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A Global Analysis of the COVID-19 Pandemic and Capital Structure in the Consumer Goods Sector

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Abstract: Understanding a company's capital structure is essential for optimizing financial resources amid the challenges posed by the COVID-19 pandemic. This research examines how the pandemic affected the capital structures of global consumer goods companies across industries, market types, and regions. In this study, a fixed effects model was employed to analyze panel-data regression data spanning from 2018 to 2022, encompassing 1491 companies across 80 countries. The results revealed a significant and positive impact of COVID-19 on capital structure in the initial two years, contrasting with a negative trend in the third year, notably in the short-term debt to total assets ratio. The pandemic's influence on the capital structure varied across sectors, markets, and regions, starting with a consistent positive impact before shifting to a negative and significant effect. The study provides valuable insights for businesses, policymakers, and researchers grappling with the financial implications of external shocks like the pandemic. It underscores the importance of prudent financial decision-making, leveraging the opportunities stemming from a conservative debt approach, and the growing reliance on short-term debt while staying adaptable in response to evolving market dynamics and economic changes.

Keywords: COVID-19; capital structure; consumer goods sector

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1. Introduction

The outbreak of the COVID-19 pandemic in late 2019 brought the world to a standstill, affecting nearly every facet of human life and global economic systems. As nations grappled with the public health crisis, the virus's economic repercussions soon became evident. There were many sectors affected by the COVID-19 pandemic, such as the creative industry (Achmad et al. 2023), small and medium enterprises (Lestari et al. 2022; Zainurossalamia et al. 2022; Riadi et al. 2022a), the financial industry (Maria et al. 2022; Riadi et al. 2022b; Yudaruddin 2023a, 2023b), and the manufacturing industry (Ulfah et al. 2022). According to Gonzalez and Sorescu (2020), the COVID-19 pandemic has resulted in the enforcement of physical distancing and confinement measures, which has caused a shift of many offline activities to the online realm. During the same period, however, container trade in select ports around the world experienced a sharp decline, initially falling by approximately 10% and remaining 5% lower on an annual basis by April 2020. This downward trend was anticipated to continue due to a 15–18% drop in global demand during the second quarter. Baldwin and Mauro (2020) noted that the implementation of COVID-19's social restrictions has led to a decrease in global productivity. Moreover, Fernandes (2020) indicated that GDP growth forecasts could decline by as much as 3–5%, albeit with country-specific variations.

One of the critical dimensions of this impact was the transformation it imposed on corporate finance, particularly in terms of capital structure. The relevance of studying the global implications of COVID-19 on capital structure is underscored by the unprecedented nature of this crisis and its widespread influence across industries, markets, and regions.

Theoretical frameworks in corporate finance have long guided our understanding of capital structure decisions. The works of Modigliani and Miller (1958), the Trade-Off Theory (Modigliani and Miller 1963), and the Pecking Order Theory (Myers and Majluf 1984) have provided valuable insights into how companies navigate the delicate balance between debt and equity. However, the COVID-19 pandemic has presented a unique and multifaceted challenge to these established theories, prompting the need for a global examination of its impact. As discussed in the literature review, previous financial crises have indeed influenced capital structures, but the scale and scope of COVID-19's effects make it an exceptional case.

Studies, such as those conducted by Duran and Stephen (2020), Ghosh (2018), and Zeitun et al. (2017), have shown how crises, such as the 2008 financial crisis, changed the capital structure of companies and financial institutions. These findings underscore the importance of understanding how external shocks influence financial decisions. Meanwhile, Faturohman and Noviandy (2022), Prakash et al. (2023), and Vo et al. (2022) showed the intricacies of capital structure adjustments in the midst of a pandemic. However, studies of the broader impact of the COVID-19 pandemic, affecting various industries, market types, and global regions, have not yet been studied. Therefore, a study emphasizing the need for a comprehensive global analysis to capture the entire spectrum of changes in a company's financing strategy should be carried out.

In light of these considerations, this study endeavors to explore the profound implications of the COVID-19 pandemic on the capital structure of companies within the global consumer goods sector. By examining a dataset comprising 1491 companies across 80 countries from 2018 to 2022, we seek to provide a comprehensive and nuanced understanding of how companies, across industries, market types, and global regions, adapted their capital structures in response to the pandemic's challenges. This research holds significance not only for academics seeking to advance our knowledge of corporate finance in times of crisis but also for managers and policymakers navigating their organizations through an ever-evolving economic landscape.

In this study, we provide several significant contributions to the existing literature. Firstly, our research uniquely focuses on the impact of the COVID-19 pandemic on the capital structure of companies within the global consumer goods sector. To the best of our knowledge, no prior study has delved into this specific area, highlighting the novelty of our research. Whereas earlier research has explored the effects of COVID-19 on capital structures, these have often concentrated on broader industries or market types, missing the nuanced dynamics of the consumer goods sector (Alrwashdeh et al. 2023; Faturohman and Noviandy 2022; Gopalakrishnan et al. 2022; Haque and Varghese 2023; Kim 2023; Nguyen et al. 2023; Prakash et al. 2023; Vo et al. 2022).

Secondly, we advance the literature by providing comprehensive insights into the pandemic's influence on capital structure by dissecting our sample into various dimensions. By categorizing companies based on industries (such as Alcoholic Beverages/Drinks, Food Products, Non-Alcoholic Beverages/Drinks, and Tobacco), market types (encompassing Developed Markets, Emerging Markets, Frontier, and Standalone Markets), and diverse global regions (spanning the Americas, Europe, Middle East, Africa, and Asia and the Pacific), we offer a detailed and nuanced understanding of how different contextual factors interact with the pandemic's effects on capital structure. This approach enhances the applicability of our findings across a wide spectrum of companies operating under distinct conditions.

Thirdly, our study uniquely investigates the temporal aspects of the pandemic's impact by examining the first, second, and third years of the COVID-19 pandemic. This temporal analysis provides a comprehensive view of how capital structure adjustments evolved over time in response to the crisis. It underscores the dynamic nature of corporate finance

decisions during a prolonged period of uncertainty, offering valuable insights for both academics and practitioners seeking to understand and navigate the financial challenges posed by external shocks like the pandemic.

