Space Exploration and Capital Structure: An Evolving Financial Paradigm

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Abstract

The paper analyzes the determinants of capital structure (CAP) for 87 firms globally involved in tourism and outer space from 2010 to 2023. The data is collected from the Wall Street Journal Website for dependent and independent firm-level variables and from the World Development Indicators (WDI) for macroeconomic variables. The model of pooled ordinary least squares (POLS) and panel data estimation, implemented via feasible generalized least squares (FGLS), is used to examine the capital structure behavior of businesses involved in space exploration and space travel worldwide. The results obtained using size (SIZE) and current assets (CAS) positively affect capital structure (CAP). Inflation (INF), with a positive interaction, helped companies obtain funds at low cost and increase capital. Exchange rate (EXR) has a negative impact on cash flow and leverage effects. The study highlights capital structure, regulations, and decision-making for commercializing space tourism and exploration. The paper's originality lies in the authors' exploration of the determinants of capital structure in the outer space travel and exploration industry, working across the world. The sector is a niche market but a relatively less-studied one in finance, focusing on the edge of borderline economies. Using a contextual approach, the research provides fresh insights into how firms manage financing amid firm-level and macroeconomic variables.

Keywords: ***Space exploration, Space travel, Feasible generalized least squares, Capital structure.***

JEL Classification: C12, C23, O16

INTRODUCTION

Space exploration has seen unprecedented growth over the last few decades, driven by technological advancements, commercial interests, and renewed government ambition. As space missions and projects grow, they become more complex and costly, and can be funded with debt and equity. Space exploration is now a mix of public-private partnerships, privately and government-funded companies. The capital structure for space travel and exploration is

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important for understanding the financial interactions of the niche sector.

The study is conducted to understand the role of innovation in the finance sector, including venture capital, to expand the scope of space exploration in the future. The companies involved in space travel and exploration are capable of attracting equity from private and government financing bodies that provide direct budgets and contractual agreements. The funds enable the firm to build reusable technology such as rockets, pursue long-term missions to visit different planets, stars, and satellite constellations, and innovate in propulsion systems. Promises more efficient interplanetary travel. The latest space machines are made from materials and equipped with cutting-edge technologies, autonomous programs, and electronics to improve performance and increase durability. Artificial intelligence is used to design missions for complex tasks, such as gathering data from distant environments, making space travel and exploration safer and more efficient.

Orbital tourism, initiated by SpaceX's Crew Dragon missions, allows tourists to visit and linger in orbit. Axiom Space's modules and Haven-1 are private space stations for tourists to reach and have a luxurious hotel in space. The plan is feasible by increasing public interest and lowering costs. The space exploration and tourism market may exceed $3 billion by 2030 and is projected to exceed $1 trillion by 2040. The increased interest among space tourists has boosted space exploration for all humanity, not just the wealthy, providing a foundation for a self-sustaining space economy.

Increased human presence in space has caused contamination of the extraterrestrial atmosphere, and resource utilization, and the space debris issue needs to be addressed. Due to space travel and exploration, knowledge of the solar system, star formation mechanisms, and exoplanets helps us understand life beyond Earth. Satellites provide resource management, demonstrating space exploration's relevance to terrestrial challenges. Research conducted in an anti-gravitational environment has improved our understanding of human physiology, thereby aiding medical science. The space exploration and space travel sector supports other sectors and creates jobs in manufacturing, engineering, and research. The sector has inspired STEM fostering and education to unify the globe. Projects like ISS are collaborative efforts by many nations to address issues related to communication, environmental monitoring, and navigation.

The cost of space exploration raises an ethical question about public funds raised as taxes are spent on the missions. Mostly, projects like crewed space missions, satellite launches, and planetary missions are large-scale, long-term financial risks taken by the government, such as Apollo and the ISS. In the new millennium, the private sector showed interest in space exploration and space travel, bringing a new dimension to the sector as a lucrative business.

In 2002, Elon Musk founded SpaceX, which revolutionized space travel and space exploration with private funding to lower costs and increase efficiency. Boeing raised funds through corporate bonds to finance large-scale projects. These bonds allow companies to borrow money at interest.

