	Market value of assets / Book value of assets

Liquidity	LIQ	Current assets / Current liabilities
Capital expenditure	CPX	Sign-reversed capital expenditure / Total assets
Economic growth	GDP	Annual real GDP growth rate
Inflation	INF	Annual inflation rate
Pandemic shock	COVID	Dummy equal to 1 for 2020 and 2021
Business risk	VOL	Three-year rolling standard deviation of ROA
State ownership	STATE	Dummy equal to 1 if average state ownership exceeds 50%

The estimation setup of the three main models is summarised below.

Item	LEV	LTDTA	STDTA
Lag window of the dependent variable	lag(4 6)	lag(3 5)	lag(3 4)
Collapsed instrument matrix	Yes	Yes	Yes
Number of instruments	31	31	24
Observations used in estimation	1,235	1,235	1,235
Number of firms	116	116	116

The lag window is selected so that the number of instruments stays below the number of firms in the sample and the diagnostics remain within an interpretable range.

CHAPTER 4. RESULTS AND DISCUSSION

4.1. The state of capital structure

Average total leverage rose from 48.61% in 2014 to 58.65% in 2025. Short-term debt to total assets rose from 29.93% to 38.13%, while long-term debt to total assets fell from 18.67% to 15.98%. The ratio of short-term to long-term debt rose from 1.60 to 2.39 times.

Year	LEV (%)	STDTA (%)	LTDTA (%)
2014	48.61	29.93	18.67
2017	50.57	32.59	17.98
2019	53.71	34.88	16.98
2021	55.25	36.54	16.62
2023	57.36	37.92	16.92
2025	58.65	38.13	15.98

The share of tangible fixed assets fell from 42.3% in 2014 to 28.4% in 2025, reflecting a shift towards service segments that are less asset intensive. The average current ratio rose from 2.13 to 3.60 times. On maturity structure, the share of short-term debt in total debt stays high throughout the period and rises gradually, while the long-term debt ratio falls from 18.67% to 15.98%. Funding therefore shifts towards the short end at the same time as leverage increases.

Two groups of causes are analysed. Objective causes include asset specificity, the limited development of domestic long-term funding channels and the pandemic shock. Subjective causes include revolving funding strategies, a thin equity base, low investment intensity and a higher reliance on short-term credit among private firms.

Descriptive statistics of the variables after winsorising at the 1% and 99% levels are presented below.

Variable	N	Mean	Std. dev.	Median
LEV	1,351	0.537	0.760	0.376
LTDTA	1,351	0.174	0.283	0.064
STDTA	1,351	0.346	0.555	0.208
MLEV	1,189	0.395	0.277	0.342
SIZE	1,351	27.028	1.615	26.873
ROA (%)	1,351	6.761	11.248	5.727
TANG	1,351	0.345	0.254	0.305
GROW	1,351	1.340	1.150	1.010
LIQ	1,351	3.001	4.041	1.721
CPX	1,351	0.007	0.133	0.003
VOL	1,119	0.040	0.051	0.021
GDP (%)	1,351	6.128	1.729	6.810
INF (%)	1,351	2.967	0.877	3.230

The mean of LEV exceeds its median, reflecting a right-skewed distribution driven by a group of highly leveraged firms. The correlation between LEV and STDTA reaches 0.917, a mechanical relationship because short-term debt is the larger component of total debt.

4.2. GMM estimation results

The coefficients on the lagged dependent variable are 0.926, 0.947 and 0.929 respectively, all significant at the 1% level.

Measure	β1	SOA	Half-life	p (β1 = 1)

LEV	0.926***	7.4%	9.1 years	0.026
LTDTA	0.947***	5.3%	12.8 years	0.492
STDTA	0.929***	7.1%	9.5 years	0.213

For LTDTA and STDTA the test does not reject $\beta 1 = 1$ on the full sample, so the speeds of adjustment of these two measures are indicators computed from point estimates rather than statistical evidence of convergence.