Lastly, our research contributes by empirically demonstrating the significant and evolving impacts of the COVID-19 pandemic on capital structures. We provide evidence that the pandemic initially prompted companies to adopt more conservative financial strategies, leading to a reduction in long-term debt levels as they aimed to mitigate financial risks in times of uncertainty. However, as economies transitioned toward a "new normal" and businesses adapted to changing circumstances, we observed a shift in capital structure dynamics, particularly an increased reliance on short-term debt. This highlights the adaptability of companies in response to evolving economic conditions.

This research holds paramount importance both in the realm of academic research and practical application. From an academic standpoint, the study sheds light on the intricate dynamics of the COVID-19 pandemic's impact on the capital structure of companies within the global consumer goods sector, providing a comprehensive understanding of how this unprecedented crisis has shaped corporate finance strategies. By delving into the temporal aspects and dissecting the sample across industries, market types, and global regions, the research contributes to advancing our theoretical understanding of how companies respond to external shocks. Moreover, the empirical demonstration of the evolving impacts of the pandemic on capital structures emphasizes the dynamic nature of corporate financial decisions, thereby enriching the existing literature on crisis-induced transformations in financial strategies. From a practical perspective, the findings offer valuable insights for industry practitioners and policymakers grappling with the challenges imposed by the pandemic. The nuanced understanding of how companies adjusted their capital structures over time in response to the crisis provides crucial guidance for managers navigating their organizations through uncertain economic landscapes. The identification of the initial shift toward conservative financial strategies and the subsequent adaptation to short-term debt reliance serves as a practical reference point for companies seeking to optimize their financial resilience and adaptability in the face of ongoing market fluctuations and economic uncertainties.

2. Literature Review

2.1. Theoretical Framework

The principles of capital structure theories have been put to the test by the COVID-19 pandemic. Companies have been compelled to meticulously evaluate their financing alternatives, taking into account the potential advantages derived from tax benefits, the associated risks of leveraging, and the inclination toward utilizing internal funds due to information asymmetries. The capital structure of companies has been substantially influenced by the COVID-19 pandemic, and its ramifications can be comprehended by examining various financial theories, such as Modigliani and Miller's Propositions, the Trade-Off Theory, and the Pecking Order Theory.

Modigliani and Miller (1963) analyzed the role of indebtedness in a company's capital structure, particularly in terms of its tax advantages. They argued that interest payments on debt are deductible from income taxes, making debt financing attractive from a tax perspective. However, their work also highlighted that companies should not indiscriminately increase their debt levels. This is crucial to understanding the impact of COVID-19. During the pandemic, many companies faced financial challenges due to reduced revenues and disruptions in their operations. To navigate this crisis, some turned to debt financing to raise immediate capital. The tax advantage of debt became more pronounced during this period as companies sought ways to mitigate their tax liabilities, especially when profits were dwindling. However, this does not mean that companies should have excessively leveraged themselves. The decision to take on debt must consider not only tax benefits but also other factors, such as bankruptcy costs, agency problems, and the overall financial health of the company.

The Trade-Off Theory extends the understanding of capital structure by considering a broader set of factors, including taxes, bankruptcy costs, and agency problems (Modigliani and Miller 1963). It suggests that an optimal capital structure exists that balances the benefits of debt (such as tax savings) with the costs of financial distress. In this framework, leverage is seen as advantageous under certain conditions, even if a company has internal funds available. During the COVID-19 pandemic, the Trade-Off Theory would predict that companies might have leaned toward debt financing as a way to tap into the tax benefits and to manage their financial difficulties. However, this theory also emphasizes the importance of not overleveraging, as it acknowledges that as debt levels increase, so does the risk of default. Thus, the decision to take on debt during the pandemic should have been a well-calibrated one, considering the balance between tax savings and the increased risk of financial distress.

The Pecking Order (PO) Theory, proposed by Myers (1984) and Myers and Majluf (1984), introduces the concept of a hierarchical order in financing choices, primarily driven by asymmetric information between lenders and companies. According to this theory, companies prefer to use internal funds (such as retained earnings) first to finance their operations, as these funds do not entail the adverse selection problems associated with external financing. COVID-19 disrupted many businesses, leading to a need for additional capital. In line with the Pecking Order Theory, companies might have initially turned to their internal funds or retained earnings to meet their financial needs during the pandemic. This preference for internal financing could be attributed to the uncertainty and increased monitoring costs associated with external financing during a crisis. As internal funds were depleted, companies might have considered debt financing and, as a last resort, equity financing through the stock market. The Pecking Order Theory underscores the importance of preserving financial flexibility during times of uncertainty, such as the COVID-19 pandemic, and leveraging internal resources before resorting to external financing.

2.2. COVID-19 and Capital Structure

Several studies have unveiled the diverse impacts of various financial crises on the capital structure of companies and financial institutions across different regions and industries (Duran and Stephen 2020; González 2015; Zeitun et al. 2017; Ghosh 2018; Yazdanfar et al. 2019; Khalfan and Wendt 2020; Akbar et al. 2013; Deesomsak et al. 2004; Duchin et al. 2010; Ariff et al. 2008). One central theme throughout these studies is the profound influence of financial crises on the capital structures of these entities. For instance, Duran and Stephen (2020) underscored the aftermath of the 2008 financial crisis on Latin American multinational corporations. These corporations notably exhibited heightened debt levels following the crisis, reflecting how such economic shocks can reshape their capital composition. González (2015) delved into the implications of external factors and banking structures during crises, leading to a significant reduction in debt maturity, particularly for those dependent on external financing.