Virgin Galactic and Astra issued shares via IPOs to increase capital in equity markets, promoting greater transparency and public engagement. Debt financing provides companies with the leverage needed to fund large-scale infrastructure projects. Such as the development of new rockets, space stations, or lunar exploration missions. The challenge of debt financing lies in ensuring that companies can meet their fixed repayment obligations, especially during financial instability. Governments, in turn, can provide loans or grants to private space firms in exchange for technology development or strategic services. For example, NASA has provided funding through its Space Technology Mission Directorate to support innovations in space exploration.

Research Gap

An optimal firm size and tangible assets as current assets help make it easy to borrow money as debt or raise funds as equity. The concept reinforces the Trade-Off theory by providing the collateral facility. Trade-off theory offers an explanation for the concerns of financing decisions made by the firms involved in the business of space travel and space exploration. Trade-Off theory posits that a company can balance the tax advantage of taking on debt or issuing shares to avoid interest expense (Alwan & Risman, 2023). Therefore, revisiting the theory in the specific sectors, economies, and structural realities of the world's space travel and space exploration industry is important. The research has analyzed the data within the theoretical framework of the Trade-Off theory to seek more profound insights into the capital structure behavior of the firms.

Objective

To conduct an analysis of the effect of firm-specific and macroeconomic data on capital structure in countries, with the applicability of the Trade-Off theory in explaining financing behaviors of space travel and space exploration firms.

LITERATURE REVIEW

Capital structure theory is based on the work of Modigliani and Miller (1958) and has been demonstrated at the firm level (Titman & Wessels, 1988). A company can use any percentage of debt and equity to calculate the formula at an optimal level (Modigliani & Miller, 1958). “Market timing theory” for capital structure was given by Baker (2002). The theory suggests that, currently, a company's capital structure results from prior calculations to determine market timing (Baker & Wurgler, 2002). Authors state that share price fluctuations affect a company's capital structure. The theory posits that a firm issues shares and bonds at a high price.

When the value has decreased, the shares are repurchased from the current shareholder (Alipour, Mohammadi, & Derakhshan, 2015). Debt financing is more cost-effective than issuing shares. Hence, companies try to gain capital at an optimal level. WACC may devalue a firm. Similarly, WACC rises when creditors and shareholders believe the company is at risk of bankruptcy, and investors will be compensated according to their investments (Ross, Westerfield, Jordan, & Roberts, 2016). Therefore, the manager's decisions are based on methods that determine the residual free cash flow available to shareholders at the maximum value (Feng 2016; Kiu et al. 2017).

The goal is achieved when financial managers increase their dealings in services and goods, using available cash (Petty et al. 2015). The decision may seem simple, but complications arise when the firm must determine how much cash the business should receive to support economic growth. The financial manager has to make three main decisions: investment decisions, the amount of assets to invest, and the allocation of debt and equity. Secondly, the firms decide to finance the required cash for investment purposes. The third is dividend decisions: deciding the percentage of earnings to be paid out as dividends to stakeholders and the timing of distribution.

A positive relationship between size and capital structure is studied by Chadha & Sharma (2015) and Fama and French (2002). The logarithm of total assets is a proxy to measure size, as assets fluctuate less. Big companies borrow less money as they have collected retained earnings and cash flow, as a substitute for huge debt. Large companies rely on internal financing over external funding during a financial crisis. Because bank policies are strict during a crisis, companies prefer equity issues over debt, as shares devalue, which is a poor option in the secondary market. (Demirgüç-Kunt et al., 2018; Laeven et al., 2016), the highly regulated capital can decrease as capital is considered a buffer against economic shocks.

When bank size increases, systematic risk also rises, especially for state-owned banks relative to joint-stock and local government-holding banks. The literature emphasizes that policymakers and regulatory bodies must consider the systemic implications of bank size and ownership structures when designing regulations to protect the stability of the financial framework. (Bitar, M., Pukthuanthong, K., Walker, T., 2018). Large banks can handle lending risk or diversify it across a broader loan risk profile. This highlights the importance of diversification, leveraging a good reputation and access to the financial markets.