The estimation results of the three main models are summarised below.

Variable	LEV	LTDTA	STDTA
Lagged variable	0.926***	0.947***	0.929***
SIZE	−0.029	0.015	−0.023*
ROA	−0.577*	0.006	−0.526
TANG	−0.120	−0.038	0.050
GROW	0.048**	0.000	0.025
LIQ	−0.005	0.001	−0.001
CPX	0.304**	0.009	0.123
GDP	0.005*	0.001	0.004
INF	−0.003	−0.008*	0.004

*Notes: ***, **, * denote significance at the 1%, 5% and 10% levels; Windmeijer-corrected standard errors; 1,235 observations and 116 firms.*

In the dynamic model, growth opportunities and capital expenditure have a positive effect on total leverage at the 5% level; the capital expenditure result is conditional because it loses significance when 2025 is excluded. Profitability and liquidity show clear negative relationships in the reference

channel, consistent with the pecking order theory. Size is associated with a higher level of long-term debt in the reference channel.

4.3. In-depth analysis and robustness

The maturity mismatch indicator is positive in 23.46% of observations, indicating that the phenomenon is concentrated in a subset of firms. After excluding 11 firms with persistently negative equity, the coefficients on the lagged variable fall to 0.802, 0.704 and 0.672.

The six sub-sectors differ significantly at the 1% level on all three measures. Average total leverage is 0.9462 in inland and maritime shipping against 0.2951 in seaports; the long-term debt ratio is 0.5178 in transport infrastructure against 0.0868 in warehousing and logistics. Differences in the speed of adjustment across groups are not confirmed statistically.

Sub-sector	Average LEV
Seaports	0.2951
Road and rail transport	0.3809
Air transport	0.4375
Warehousing and logistics	0.4659
Transport infrastructure	0.7190
Inland and maritime shipping	0.9462

Differences in the level of leverage across sub-sectors are associated with asset characteristics and cash flow cycles. Transport infrastructure has long-term toll contract cash flows and the highest long-term debt ratio. Warehousing and logistics are less asset intensive and show the lowest long-term debt ratio. Air transport has long-lived operating assets while the

average share of short-term debt in total debt reaches 0.7619, an indicator that calls for an assessment of maturity suitability.

The pooled model with an interaction term finds no evidence at the 5% level of a difference in the speed of adjustment by state ownership, with marginal evidence at the 10% level for long-term debt. Sensitivity to the treatment of outliers gives a speed of adjustment for total leverage ranging from 7.4% to 16.04%. The Brent oil price and the exchange rate are not statistically significant in the specifications reported.

On robustness, the market-value leverage measure gives a coefficient on the lagged variable of 0.744, inside the Bond reference interval computed on the same sample.

The diagnostics of the three main models lie within an interpretable range. The numbers of instruments are 31, 31 and 24, well below the 116 firms in the sample. The AR(2) and Hansen tests do not reject the null at the 5% level, which is supporting evidence rather than proof of instrument validity. Difference GMM is reported as a reference model and gives the same direction of conclusion.

On the subsample that excludes the 11 firms with negative equity, the coefficients on the lagged variable are 0.802, 0.704 and 0.672, so the conclusion on persistence does not change. The speed of adjustment of total leverage ranges from 7.4% to 16.04% depending on the treatment of outliers, so the point estimate must be read together with that treatment.

4.4. Discussion

The results are compared with the pecking order theory, the dynamic trade-off theory, the agency cost theory and institutional economics. These frameworks offer complementary interpretations of the level of debt, debt

maturity and persistence. The dissertation does not test the relative explanatory power of each theory.

CHAPTER 5. CONCLUSIONS AND MANAGERIAL IMPLICATIONS

5.1. General conclusions

Persistence is the salient feature of the capital structure of the listed transportation firms in the sample. The results on profitability and liquidity are consistent with the pecking order theory. Maturity mismatch is a risk that warrants separate monitoring, independent of the level of debt. The six sub-sectors differ markedly in the level of debt and in maturity structure. Evidence on differences in the speed of adjustment by state ownership remains limited.