Moreover, Zeitun et al. (2017) shed light on Gulf Cooperation Council (GCC) countries, where the scarcity of available debt due to the crisis resulted in decreased debt ratios. The transformative impact of crises was further exemplified by Ghosh (2018), challenging conventional notions of bank capital structure and revealing substantial shifts in the wake of the crisis, especially among Islamic banks. Yazdanfar et al. (2019) underscored how the 2008 crisis triggered a pronounced reliance on both short-term and long-term debt by small- and medium-sized enterprises (SMEs) in Sweden. The dynamics of crises were vividly captured by Khalfan and Wendt (2020), emphasizing the unconventional positive correlation between internally generated funds and leverage during crisis periods in Icelandic firms. Similarly, Akbar et al. (2013) and Deesomsak et al.)2004) explored how external factors amplify during crises, influencing the capital structures of firms in the Asia-Pacific and the UK. Duchin et al. (2010) provided a poignant insight into the enduring repercussions of negative supply shocks, constraining the investment decisions of public firms in the United States.

Ariff et al. (2008) illustrated the gradual adjustment toward an optimal capital structure in Malaysian companies after the 1997 Asian crisis, highlighting the lasting effects of crises.

The extensive ramifications of crises were further reaffirmed by Demirgüç-Kunt et al. (2020), with comprehensive findings elucidating the widespread reduction in debt ratios and maturity, particularly impacting non-listed entities and SMEs. The sustained consequences of credit scarcity during crises on growth opportunities were highlighted by Campello et al. (2010). Moradi and Paulet (2019) demonstrated the intricate correlations between numerous factors and the capital structures of companies across European countries during crisis periods. Iqbal and Kume (2014) portrayed the oscillations in debt ratios amid the 2008 crisis in the UK, France, and Germany, revealing nuanced responses among firms with varying leverage levels. Lastly, Harrison and Wisnu Widjaja (2014) underscored the substantial shift in the influence of tangibility and profitability on capital structures within S&P 500 index companies after the 2008 crisis. Aybar et al. (2023) unveiled the distinctive changes in capital structure decisions within emerging markets during the 2007–2008 financial crisis, portraying an intricate pattern of equity and debt adjustments. Altogether, these studies meticulously illustrate how financial crises reverberate through entities' capital structures, reshaping their financial landscapes in profound and intricate ways.

Regarding the COVID-19, extensive research has been conducted to understand how the COVID-19 pandemic has influenced the financial structures of companies across various industries and regions. These studies have shed light on the intricate relationship between external shocks like a global pandemic and a company's capital structure choices (Prakash et al. 2023; Faturohman and Noviandy 2022; Nguyen et al. 2023; Vo et al. 2022; Haque and Varghese 2023; Gopalakrishnan et al. 2022). In this discussion, we explore several key studies that have examined the impact of COVID-19 on the capital structures of firms in different sectors and geographical locations. These studies offer valuable insights into the strategic decisions made by businesses during times of unprecedented uncertainty.

The study conducted by Prakash et al. (2023) investigated the repercussions of the COVID-19 pandemic on the capital structures of companies listed on the Bombay Stock Exchange (BSE) between 2015 and 2021. Their findings pointed out a significant negative impact on long-term leverage ratios. However, the short-term and total leverage ratios appeared statistically unaffected. This implies that companies in culturally risk-averse contexts, like India, tend to reduce long-term debt levels during uncertain times to mitigate bankruptcy risks.

In contrast, Faturohman and Noviandy (2022) found substantial positive correlations between asset tangibility, tax shield, earnings volatility, and book leverage. They also noted positive associations between tax shield and earnings volatility with the debt-to-equity ratio. Nevertheless, no statistically significant correlation emerged between capital structure and the pandemic variable. These results suggest that the pandemic had no discernible effect on capital structure during their research period. Nguyen et al. (2023) explored a dataset of 196 hotels across 30 countries, discovering that hotels with lower debt capital structures demonstrated greater financial resilience during the pandemic. This was particularly evident when facing government-imposed travel restrictions. The advantages of lower debt levels were most notable for smaller, less diversified, and slower-growing establishments. Hotels with less long-term debt also displayed greater stability during the pandemic.

Vo et al. (2022) used a global sample of publicly traded companies and observed that firms were more responsive in adjusting their capital structures in the immediate aftermath of the COVID-19 pandemic. Additionally, firms in countries heavily impacted by COVID-19 adjusted their target leverage more rapidly. In a recent study by Haque and Varghese (2023), firms exposed to rollover risk and aggregate shocks increased their leverage significantly, especially when regulatory authorities provided liquidity assistance. This aligns with the standard Trade-Off Theory, as equity-holders appeared willing to accept a higher default risk if operational cash flows exceeded those in bankruptcy. Gopalakrishnan et al. (2022) analyzed data from 61 countries to show that firms more exposed to pandemics and stricter

lockdowns sought more debt, reflecting a demand for precautionary measures. Companies in industries less conducive to remote work also sought increased debt but faced higher financing costs. Firms with optimistic investment motives were more likely to secure loans, indicating opportunistic behavior.

Alrwashdeh et al. (2023) studied the impact of cash flow components on the capital structure of pharmaceutical companies listed on the Amman Stock Exchange from 2018 to 2021, also examining the influence of the COVID-19 pandemic. Alp et al. (1862) investigated non-financial firms listed on Borsa İstanbul, finding that highly impacted sectors saw increased leverage, while less affected sectors remained more stable. Lastly, Kim (2023) studied small and medium enterprises in Vietnam from 2010 to 2020 and found that COVID-19 significantly influenced their capital structures, aligning with signaling theory and previous research grounded in Agency Theory, Pecking Order Theory, and Trade-Off Theory.

H1: *COVID-19 has a significant positive impact on leverage.*

H2: *COVID-19 has a significant positive impact on short-term leverage.*

H3: *COVID-19 has a significant positive impact on long-term leverage.*

3. Methodology

The objective of this research was to examine the effects of the COVID-19 pandemic on the capital structure of companies operating in the consumer goods sector worldwide. This was assessed by analyzing the ratios of total debt to total assets, short-term debt to total assets, and long-term debt to total assets. Moreover, this research investigated the influence of the COVID-19 pandemic on capital structure by industries (Alcoholic Beverages/Drinks, Food Products, Non-Alcoholic Beverages/Drinks, Tobacco), markets (Developed Markets, Emerging Markets, Frontier and Standalone Markets), and regions (Americas, Europe, Middle East, Africa, and Asia and the Pacific). The financial statements used in this study were obtained from the Wall Street Journal Database (WSJ) and covered the period from 2018 to 2022. An analysis was conducted on a dataset comprising 1491 companies from 80 countries, examining both dependent and independent variables. The subsequent information illustrates the distribution of the sample (Table 1).

