UCV UNIVERSIDAD CÉSAR VALLEJO

**Research article**

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# Capital structure and profitability in a heavy freight transport company in Lima, 2015-2025

## Abstract

**Aim/Purpose:** The study set out to determine whether capital structure is related to business profitability in a heavy freight transport company in Lima over 2015-2025. Capital structure was split into leverage, debt maturity and financial autonomy, whereas profitability was captured by return on assets (ROA), return on equity (ROE) and return on sales (ROS).

**Design/methodology/approach:** This applied, quantitative study used a non-experimental design, retrospective and longitudinal, with a descriptive-correlational scope. All 22 semiannual financial statements issued between 2015-I and 2025-II were analysed as a census. Each ratio was computed from the statements by documentary analysis and then summarised descriptively. Normality was rejected by the Shapiro-Wilk test, so Spearman's rho was used to estimate the associations.

**Findings:** Almost no link appeared between capital structure and profitability (rho = 0.050; p = 0.826), and the one between leverage and profitability, although negative, was weak and also non-significant (rho = -0.219; p = 0.327). Over 2020-2025 the firm cut its leverage from 0.59 to 0.29, and financial autonomy went from 0.41 to 0.71. Profitability hit its low point in 2022; by 2025 it had partly recovered, with ROS at 0.41.

**Research implications/limitations:** Firms that run large truck fleets may find it useful to review their financing mix and their profitability ratios side by side at regular intervals. With only one company and 22 semiannual observations, the tests had limited power, and the results should not be read as representative of the sector.

**Originality/value/contribution:** The paper draws on eleven years of semiannual statements from one Peruvian heavy freight carrier and contrasts three capital structure dimensions with three accounting profitability measures, which adds firm-level longitudinal evidence for this industry.

**Keywords:** capital structure; financial leverage; profitability; road freight transport; financial statements

**JEL Classification:** G32; M41; L92

## 1. Introduction

Capital structure refers to the proportions in which a firm finances its operations with equity or with liabilities, and those proportions show how far it depends on third parties and how much backing of its own it retains. A road haulage company needs funds continuously to renew and maintain its trucks, cover working capital and keep its services running, so the way it finances itself soon becomes visible in its accounts. Pinillos et al. (2025) examined Latin American firms in light of the trade-off and pecking order theories and found that indebtedness adjusts gradually and differently in each company; there is, therefore, no single financing pattern in the region.

Conditions in the Peruvian transport sector make this relationship particularly sensitive. In its logistics plan with a 2032 horizon, the Ministry of Transport and Communications (2024) set out improvements for corridors, ports and other sections of the national network. The sector kept growing in 2025, when transport, storage, postal and courier activities rose by 4.98 % and road freight transport by 2.74 %, according to the National Institute of Statistics and Informatics (2026). Growth at that pace forces carriers to handle more services without weakening their solvency or their results.

The amount of debt, taken alone, says little about a firm's position. A company may expand its assets through financial obligations and still end up with low profitability when financial expenses absorb a large share of earnings. Leverage and profitability ratios make it possible to follow that tension in the financial statements, provided they are calculated with the same criteria in every period. Ramírez and Vicente (2021) studied the banks operating in Peru and found only a weak relationship between capital structure and profitability; since banking is a different activity, the result suggests that the link depends on the line of business.

Findings outside Peru are not consistent either. In Spanish small and medium-sized road transport firms, Bueno et al. (2026) showed that short-term and long-term debt relate differently to return on assets and return on equity. Erawati and Hendrawan (2022), by contrast, studied transport and logistics companies listed on the Indonesia Stock Exchange between 2016 and 2020 and found no significant individual effect of capital structure on ROA, which calls for examining each financing component within its own operating context.

Against this background, the study aimed to determine the relationship between capital structure and business profitability in a heavy freight transport company in Lima during 2015-2025. Capital structure was broken down into financial leverage, debt maturity structure and financial autonomy, while profitability was measured through ROA, ROE and return on sales. In addition, the semiannual evolution of both variables was described, and the relationship between financial leverage and profitability was assessed separately.