Laeven et al. (2016) & Zhang et al. (2021) worked on big banks to know the higher systemic risk., Also, the risk and growth levels depend on capital regulations and limit the number of new assets a company can buy with debt financing. (Koch & MacDonald, 2015), the level of losses accepted by capital from risky assets, as a high percentage meant the bank capital can bear more losses from risky assets. (De George et al., 2016). According to the trade-off theory, a higher capital structure indicates that a company uses a large percentage of debt relative to equity to fund the business. At the start, leverage may boost asset growth by providing more funds to expand the business and to invest across more investment platforms.

High debt financing leads to a lower cost of capital, which enables strategies for asset accumulation and growth. However, it is important to monitor and control leverage closely to prevent rising debt levels that can lead to a financial crisis. Policymakers should draft a framework that enhances access to and responsible management of debt to foster an environment conducive to economic growth. Investors' confidence and effective methods for allocating capital attract investment for asset expansion (De George et al., 2016; Neel, 2017; Opare et al., 2021). The financial data helps in decision-making and builds investor trust.

Inflation is a proxy for the ability of a government-managed economy, calculated as the percentage change in the consumer price index. Inflation is a social ill, a cost borne by welfare. Inflation should be anticipated; if not, it may lead to an uneven distribution of wealth and income. Also, it reduces the efficiency of the market system by disturbing the function of relative prices that coordinate the economy. At the company level, inflation is expected to remain steady. Involving the shift of wealth from bonds to shareholders. Inflation-induced uncertainty increases a firm's business risk, as reflected in its earnings volatility.

The firm's sales, price, and cost structure become volatile due to inflation, causing business risk. Inflation uncertainty may increase the volatility of the company's operating income and lead to insolvency. The real capital structure of a company is calculated by assessing the strength of the firm's cash flows, based on fixed charges arising from debt financing. In this case, the firm funds the company by issuing equity capital. Therefore, the capital structure ratio will be lower. When the firm finances debt and the business collapses, it issues new shares on unfavorable terms. The only solution is for the firm to keep cash flow uncertainty in mind, maintain some flexibility, and keep debt funds on hand for the future.

Inflation volatility makes the corporate tax shield uncertain, raising business risk and potentially leading to losses. When more debt is used, tax savings become uncertain, and the shareholders' loss value is zero, as Fisher's theory proposes. The nominal rate of return on assets is the sum of the expected inflation rate and the real rate of return. The nominal rate is the hedge against inflation. The investors are compensated for losses due to a decrease in purchasing power (Nigeria, Prof. John C. Imegi1, Dr. Marshal Iwedi2 & Chiwuba Anthony Nnaji3, 2023).

The exchange rate has an inverse relationship with capital structure due to market frictions, providing policy recommendations to governments in emerging economies to absorb real exchange rate volatility shocks. The effect is measured by the persistence of the rate in the emerging economy, as a measure of financial fragility. The volatility of the real exchange rate forces a company to use internal funds rather than increase leverage during a financial crisis. According to the Pecking Order Theory, the volatility of the real exchange rate. The management's capital flow methods identify destabilizing movements in the exchange rate. The capital flow with macroprudential methods reduces the development of vulnerabilities at the local level by enforcing rules and regulations and controlling capital.

The relationship is negative because the market faced friction, with firms facing high uncertainty in the financial market. Companies in a currency-mismatch situation faced exchange rate fluctuations due to the short-term real interest rate, resulting in an increase in the risk premium. The firm used internal funds to run the business rather than relying on debt or external financing, and demand for the firm decreased in the market because the capital structure is set up for low risk. option. Macro prudential policies are implemented to improve the quality of institutions in the market, as part of corporate governance, through regulatory frameworks.

The Tobin tax, as a new subsidy, was designed by the government to reduce exposure, volume, and the number of transactions based on the exchange rate, thereby reducing financial friction or encouraging companies to offer more to the public. (Al-Jassar and Moosa, 2020) An increase in volatility results from currency overvaluation. (Kahn, 2015 Capital structure is affected by the exchange rate. (Khetsi and Mongale, 2015). Overvaluation of the exchange rate causes currency depreciation due to exchange rate volatility. A person will invest the assets in other options to avoid a capital loss.