Table 1. Distribution of sample firms by country.

Country	Num. of Comp	%	Country	Num. of Comp	%	Country	Num. of Comp	%
Argentina	8	0.54	Israel	11	0.74	Qatar	4	0.27
Australia	32	2.15	Italy	9	0.6	Saudi Arabia	9	0.6
Austria	4	0.27	Ivory Coast	4	0.27	Serbia	1	0.07
Bahrain	1	0.07	Jamaica	4	0.27	Singapore	18	1.21
Bangladesh	13	0.87	Japan	127	8.52	South Africa	10	0.67
Belgium	6	0.4	Jordan	3	0.2	South Korea	82	5.5
Bulgaria	1	0.07	Kazakhstan	2	0.13	Spain	4	0.27
Canada	45	3.02	Kenya	4	0.27	Sri Lanka	15	1.01
Chile	8	0.54	Kuwait	1	0.07	Sweden	16	1.07
China	151	10.1	Latvia	1	0.07	Switzerland	10	0.67
Croatia	7	0.47	Lithuania	4	0.27	Taiwan	34	2.28
Cyprus	2	0.13	Malaysia	33	2.21	Tanzania	1	0.07
Thailand	53	3.55	Malta	1	0.07	Czech Republic	2	0.13
Denmark	5	0.34	Morocco	4	0.27	United States	152	10.19
Egypt	17	1.14	Mauritius	6	0.4	Tunisia	4	0.27
Estonia	2	0.13	Mexico	9	0.6	Turkey	31	2.08
Finland	5	0.34	Namibia	1	0.07	UEA	1	0.07
France	18	1.21	Netherlands	5	0.34	United Kingdom	41	2.75
Germany	16	1.07	New Zealand	7	0.47	Venezuela	1	0.07

Table 1. *Cont.*

Country	Num. of Comp	%	Country	Num. of Comp	%	Country	Num. of Comp	%
Ghana	4	0.27	Nigeria	17	1.14	Vietnam	36	2.41
Hong Kong	70	4.69	Norway	2	0.13	Zambia	4	0.27
Hungary	2	0.13	Oman	1	0.07	Zimbabwe	4	0.27
Iceland	1	0.07	Pakistan	31	2.08	Colombia	2	0.13
India	143	9.59	Palestine	3	0.2	Greece	7	0.47
Indonesia	48	3.22	Peru	8	0.54	Trinidad & Tobago	4	0.27
Iraq	1	0.07	Philippines	18	1.21			
Ireland	3	0.2	Poland	16	1.07			

Source: Authors' calculation.

Following Alrwashdeh et al. (2023), Faturohman and Noviandy (2022), and Prakash et al. (2023), the dependent variable used was capital structure as measured by total debt to total assets, short-term debt to total assets, and long-term debt to total assets of the consumer goods sector. The Debt to Asset Ratio (TDTA, SDTA, and LDTA) is a debt ratio used to measure the ratio between total debt and total assets. In other words, this ratio demonstrates how much of the company's assets are financed by debt or how much the company's debt has an effect on asset management.

The primary independent variable of interest is the COVID-19 pandemic, which was measured using a dummy variable. This dummy variable had a value of 1 during the first years of the COVID-19 pandemic (2020–2022) and a value of 0 otherwise. The analysis also included company-specific variables such as profitability, company size, cash holding, liquidity, and tangibility. Table 2 provides more detailed information on the measurement of these variables.

Table 2. Dependent, independent, and control variables.

Variables	Abbreviation	Definition and Measure	Expected Sign
Dependent Variables			
Capital Structure	TDTA	Total debt to total asset	
	SDTA	Short-term debt to total assets	
	LDTA	Long-term debt to total assets	
Independent Variable			
COVID-19	COV	This dummy variable has a value of 1 if the year of the COVID-19 pandemic (2020–2022), or 0 otherwise	+
	COV20	This dummy variable has a value of 1 if the first year the COVID-19 pandemic occurred (2020), or 0 otherwise	+
	COV21	This dummy variable has the value 1 if it is the second year of the COVID-19 pandemic (2021), or 0 otherwise	+
	COV22	This dummy variable has the value 1 if it is the third year of the COVID-19 pandemic (2022), or 0 otherwise	+
Control Variables			
Profitability	ROA	Net profit/total asset	+/-
Firms Size	SIZE	Ln total_assets	-
Cash	CASH	Cash & cash equivalent to total asset	-
Liquidity	LIQ	liquid assets current liabilities	-
Tangibility	TANG	Ratio of gross block, i.e., book value of plant and machinery to total assets	-

Regarding the econometric methodology, regressions run in two stages. In the first stage, the equation of COVID-19, measured by a dummy year and a set of control variables simultaneously, is shown in Equation (1). The previous stage was repeated in the second stage, though the sample was broken down by industries (Alcoholic Beverages/Drinks, Food Products, Non-Alcoholic Beverages/Drinks, Tobacco), markets (Developed Markets, Emerging Markets, Frontier and Standalone Markets), and regions (Americas, Europe, Middle East, Africa, and Asia and the Pacific). The following model was used to predict capital structure:

$$TDTA_{i,t} = \beta_0 + \beta_1 COV_t + \beta_2 ROA_{,i,t} + \beta_3 SIZE_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LIQ_{i,t} + \beta_6 TANG_{i,t} + \varepsilon_{i,j} \quad (1)$$

$$SDTA_{i,t} = \beta_0 + \beta_1 COV_t + \beta_2 ROA_{,i,t} + \beta_3 SIZE_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LIQ_{i,t} + \beta_6 TANG_{i,t} + \varepsilon_{i,j} \quad (2)$$