5.2. Implications for transportation firms

The implications are organised by sub-sector and by financial condition: restructuring debt maturity and managing refinancing risk; managing liquidity and developing internal funding; expanding funding capacity through capital partnerships and strategic alliances; managing growth opportunities and investment discipline; and preparing for access to the bond channel. Fuel prices and the green transition are analysed as two external developments to be built into annual financial planning.

The first group of implications concerns restructuring debt maturity. Priority firms are identified on three criteria: a share of short-term debt above their own sub-sector average, a persistently positive maturity mismatch indicator and a low interest coverage ratio. A three-stage roadmap with transition conditions is presented.

The second group concerns liquidity management and internal funding: shortening the average collection period,

controlling fuel and materials inventory turnover and linking profit distribution to reinvestment needs.

The third group concerns preparing for access to the bond channel under the current legal framework, including a continuous credit rating, financial reporting standardised to disclosure obligations, eligible collateral and a use-of-proceeds plan tied to a project with separately identifiable cash flows.

5.3. Implications for credit institutions

Design credit products around the asset life cycle of each sub-sector; shift the focus of appraisal from collateral towards cash flow, combined with collateral assessment; tier credit policy by sub-sector and financial condition; and monitor common risks in the transportation lending portfolio.

5.4. Policy recommendations

Improve the conditions for access to the corporate bond market; develop long-term funding channels beyond bank credit; use the public-private partnership mechanism as a long-term funding channel for infrastructure; and stabilise the macroeconomic environment with liquidity support instruments for shocks. The responsible body is named for each group of recommendations, namely the Ministry of Finance, the State Securities Commission, the State Bank of Vietnam, the Ministry of Construction and the Ministry of Industry and Trade.

The implications of the dissertation are summarised by target group below.

Group	Core implication
Transport firms	Restructure debt maturity along the asset life cycle; manage liquidity and develop internal

	funding; prepare the conditions for access to the bond channel
Credit institutions	Design credit products along the asset life cycle of each sub-sector; shift the focus of appraisal towards contractual cash flows
Regulators	Improve the conditions for access to the corporate bond market; develop long-term funding channels beyond bank credit

5.5. Limitations and further research

The study is confined to listed firms, does not separately identify supply-side constraints and does not rank adjustment speeds across the six sub-sectors. Further research could extend the sample to unlisted firms and use loan contract data to test the maturity matching mechanism directly.

LIST OF PUBLISHED WORKS OF THE PhD CANDIDATE RELATED TO THE DISSERTATION TOPIC

1. Nguyen Chau Hung Tinh (2026), "Capital Structure, Financial Leverage, and Firm Profitability: Evidence from Listed Transport Firms in Vietnam during 2014–2024", Vietnam Economic & Financial Review, Vol. 2, Issue 2 (April 2026).

2. Nguyen Chau Hung Tinh (2026), "Micro-level determinants of the capital structure of listed transportation enterprises in Vietnam", Review of Finance and Economics, Issue 19, April 2026, pp. 163-166 (in Vietnamese).

3. Nguyen Chau Hung Tinh (2026), "Dynamic capital structure adjustment and the asymmetry between short-term and long-term debt: Evidence from listed transportation companies in Vietnam", Review of Finance and Economics, Issue 19, April 2026, pp. 93-96 (in Vietnamese).

4. Nguyen Chau Hung Tinh (2026), "Sub-sector differentiation in capital structure and performance: Evidence from listed transportation enterprises in Vietnam", Review of Finance and Economics, Issue 22, May 2026, pp. 118-121 (in Vietnamese).

5. Nguyen Chau Hung Tinh (2026), "Determinants of the capital structure of listed transportation enterprises in Vietnam: A dynamic capital structure approach", Journal of Finance and Accounting Research, Issue 312, May 2026, pp. 145-148 (in Vietnamese).