Hypotheses

H1: Capital structure is positively and significantly related to size.

H2: Capital structure is positively and significantly related to current assets.

H3: Capital structure has a positive relationship with Inflation.

H4: Capital structure is negatively related to exchange.

METHODOLOGY

The quantitative data on firm-level variables were obtained from the Wall Street Journal website. The macroeconomic data were collected from the World Bank's World Development Indicators (WDI, 2025) website. Imbalanced panel data are used to study the determinants of capital sericulture (Faccio & Xu, 2015).

The data period is 2010-2023, covering 87 firms involved in outer space exploration and tourism, yielding a sample of 416 observations. Data is imbalanced; therefore, the FGLS model is used (Ganganwar, V., 2012) in STATA software version 17.

Variables	Indicators	
Dependent Variables	**Measure of Variables**	**Data Source**
Capital Structure (CAP)	Debt / Equity	Annual data gathered from the Wall Street Journal Website and the authors' calculation
Independent Variables		
Firm-Specific Variables		
Return on equity (ROE)	The proxy is used to assess a business's profitability.	Data calculated on an annual basis from data collected from the Wall Street Journal Website
Size (SIZE)	Calculated as the logarithm of total assets.	Data calculated on an annual basis from data collected from the Wall Street Journal Website
Current Assets (CAS)	Current assets	Data calculated on an annual basis from data collected from the Wall Street Journal Website
Macroeconomic Variables		
Inflation (INF)	The consumer price index is calculated as a percentage.	World Bank (WB) World Development Indicators (WDI) data source.
Gross domestic product (GDPLAG1)	The quantity of growth is the annual increase in real gross domestic product.	World Bank (WB) World Development Indicators (WDI) data source.
Exchange rate (EXR)	This indicator represents the ratio of Local Currency Units relative to United States dollars.	World Bank (WB) World Development Indicators (WDI) data source.

The empirical model is given as:

$$\mathrm{CAP}_{it} = \beta_0 + \beta_1 \mathrm{ROE}_{it} + \beta_2 \mathrm{SIZE}_{it} + \beta_3 \mathrm{CAS}_{it} + \beta_4 \mathrm{INF}_{it} + \beta_5 \mathrm{GDPLAG1}_{it} + \beta_6 \mathrm{EXR}_{it} + \varepsilon_{it}.$$

Here, i denotes cross-sectional (= 1, 2, ..., 87); t represents time series data, and the error term is shown with ε. GLS or Feasible Generalized Least Squares FGLS which is feasible generalized least squares and corrected standard error. Problems such as autocorrelation, heterogeneity, and cross-sectional dependence arise when errors are highly dependent but not correlated, leading to biased estimates. The estimation result is not robust. Take the GLS and consider multicollinearity, autocorrelation, residence, and the cross-section dependence.

It's a statistical method used in regression analysis, particularly when dealing with non-spherical errors (i.e., heteroskedasticity or autocorrelation). FGLS is a practical approach to generalized least squares (GLS) because it estimates the error covariance matrix, which is typically unknown in real-world datasets. GLS is a technique that improves upon ordinary least squares (OLS) when in regression the error term is correlated or has non-constant variance (heteroskedasticity). The error terms are considered non-spherical, and OLS estimates can be inefficient or biased. FGLS estimates the covariance matrix of the error terms and then, using this estimate, transforms the data and applies GLS.

In many real-world scenarios, the exact form of the covariance matrix is unknown. FGLS addresses this by using an estimate of the covariance matrix, making it a practical approach. FGLS provides more efficient and reliable estimates than OLS when dealing with non-spherical errors, and it can be robust to certain types of model misspecification. FGLS is often used in panel data analysis, where observations are collected over time for the same individuals or entities. While OLS assigns equal weight to all observations, FGLS and GLS account for the variability and correlation of the error terms, potentially yielding more accurate results.