$$LDTA_{i,t} = \beta_0 + \beta_1 COV_t + \beta_2 ROA_{,i,t} + \beta_3 SIZE_{i,t} + \beta_4 CASH_{i,t} + \beta_5 LIQ_{i,t} + \beta_6 TANG_{i,t} + \varepsilon_{i,j} \quad (3)$$

where i refers to an individual firm, t refers to the year, and capital structure (TDTA, SDTA, LDTA) represents the dependent variable. The COVID-19 pandemic represents the independent variable. Meanwhile, ROA, SIZE, CASH, LIQ, and TANG represent firm-specific control variables. Also, $\varepsilon_{i,t}$ is the error terms at the firm level. The first control variable is profitability (ROA). The relationship between profitability (ROA, Return on Assets) and capital structure is complex and can vary depending on the company's situation. According to (Myers 1984), the pecking order theory posits that a financially successful firm would opt to utilize internal funds instead of external debt. There is no fixed positive or negative relationship between the two. Generally, when a company has a high level of debt in its capital structure, it can result in significant interest expenses, which can negatively impact profitability as it has to pay high interest costs. However, in some cases, the use of debt can also enhance ROA by allowing the company to allocate more funds to profit-generating investments. Conversely, companies with low debt in their capital structure may have stable ROA, but the lack of debt can limit growth potential (Alp et al. 1862; Alrwashdeh et al. 2023; Faturohman and Noviandy 2022; Kim 2023; Nguyen et al. 2023; Prakash et al. 2023; Vo et al. 2022; Yudaruddin 2017).

The second control variable is company size (SIZE). The larger a company becomes, the more likely it is to have better access to various sources of funding, including equity and debt. Consequently, larger companies possess greater flexibility in shaping their capital structure. They may be able to minimize the cost of capital by blending debt and equity as needed. However, the Pecking Order Theory suggests that as companies grow, they tend to exercise caution in their use of debt to avoid heightened financial risks. According to the Pecking Order Theory, as companies grow, they tend to prioritize internal sources of funding, such as retained earnings, over external financing options like debt issuance (Myers 1984; Myers and Majluf 1984). This is because they want to avoid the increased financial risks associated with high debt levels. Therefore, in many cases, larger companies may lean toward having a lower level of debt in their capital structure (Alrwashdeh et al. 2023; Faturohman and Noviandy 2022; Musviyanti et al. 2022; Nguyen et al. 2023; Prakash et al. 2023; Vo et al. 2022; Yudaruddin 2020).

The third control variable is cash holding (CASH). The influence of cash holdings on a company's capital structure is significant in financial management. The amount of cash a company holds can affect decisions regarding the use of debt. If a company has a substantial amount of cash on hand, they may be less inclined to rely on external debt as a source of funding, potentially leading to a lower level of debt in their capital structure (Hadjaat et al. 2021; Kusumawardani et al. 2021; Yudaruddin 2019). Conversely, if a company has limited cash reserves and requires additional capital, they may lean more on debt financing. Therefore, the level of cash holding can impact the extent of debt in a company's capital structure, with companies holding more cash tending to have lower debt levels. However, it is essential to strike an appropriate balance between having sufficient

cash for operational needs and minimizing the cost of capital (Alrwashdeh et al. 2023; Faturohman and Noviandy 2022; Nguyen et al. 2023; Prakash et al. 2023; Vo et al. 2022).

The fourth control variable is liquidity (LIQ). The influence of liquidity (LIQ) on a company's capital structure is crucial in financial management. High liquidity, indicating the possession of readily convertible assets, can provide financial security and enhance the confidence of shareholders and creditors. However, having extremely high liquidity can reduce a company's incentive to use debt in its capital structure, as they already have sufficient cash to finance operations and investment projects (Alrwashdeh et al. 2023; Amalia et al. 2022; Faturohman and Noviandy 2022; Nguyen et al. 2023; Prakash et al. 2023; Ulfah et al. 2021; Vo et al. 2022). Conversely, companies with low liquidity may tend to rely more on debt as a source of funding since they have limitations in terms of cash. Thus, liquidity levels can affect the composition of a company's capital structure, where high liquidity may result in less debt in the capital structure, and low liquidity may lead to more debt.

The last control variable is tangibility (TANG). The influence of tangibility (TANG), which refers to the extent to which a company's assets are physical or tangible, on capital structure can be significant in a company's financial decision-making. High tangibility, such as ownership of physical properties or valuable equipment, often provides collateral for creditors in case of default. Therefore, companies with high tangible assets may find it easier to secure loans and have an incentive to leverage debt in their capital structure. Conversely, companies with more intangible assets, like brands or technology, may tend to rely on equity as a source of funding because these assets cannot be used as collateral as easily (Alrwashdeh et al. 2023; Faturohman and Noviandy 2022; Kusumawardani et al. 2021; Lestari et al. 2022; Nguyen et al. 2023; Prakash et al. 2023; Vo et al. 2022). Thus, the level of tangibility can significantly influence the composition of a company's capital structure, with high tangibility tending to result in more debt in the capital structure, while low tangibility tends to lead to less debt.

Following Alrwashdeh et al. (2023), Faturohman and Noviandy (2022), Prakash et al. (2023), and Vo et al. (2022), this study adopted the panel-data regression approach. Panel data analysis extracts both cross-sectional and time-series variation from the underlying panel data and minimizes various problems, such as multicollinearity, heteroscedasticity, and estimation bias (Baltagi 2008; Wooldridge 2010). In the estimation of the regression model using panel data, three methodologies can be utilized: the Common Effect Model, the Fixed Effects Model, and the Random Effects Model. This study employed the Chow test and Hausman test to determine the most suitable regression model, ultimately selecting the fixed effects model (FEM) as the preferred choice. Using panel data, the fixed effects model produces unbiased and consistent estimates of the coefficients (Wooldridge 2010).