## 2. Literature review

### 2.1. Capital structure

According to trade-off theory, each firm pursues a level of debt that allows it to benefit from external financing without letting the costs associated with financial risk grow excessively. Drawing on evidence from firms in Gulf Cooperation Council countries, Sunitha (2024) describes this approach as a balance between the benefits of borrowing and the problems brought by an overcommitted financial structure. From this perspective, the same use of debt may prove favourable in some periods and restrictive in others.

Pecking order theory proposes a different sequence. The firm first uses internally generated funds, then turns to debt, and considers issuing equity only when those sources fall short. Muñoz et al. (2023) applied an error correction model to Latin American firms and showed that capital structure adjusts slowly; changes in liabilities and equity are therefore better read as decisions that accumulate over time.

In operational terms, capital structure was measured through three dimensions. Financial leverage was defined as the ratio of total liabilities to total assets. For debt maturity structure, the share of current liabilities in total liabilities was used, and financial autonomy was associated with the portion of assets financed with equity. These ratios make it possible to separate dependence on third parties, the concentration of obligations in the short term and the support provided by equity.

### 2.2. Business profitability

Profitability is understood as the firm's capacity to turn its resources and operations into economic results. Using panel data from private banks in Ethiopia, Ayalew (2021) argues that financing decisions influence the generation of earnings, although with an intensity that varies across sectors and with the particular situation of each organization. A single indicator is therefore insufficient to describe financial performance accurately.

ROA, which relates net income to average assets, was used to measure economic profitability, that is, the return on the resources the firm controls. Financial profitability was assessed with ROE, calculated on average equity. Return on sales was added to both, expressing the share of revenue that ends up as profit. In her review of capital structure in Peruvian small and medium-sized enterprises, Vera (2021) notes that reading these ratios together helps distinguish the return on assets, the return on equity and the return on commercial activity.

### 2.3. Empirical evidence and hypotheses

Previous studies do not reach the same conclusion. Nguyen et al. (2025) identified a bidirectional relationship between capital structure and performance in Vietnamese firms, indicating that financing and returns may influence each other. Purwasih et al. (2025), for their part, reported statistically significant effects of capital structure, liquidity and profitability on the financial performance of transport and logistics organizations.

Satrio et al. (2024), also working in transport and logistics, observed that each financing component explains performance to a different degree and that debt management must take into account the real capacity to generate profits. Given such disparate results, a longitudinal analysis of a single firm's financial statements is warranted, one that can show whether changes in capital structure are accompanied by consistent changes in profitability.

The general hypothesis stated that there is a significant relationship between capital structure and profitability in the heavy freight transport company studied during 2015-2025. For the third specific objective, it was hypothesized that changes in financial leverage were significantly related to business profitability.

## 3. Methodology

The research was applied, with a quantitative approach, a non-experimental design and a retrospective longitudinal time frame. Its scope was descriptive-correlational, since the evolution of the financial indicators was examined first and the association between the variables was then estimated without manipulating their components. The unit of analysis was each semiannual financial statement for the period 2015-2025.

The population consisted of 22 semiannual financial statements, and a census sample of the same size was used. The information came from the statements of financial position, the income statements and the accounting records needed to identify liabilities, equity, assets, sales and profits. Using all available periods avoided any sampling procedure within the company.

Data were collected through documentary analysis using two record sheets, one for each variable. For capital structure, the data required to calculate financial leverage, debt maturity structure and financial autonomy were recorded. For profitability, net income, average assets, average equity and sales were gathered to obtain ROA, ROE and return on sales. The figures for each semester were entered into a Microsoft Excel worksheet, from which the statistical calculations were carried out.

The descriptive analysis included minimum, maximum, mean and standard deviation. To address the general objective, two composite indices were built, one for profitability, obtained as the arithmetic mean of ROA, ROE and ROS, and another for capital structure, formed from its dimensions. The Shapiro-Wilk test yielded $W = 0.876$ ($p = 0.010$) for capital structure and $W = 0.831$ ($p = 0.002$) for profitability; since normality was not met, Spearman's rho coefficient was used.