RESULTS

Table 2 summarizes the variables for space exploration and space travel companies.

Table 2 *Descriptive Statistics*

Variable	Obs	Mean	Std. Dev.	Min	Max
Cap	415	2.679	36.121	-6.726	718.163
Roe	416	6.995	46.22	-650.074	285.339
Size	411	4.286	1.087	.903	6.891
Cas	127	44907.964	174225.51	20.23	1001614
Inf	408	3.348	2.371	-1.139	8.549
Gdplag1	407	12.026	2.951	-.727	13.437
Exr	408	81.814	261.109	.727	1305.66

415 observations for CAP, at a mean value of 2.679 and a standard deviation of 36.121, the minimum value is -6.726, and the maximum value is 718.163. There are 416 observations for ROE, with a mean of about 6.995 and a standard deviation of 46.220; the minimum value is negative at 650.074, and the maximum value is 285.339, which differs substantially from the mean. The size of the 87 firms involved in space exploration has 411 observations, with a mean of 4.286, a standard deviation of 1.087, a minimum of 0.903, and a maximum of 6.891. CAS has 127 observations due to missing data for some firms and years, with a mean of 44907.964, a standard deviation of 174225.51, a minimum value of 20.23, and a maximum value of 1001614.

Macroeconomic variable, INF has 408 observations, with a mean value of 3.348 and a standard deviation of 2.371, a negative minimum value of 1.139, and a higher maximum value of 8.549., GDPLAG1 was calculated with a one-year lag and showed 407 observations, a mean of 12.026, a standard deviation of 2.951, a very low minimum of -0.727, and a maximum of 13.437. EXR has 408 observations (some countries did not declare the rate), with a mean of 81.814, a standard deviation of 261.109, a minimum of 0.727, and a maximum of 1305.660.

Table 3 *Matrix of correlations*

Variables	(CAP)	(ROE)	(SIZE)	(CAS)	(INF)	(GDPLAG1)	(EXR)
CAP	1.000						
ROE	-0.030	1.000					
SIZE	0.219*	-0.112*	1.000				
CAS	0.005*	-0.055	0.702*	1.000			
INF	0.164*	-0.055*	0.056*	0.080*	1.000		
GDPLAG1	-0.036	0.028*	0.071*	0.090*	0.014*	1.000	
EXR	-0.043*	-0.051	0.189*	-0.000	0.037*	-0.064	1.000

The highest correlation is between CAS and SIZE at 70%, which is significant (below 80%) and indicates no multicollinearity in the data, as stated by Gujarati (2009). There is a 3% negative correlation between CAP and ROE. Similarly, there is a positive significant correlation between SIZE and CAP at 21%; between CAP and CAS, there is a significant correlation at about 0.5%; between CAP and INF, there is a significant correlation at 1.6%; and between CAP and GDPLAG1, there is a negative correlation at 3.6%. EXR has a negative and significant correlation with CAP at 4.3%, EXR has a negative correlation with ROE at 5.1%, EXR has a positive and significant correlation with SIZE at 18.9%, EXR has a negative correlation with CAS at 0%, EXR has a positive correlation with INF at 3.7%, and EXR has a negative correlation with GDPLAG1 at 6.4%. SIZE has a negative and significant correlation with ROE at 11.2%, CAS and ROE at -5.5%, INF is significantly correlated at -0.55% with ROE, and GDPLAG1 is significantly correlated at 2.8% with ROE.

However, a positive, significant correlation is observed between INF and SIZE, with a correlation coefficient of 5.6%. GDPLAG1 and SIZE are correlated, significant at the 7.1% level. EXR has a positive and significant correlation with SIZE at 18.9%; INF is positively and significantly correlated with CAS and GDPLAG1; CAS has a significant and positive correlation at 9.0%. GDPLAG1 and INF are significantly and positively correlated at 1.4%. GDPLAG1 and EXR are significantly and positively correlated at 3.7%.