4. Result

Table 3 presents descriptive statistics for all variables encompassing a dataset of 7046 observations. Notably, the variable TDTA (Total Debt to Total Asset) exhibits substantial variation, with a mean of 0.90355 and a standard deviation of 1.50253, suggesting diverse capital structures across the sample. COVID-19-related variables (COV, COV20, COV21, and COV22) indicate a predominant presence of the pandemic in the dataset, with the majority of observations falling within the pandemic years. Profitability, as measured by ROA (Return on Assets), displays variability, with an average of 0.01648. Firm Size (SIZE) exhibits diversity in company sizes, as reflected by a mean of 10.1217. Notably, Cash (CASH) showcases significant variability in cash holdings among companies, with a high standard deviation of 12.4105. Liquidity (LIQ) varied across firms, indicated by an average of 1.48403 and a standard deviation of 1.68228. Finally, Tangibility (TANG) reveals diversity in asset tangibility, with an average of 0.17226. These descriptive statistics provide essential insights into the dataset's characteristics, setting the stage for in-depth analysis and interpretation of the variables within the context of the study's objectives.

Table 3. Descriptive statistics for all variables (Obs = 7046).

Variables	Mean	p25	Media	p75	Std. Dev.	Skewness	Kurtosis
TDTA	0.90355	0.30939	0.48688	0.67395	1.50253	3.51519	14.6968
SDTA	0.40866	0.17159	0.28664	0.44831	0.76570	4.06021	19.7169
LDTA	0.34552	0.04166	0.13290	0.30040	0.69666	3.86725	18.4374
COV	0.59552	0.00000	1.00000	1.00000	0.49083	−0.38922	1.15149
COV20	0.20848	0.00000	1.00000	1.00000	0.40625	1.43522	3.05986
COV21	0.20777	0.00000	1.00000	1.00000	0.40574	1.44052	3.07511
COV22	0.17925	0.00000	1.00000	1.00000	0.17925	1.67247	3.79717
ROA	0.01648	3.29×10^{-7}	0.03363	0.07710	0.15103	−1.23616	5.86180
SIZE	10.1217	8.25660	9.96392	11.9292	2.18409	0.21487	1.88970
CASH	11.0573	2.22841	5.99378	15.3179	12.4105	1.57822	4.75951
LIQ	1.48403	0.49192	0.89851	1.68566	1.68228	2.05357	6.68344
TANG	0.17226	0.07022	0.13807	0.24705	0.13445	0.89513	2.97815

Source: Authors' calculation.

Table 4 provides a correlation matrix based on 7046 observations, showcasing the pairwise correlations among the variables. Upon inspection, it is evident that there is no indication of problematic multicollinearity in the dataset. None of the correlation coefficients between the variables exceed the threshold of 0.800, which is typically considered the point of concern for high multicollinearity. Whereas some correlations exist, such as the positive correlations among the COVID-19-related variables (COV, COV20, COV21, and COV22), these correlations do not surpass the critical threshold. Therefore, the absence of correlation coefficients exceeding 0.800 suggests that there is no severe multicollinearity issue, and the variables can be safely used in subsequent regression analyses without compromising their reliability.

Table 4. Correlation matrix (n = 7046).

Variables	COV	COV20	COV21	COV22	ROA	SIZE	CASH	LIQ	TANG
COV	1.0000								
COV20	0.4230	1.0000							
COV21	0.4221	−0.2628	1.0000						
C0V22	0.3851	−0.2398	−0.2393	1.0000					
ROA	−0.0573	−0.0220	−0.0201	−0.0288	1.0000				
SIZE	0.0423	−0.0058	0.0185	0.0407	0.0572	1.0000			
CASH	0.3149	0.1275	0.1596	0.0990	0.0091	−0.0260	1.0000		
LIQ	−0.0105	−0.0420	0.0218	0.0080	0.0392	0.0623	0.3173	1.0000	
TANG	0.0142	−0.0166	−0.0056	0.0416	−0.0337	−0.0794	−0.1011	−0.2811	1.0000

Source: Authors' calculation.

Table 5 shows the relationship between the COVID-19 pandemic and the company's capital structure while also exploring the influence of various control variables. Before the panel data regression analysis, the Chow and the Hausman tests were conducted to determine the best model between CEM, FEM, or REM. The results showed that the best model is FEM. The regression analysis was conducted in the following manner: Firstly, it examined the relationship between the COVID-19 pandemic and the capital structure. The analysis results revealed a significant and positive impact of COVID-19 on the capital structure (Columns 1–11). This positive effect was observed in the first year (COV20), the

second year (COV21), and the third year (COV22) of the pandemic, thus providing support for hypotheses 1–3. This is consistent with the findings of previous studies by Vo et al. (2022), Haque and Varghese (2023), and Gopalakrishnan et al. (2022). However, distinct findings emerged in the third year of the COVID-19 pandemic, where adverse effects were detected in the relationship between COVID-19 and the capital structure, particularly as measured by short-term debt to total assets. Consequently, the result does not align with Hypotheses 3.

Table 5. COVID-19 and capital structure.