The financial information was used for academic purposes only, and the identity of the company was kept confidential. Data appear in aggregate form in the manuscript, with no elements that would

allow the organization to be recognized. No interpretation goes beyond what the financial statements record and what the statistical procedures set for each variable allow.

## 4. Results

The 22 semiannual periods showed different degrees of variability across the capital structure dimensions and the profitability indicators. Financial leverage had a mean of 0.4627 and financial autonomy a mean of 0.5418. Among the profitability indicators, ROE showed the highest mean, at 0.1986, whereas return on sales recorded a mean of 0.0659.

**Table 1. Descriptive statistics of the dimensions analyzed**

| Indicator | N | Minimum | Maximum | Mean | Std. deviation |
|---|---|---|---|---|---|
| Financial leverage | 22 | 0.29 | 0.59 | 0.4627 | 0.07869 |
| Debt maturity structure | 22 | 0.17 | 0.58 | 0.3091 | 0.10267 |
| Financial autonomy | 22 | 0.41 | 0.72 | 0.5418 | 0.08969 |
| Return on assets (ROA) | 22 | 0.03 | 0.56 | 0.1209 | 0.11900 |
| Return on equity (ROE) | 22 | 0.06 | 0.58 | 0.1986 | 0.12342 |
| Return on sales (ROS) | 22 | 0.01 | 0.41 | 0.0659 | 0.11202 |

*Note. Data obtained from the statistical processing of the semiannual financial statements.*

Capital structure did not follow a stable path. Leverage peaked in 2020 at 0.59 and then fell to 0.29 in 2025. Debt maturity structure was more irregular, reaching a low of 0.17 in 2020 and rising to 0.58 in 2025. In the final years, financial autonomy moved opposite to leverage and rose from 0.41 in 2020 to 0.71 in 2025, a sign that by the end of the period the company relied less on external funds.

The highest profitability values were concentrated at the beginning of the series. In 2015-II ROA reached 0.56; it dropped to 0.03 in 2022 and stood at 0.09 in 2025. ROE followed a similar course, with 0.58 in 2015-II, 0.06 in 2022 and a recovery to 0.15 in 2025. Return on sales ranged mostly between 0.01 and 0.07 until 2024 and rose to 0.41 in both semesters of 2025.

The specific test between financial leverage and profitability produced a Spearman's rho of -0.219, with p = 0.327. The p-value remained above 0.05. The inverse trend suggested by the sign is weak and, with 22 periods, is not enough to claim a significant association between the two indicators.

**Table 2. Main inferential correlations**

| Relationship analyzed | Spearman's rho | p | N | Result |
|---|---|---|---|---|
| Financial leverage - profitability | -0.219 | 0.327 | 22 | Weak negative; not significant |
| Capital structure - profitability | 0.050 | 0.826 | 22 | Very weak positive; not significant |

*Note. Composite profitability corresponds to the average of ROA, ROE and ROS used in the inferential analysis.*

For the general objective, the correlation between capital structure and profitability was positive but practically null (rho = 0.050). The p-value of 0.826 confirmed that the association was not statistically significant. The general hypothesis, therefore, was not statistically supported by the available data. Variation in financing sources was not accompanied by proportional changes in the return on assets, equity and sales during 2015-2025.

## 5. Discussion

Overall, capital structure and profitability showed a very weak positive association with no statistical significance. With rho = 0.050, changes in the mix of liabilities and equity barely corresponded to the behaviour of the profitability index. This result is consistent with Ramírez and Vicente (2021), who also found a weak relationship between financial structure and profitability in Peru, although their study focused on the banking sector.

In the study by Erawati and Hendrawan (2022), capital structure likewise had no significant individual effect on the ROA of transport and logistics firms. In both studies, indebtedness did not translate uniformly into return on assets, which suggests that the way a firm is financed is only one of the factors explaining its results.