Table 4. *Linear Regression*

CAP	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ROE	.001	.011	0.10	.921	-.021	.023	
SIZE	5.159	1.341	3.85	0	2.503	7.816	***
CAS	0	0	-2.79	.006	0	0	***
INF	.792	.398	1.99	.049	.004	1.58	**
GDPLAG1	-.122	.205	-0.60	.552	-.527	.283	
EXR	-.012	.007	-1.61	.111	-.027	.003	
Constant	-15.087	4.925	-3.06	.003	-24.841	-5.333	***

Mean dependent var	**1.662**	**SD dependent var**	**10.112**
R-squared	0.139	Number of obs	125.000
F-test	3.187	Prob > F	0.006
Akaike crit. (AIC)	927.393	Bayesian crit. (BIC)	947.191

*** p<.01, ** p<.05, * p<.1

Table 5 *Cross-sectional time-series FGLS regression*

CAP	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
ROE	.001	.011	0.10	.919	-.02	.023	
SIZE	5.159	1.303	3.96	0	2.605	7.714	***
CAS	.0000197	0	2.87	.004	0	0	***
INF	.792	.387	2.05	.041	.034	1.55	**
GDPLAG1	-.122	.199	-0.61	.539	-.512	.268	
EXR	-.012	.007	-1.65	.098	-.026	.002	*
Constant	-15.087	4.786	-3.15	.002	-24.466	-5.707	***

Mean dependent var	1.662	SD dependent var	10.112
Number of obs	125.000	Chi-square	20.258
Prob > chi2	1.000	Akaike crit. (AIC)	927.393

*** p<.01, ** p<.05, * p<.1

Tables 4 and 5 show the function of CAP with three firm-level and three macroeconomic variables. Variables of data. Table 4 reports the OLS regression, and Table 6 reports a robustness check using the FGLS model. Table 4 and 5 shows that CAP is positively and significantly related to SIZE with 1% significance at 0.000, size is measured as the log of total assets, the volatility of cashflow is low in big firms, thus the credit risk is reduced, an ease to access to credit is increased, size reduce bankruptcy risk as mentioned in Trade-Off theory (Pedro Luis Vega-Gutiérrez, Félix J. López-Iturriaga & Juan Antonio Rodríguez-Sanz 2025).

Current assets are positively related to capital structure, with significance levels of 5% at 0.006 and 0.004 for OLS and FGLS, respectively (An et al., 2015). Firms with more tangible assets utilize more leverage. Banks with sufficient capital can adjust to reduced cash flow and wait until asset issues are resolved. Therefore, more capital can lead to more asset defaults before the firm becomes insolvent. Inflation has a positive relationship with capital structure, with significance levels of 5% at 0.049 and 0.041 for OLS and FGLS, respectively, Egbunike et al., 2018. Companies borrow funds from banks at low interest rates to raise debt capital and maintain a low capital structure ratio, influenced by macroeconomic factors such as inflation (Çam and Özer, 2022; Khemiri and Noubbigh, 2018).

Low debt utilization due to lenders' reluctance to lend when inflation is high, and business lending becomes risky. The exchange rate is negatively related to capital structure, with a 10% significance level of 0.098 using FGLS. Exchange causes the firms to use the internal funds according to the Pecking Order theory. The real exchange rate adversely affects credit availability, acting as a mediator between cash flow and leverage.

Hypotheses of this study

H1: Capital structure is positively and significantly related to size has been accepted in correlation and regression analysis. In correlation analysis, there is a positive correlation between SIZE and CAP at 21%*. In regression analysis, it is proven that there is a significant positive relationship between CAP and SIZE. With the indication that as the size of the firm increases, its capital structure also increases, and vice versa.

H2: Capital structure is positively and significantly related to current assets, as accepted in the correlation and regression analyses. In the correlation analysis, CAP is positively correlated with CAS and is significant, with a magnitude of 0.5%. In regression analysis, it has been shown that there is a significant relationship between CAP and CAS. This indicates current rate increase will increase the capital structure.

H3: Capital structure is positively related to inflation, as supported by correlation and regression analyses. In the correlation analysis, CAP is positively correlated with INF and is significant, with a magnitude of 1.6%. In regression analysis, a significant relationship between CAP and INF has been shown. This indicates that an inflation increase will increase the capital structure.