Expl. Variables	Dependent Variable: TDTA				Dependent Variable: LDTA				Dependent Variable: SDTA			
	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
COV	0.6321 ***	0.6535 ***	0.4220 ***	−0.4171 ***	0.2284 ***	0.2663 ***	0.1661 ***	−0.2017 ***	0.3037 ***	0.3306 ***	0.1856 ***	−0.2002 ***
	(17.69)	(12.19)	(8.45)	(−15.04)	(14.41)	(11.40)	(7.90)	(−14.66)	(16.66)	(11.54)	(7.12)	(−14.70)
ROA	0.0211	−0.2517	−0.2550	−0.4371 **	0.1762	0.0803	0.0782	−0.0046	−0.0968	−0.2264 **	−0.2319 **	−0.3170 ***
	(0.10)	(−1.22)	(−1.23)	(−2.07)	(1.83)	(0.85)	(0.82)	(−0.05)	(−0.87)	(−2.04)	(−2.07)	(−2.79)
SIZE	−0.2376 ***	−0.0318	−0.1040 *	0.0320	−0.0415	0.0335	0.0049	0.0656 **	−0.1338 ***	−0.0345	−0.0673 ***	−0.0042
	(−3.66)	(−0.59)	(−1.78)	(0.56)	(−1.22)	(1.10)	(0.16)	(2.07)	(−4.57)	(−1.48)	(−2.63)	(−0.17)
CASH	−0.0014	0.0081 ***	0.0096 ***	0.0161 ***	0.0007	0.0039 ***	0.0046 ***	0.0073 ***	0.0018 **	0.0025 ***	0.0036 ***	0.0065 ***
	(−0.75)	(4.56)	(5.56)	(9.05)	(0.86)	(4.51)	(5.32)	(8.24)	(−2.05)	(3.15)	(4.45)	(7.99)
LIQ	−0.2914 ***	−0.2948 ***	−0.3257 ***	−0.3287 ***	−0.0852 ***	−0.0848 ***	−0.0975 ***	−0.0987 ***	−0.1641 ***	−0.1648 ***	−0.1807 ***	−0.1820 ***
	(−13.16)	(12.87)	(−13.89)	(−13.72)	(−7.98)	(−7.81)	(−8.88)	(−8.87)	(−15.58)	(−15.36)	(−15.83)	(−15.69)
TANG	−0.1029	0.5515	0.1896	0.6147	0.1876	0.4395	0.2924	0.4954 **	−0.3459 **	−0.0229	−0.2041	−0.0012
	(−0.26)	(1.38)	(0.46)	(1.47)	(0.82)	(1.91)	(1.24)	(2.07)	(−2.22)	(−0.15)	(−1.30)	(−0.01)
CONS.	3.3975 ***	1.3468	2.2170 ***	0.8648	0.7120 **	−0.0444	0.3027	−0.3027	1.9794 ***	0.9856 ***	1.3902 ***	0.7626 ***
	(5.24)	(2.53)	(3.84)	(1.54)	(2.16)	(−0.15)	(1.00)	(−1.00)	(6.68)	(4.21)	(5.40)	(3.07)
R-squared	0.1139	0.1117	0.0850	0.0823	0.0700	0.0769	0.0521	0.0565	0.1116	0.1138	0.0843	0.0845
F Statistic	76.52	58.15	47.90	59.42	49.83	37.63	26.17	41.00	72.88	62.15	54.76	63.94
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046

Note: ***, **, and * are significant at the 1%, 5%, and 10% confidence levels, respectively. Source: Authors' calculation.

In terms of the control variables, this study reveals that these variables exerted an impact on the capital structure that aligned with our expectations. Firstly, considering the variable ROA (Return on Assets), the analysis consistently identified a significant negative influence on the capital structure across different columns (Columns 4, 11, and 12). This observed negative effect signifies that an increase in profitability leads to a reduced reliance on debt, particularly short-term debt, a trend notably pronounced in the third year of the pandemic. Secondly, the variable SIZE exhibited a noteworthy and consistently negative impact on the capital structure in various columns (Columns 1, 3, 8, 9, and 11). These findings suggest that larger companies tend to have a lower dependence on debt as a source of financing. This result is consistent with those found by Alrwashdeh et al. (2023), Faturohman and Noviandy (2022), Prakash et al. (2023), and Vo et al. (2022).

Moving on, the variable CASH (Cash Holdings) yielded an interesting result. The analysis consistently demonstrated a significant positive impact on the capital structure (Columns 1–12). This indicates that an increase in cash reserves, often used for operational contingencies during crises, leads to a heightened reliance on both short-term and long-term debt as part of a financial strategy. Conversely, for the LIQ (Liquidity) variable, the findings consistently point to a significant negative impact on the capital structure across different columns (Columns 1–12). This suggests that a decreasing ability to meet short-term obligations corresponds to an increasing dependence on debt for financing among companies.

Lastly, when examining the TANG (Tangibility) variable, a somewhat mixed outcome emerged. On one hand, there was a significant positive impact of tangibility on the capital structure, particularly noticeable in long-term debt, during the third period of the pandemic (Column 8). On the other hand, a significant negative impact of tangibility

on the capital structure was observed, particularly in short-term debt, across all periods of the COVID-19 pandemic (Column 9). These findings underscore the complexity of the relationship between tangibility and the capital structure, emphasizing the need for nuanced consideration in financial decision-making.

Table 6 provides insights into the influence of the COVID-19 pandemic on capital structure across various industries. The analysis indicates a notable positive and significant impact of COVID-19 on capital structure in several columns (Columns 1, 5, and 9). This positive effect of the pandemic on capital structure is particularly evident during the initial and second years for all industries within the consumer goods sector. However, a noteworthy shift occurred in the third year of the COVID-19 pandemic, revealing a negative impact on capital structure (Columns 4, 8, and 12). This shift suggests a transition in the capital structure of companies as they entered the third year of the pandemic, marked by a decrease in debt utilization. This contrasts with the first and second years when companies relied more on debt relative to their capital.

Table 6. COVID-19 and capital structure by industries.