The comparison with Nguyen et al. (2025) is different, since that study found a bidirectional relationship between capital structure and business performance. The discrepancy may stem from the number of firms, the size of the database or the method, because the present study analyzed a single organization with 22 semiannual observations using non-parametric correlations. An association that emerges in large samples of firms need not recur with the same magnitude when a single company is examined.

The trajectory of capital structure adds another element to the discussion. Leverage fell from 0.59 in 2020 to 0.29 in 2025 and financial autonomy rose from 0.41 to 0.71, a movement that, from the pecking order perspective, is compatible with a greater weight of internal resources. Debt maturity structure, however, reached 0.58 in 2025, indicating that the distribution of obligations by term evolved differently from the overall level of leverage.

Bueno et al. (2026) showed that, in road transport firms, short-term and long-term debt relate differently to performance. That finding helps explain why, in the company studied, the reduction in leverage was not accompanied by a uniform path in debt maturities. With a single debt ratio, this difference between the size of financing and its distribution over time would have gone unnoticed.

Profitability fell until 2022 and recovered afterwards. After the high values of 2015, ROA and ROE settled at moderate levels, while ROS went from 0.01 in 2022 to 0.41 in 2025; the indicators, therefore, did not move at the same pace. Ayalew (2021) described something similar with panel data from Ethiopian private banks, where the effect of financing on profitability varied from one institution to another. For this reason, three profitability indicators were used here instead of one.

The coefficient between leverage and profitability, negative and weak, was -0.219 ($p = 0.327$). Semesters with more liabilities tended to show less available profit, which is consistent with the sign, although with $p = 0.327$ this tendency remains an observation specific to the case. Purwasih et al. (2025) obtained significant effects with a model that added liquidity to capital structure and profitability. With more variables, a later study might detect relationships in this company that the simple correlation left hidden.

For the accounting department of a transport firm, the case shows that debt and profitability ratios are better understood when reviewed in the same report. A correlation is not enough to prove that a given capital structure raises profitability. What the analysis offers is an early warning of changes in the company's financial exposure. The behaviour observed between 2020 and 2025 shows that lower dependence on debt can coexist with significant changes in maturities and with an uneven recovery of profitability indicators.

## 6. Conclusions and implications

Between 2015-I and 2025-II, no statistically significant association was found between capital structure and profitability. With an overall correlation of rho = 0.050 and p = 0.826, the form of financing showed no consistent correspondence with changes in the profitability index over the 22 periods analyzed.

Capital structure changed noticeably during the period. Financial leverage fell from 0.59 in 2020 to 0.29 in 2025 and financial autonomy rose from 0.41 to 0.71 over the same interval, while debt maturity structure reached 0.58 in 2025. At the end of the series the company depended less on third parties and relied more on its own resources, with its obligations distributed by term differently from previous years.

Profitability declined until 2022 and then recovered. That year ROA hit a low of 0.03 and ROE one of 0.06; in 2025 the values were 0.09 and 0.15, respectively. Return on sales varied the most, from 0.01 in 2022 to 0.41 in 2025, which made it clear that the indicators did not move in parallel.

Financial leverage and profitability showed a weak negative association (rho = -0.219; p = 0.327). The data do not support the claim that changes in leverage affected profitability in a statistically significant way; what was found is an association and cannot be read as causation.

For the company's financial management, the case suggests calculating the same capital structure and profitability ratios at each semiannual close and reviewing them together. This makes it possible to detect in time changes in debt exposure, in the concentration of maturities or in the capacity to generate results. Such monitoring does not replace professional assessment of financial risks or internal financing policies.

## 7. Limitations and future research

Only one heavy freight transport company was analyzed, with 22 semiannual observations. This made it possible to follow its financial trajectory in detail over eleven years; the cost is that the results cannot be extended to other firms and statistical power is low for detecting small associations. Another carrier, with a different fleet or client portfolio, could behave differently.

Further work should include firms of different sizes and longer series, and incorporate liquidity, operating efficiency, financial expenses and asset turnover. Panel data or longitudinal regression models would also make it possible to test whether the relationship between financing and profitability holds once operating characteristics and macroeconomic conditions are controlled for.

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