H4: Capital structure has a negative relationship with exchange has been accepted in correlation and regression analysis. In the correlation analysis, CAP is negatively correlated with EXR and is significant, with a magnitude of 3.6%. In regression analysis, a significant relationship between CAP and EXR has been shown. This indicates that an increase in the exchange rate will decrease the capital structure.

DISCUSSION AND POLICY IMPLICATIONS

The study examined the determinants of capital structure in 87 space tourism and space exploration companies worldwide, using imbalanced panel data estimated with the FGLS model from 2010 to 2023, as firms began investing in space exploration and tourism. Inflation with fluctuations had a positive relationship with capital structure, leading to lower debt utilization, as lenders are hesitant to lend when the inflation rate rises and risk increases. Excessive exchange rates harm the profits of firms involved in space tourism and space exploration. As the exchange rate difference is significant, it can cause companies to utilize internal funds in accordance with the pecking order theory. it helps the government to control the exchange rate and ultimately improve capital structure

The empirical output proves that for companies, a higher size value helps maximize capital structure, facilitates a smooth flow of cash, does not create credit risk, and decreases bankruptcy risk, as per the trade-off theory. The return on equity is not significant for space exploration and tourism companies. Although the ratio helps in capital structure, and GDP taken at a lag is not enough to support a company involved in the space business. The current asset for capital structure, as suggested by De George et al. (2016) and consistent with the trade-off theory, originally, asset growth helps build leverage by funding the business and increases investment opportunities by issuing shares.

CONCLUSION

The study explores space tourism and exploration in the context of capital structure, with the company's size and current assets as key factors. Additionally, in the macroeconomic environment of variables such as inflation and exchange rates, to further enhance the inclusive analysis. The data are imbalanced panel data, as firms' start and business wind-up dates range from 2010 to 2023. The FGLS model was run on STATA 17 for analysis.

The findings reveal that the size of the firms involved in space exploration and space tourism has a positive impact on the capital structure. As the firm's size increases by 1%, capital formation increases by 21%, in the form of debt and equity. Similarly, the study indicates that current assets significantly affect capital structure. As current assets increase by 1%, debt and equity capital increase by 0.5%. As the company has a high flow of assets, it can invest more funds in leveraged activity as dividends. The study also shows that a 1% increase in the inflation rate may increase capital structure by 1.6%. Companies have the advantage of borrowing at lower interest rates, as households prefer to save during periods of price hikes. The results conclude that a 1% increase in the exchange rate leads to a 3.6% decrease in capital structure, as firms use internal funds to invest in projects rather than borrow from the economy. The results are in alignment to the initial expectation. Therefore, the government implemented favorable policies to create a friendly environment for businesses to build their capital structures. The framework should be built on legal and financial facilities to make firms confident in using capital and attract local and foreign investors. The study highlights the significance of effective policies for maintaining the firm's size and assets amid inflation and exchange rate fluctuations in the construction of its capital structure. In the event of failure, the firm and the government may not be able to achieve the joint goal of accessible space exploration and space travel. That is only possible with a healthy capital structure to attract investors and tourists to space travel. Better technologies increase employment chances and generate funds for further savings. The framework identified trade-offs among funding sources (internal vs. external) and firm-specific traits (e.g., firm size) as well as tangible assets. The research affirms that the Trade-Off theory can be applied to industries in the space travel and space exploration sector, utilizing the models to inform the financing strategy.

Limitations

The main coverage of this sample is limited to using privately held firm-level data in the sector.

The study’s limitation lies in its focus on historical data from 1964 space missions, which may be less relevant to current contexts of the digital and latest technologies.

RECOMMENDATIONS

The main recommendations are to prioritize laws that protect the investors and political stability in the country. The advanced infrastructure of building space stations, space ships, and software to launch a rocket and a safe landing back on Earth. Recommendations included exchange rate stabilization policies to enhance the stability and growth of the manufacturing sector. Further studies would use case studies or fieldwork to examine the effects of macroeconomic conditions on corporate capital structure in greater detail.

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