Expl. Variables	Dependent Variable: TDTA				Dependent Variable: LDTA				Dependent Variable: SDTA			
	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Alcoholic Beverages/Drinks												
COV	0.5966 ***	0.5720 ***	0.3832 ***	−0.3792 ***	0.2568 ***	0.2536 ***	0.1662 ***	−0.1742 ***	0.2678 ***	0.2948 ***	0.1577 **	−0.2004 ***
	(7.55)	(4.24)	(2.97)	(−5.57)	(6.14)	(4.21)	(2.98)	(−4.88)	(6.67)	(3.84)	(2.28)	(−5.54)
CONS.	4.4960 ***	2.6700 ***	3.2320 ***	2.0647 **	1.6130 ***	0.8262	1.0705 **	0.5475	2.0213 ***	1.1986 **	1.4345 ***	0.8781 *
	(3.79)	(2.77)	(3.10)	(2.15)	(2.72)	(1.62)	(2.05)	(1.06)	(3.41)	(2.49)	(2.80)	(1.81)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1220	0.1145	0.0917	0.0878	0.0828	0.0783	0.0554	0.0535	0.1054	0.1092	0.0824	0.0856
F Statistic	12.08	8.27	6.22	7.32	7.41	4.46	3.39	5.72	11.16	9.35	8.12	9.19
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	935	935	935	935	935	935	935	935	935	935	935	935
Panel B: Food Products												
COV	0.6054 ***	0.6117 ***	0.4520 ***	−0.4253 ***	0.2043 ***	0.2372 ***	0.1680 ***	−0.1970 ***	0.3092 ***	0.3261 ***	0.2039 ***	−0.0765 ***
	(14.71)	(9.66)	(7.55)	(−12.93)	(11.95)	(9.11)	(6.84)	(12.31)	(14.23)	(9.55)	(6.55)	(−12.52)
CONS.	2.3050 ***	0.4951	1.2166 *	−0.0839	0.0028	−0.6183 **	−0.3468	−0.9021 ***	1.6407 ***	0.7116 **	1.0539 ***	0.4476
	(3.19)	(0.80)	(1.90)	(−0.13)	(0.01)	(−2.02)	(−1.14)	(−2.82)	(4.69)	(2.46)	(3.44)	(1.46)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1039	0.0994	0.0812	0.0765	0.0674	0.0727	0.0554	0.0589	0.1046	0.1037	0.0785	0.0765
F Statistic	52.94	38.80	34.17	41.79	35.21	26.12	19.94	28.90	53.56	44.74	41.30	46.12
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	5154	5154	5154	5154	5154	5154	5154	5154	5154	5154	5154	5154
Panel C: Non-Alcoholic Beverages/Drinks												
COV	0.7661 ***	0.6691 ***	0.5042 ***	−0.4050 ***	0.2686 ***	0.2771 ***	0.2305 ***	−0.2504 ***	0.3007 ***	0.2573 ***	0.2268 ***	−0.1852 ***
	(5.69)	(4.16)	(3.29)	(−3.98)	(4.10)	(3.40)	(3.20)	(−4.41)	(5.12)	(3.31)	(2.70)	(−4.16)
CONS.	1.9825	−1.3866	−0.0825	−2.0662	−0.8109	−2.0210 *	−1.4441	−2.5331 *	2.1946 ***	0.8755	1.4328 ***	0.5319
	(1.23)	(−0.76)	(−0.05)	(−1.06)	(−0.69)	(−1.71)	(−1.29)	(−1.98)	(3.61)	(1.56)	(2.76)	(0.85)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1740	0.1578	0.1392	0.1292	0.1138	0.1140	0.1035	0.1047	0.1538	0.1421	0.1359	0.1277
F Statistic	9.17	7.21	7.29	7.03	5.69	5.17	4.85	5.62	7.81	6.46	7.06	6.94
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	672	672	672	672	672	672	672	672	672	672	672	672
Panel D: Tobacco												
COV	0.6128 ***	1.0644 ***	−0.1106	−0.1728	0.2523 ***	0.3588 ***	0.0350	−0.0813	0.2558 **	0.5726 ***	−0.1195	−0.1186 **
	(3.55)	(3.69)	(−0.62)	(−1.65)	(3.30)	(3.12)	(0.36)	(−1.27)	(2.61)	(3.47)	(−1.50)	(−2.50)
CONS.	14.169 ***	10.547 ***	13.661 ***	13.661	7.2422 ***	6.0015 ***	7.2095 ***	7.0189 ***	5.6810	3.7647 ***	5.3087 ***	5.4040 ***
	(5.09)	(4.26)	(4.66)	(4.74)	(4.84)	(4.25)	(4.70)	(4.58)	(4.08)	(3.28)	(3.70)	(3.86)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.4588	0.5085	0.4245	0.4257	0.5917	0.6046	0.5711	0.5725	0.2877	0.3650	0.2669	0.2663
F Statistic	110.23	111.12	72.13	68.69	43.15	45.13	37.36	36.62	23.50	18.59	23.72	27.22
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	285	285	285	285	285	285	285	285	285	285	285	285

Note: ***, **, and * are significant at the 1%, 5%, and 10% confidence levels, respectively. Source: Authors' calculation.

Turning our attention to Tables 7 and 8, they explore the impact of the COVID-19 pandemic on capital structure based on market types and regions, respectively. Mirroring the findings in Table 6, the results in Table 7 indicate a consistent positive and significant impact of COVID-19 on the capital structure across companies in developed markets, emerging markets, frontier markets, and standalone markets. However, a notable shift emerges in the third year of the COVID-19 pandemic, as the analysis reveals a negative influence on capital structure. This pattern is also mirrored in Table 8, where the impact of COVID-19 on capital structure is initially positive and significant in the first and second years but transitions to a negative and significant impact in the third year, encompassing different global regions such as the Americas, Europe, Middle East, Africa, and Asia and the Pacific, albeit with varying degrees of significance. In summary, these findings collectively highlight that the influence of the COVID-19 pandemic on capital structure exhibited a consistent positive and significant trend in the initial years, only to evolve into a negative and significant impact in the third year, irrespective of industry, market type, or region.

Table 7. COVID-19 and capital structure by markets.

Expl. Variables	Dependent Variable: TDTA				Dependent Variable: TDTA				Dependent Variable: TDTA			
	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Developed Markets												
COV	0.7225 ***	0.7741 ***	0.4825 ***	−0.4761 ***	0.2902 ***	0.3596 ***	0.2072 ***	−0.2598 ***	0.3048 ***	0.3577 ***	0.1801 ***	−0.2103 ***
	(12.11)	(9.07)	(6.12)	(−10.78)	(9.94)	(8.59)	(5.63)	(−11.12)	(11.09)	(8.39)	(4.86)	(10.05)
CONS.	3.7529 ***	1.6611 **	2.5783 ***	1.2070	0.5535	−0.3079	0.0977	−0.5831	2.2541 ***	1.3580	1.7304 ***	1.1643 ***
	(4.76)	(2.13)	(3.35)	(1.47)	(1.14)	(−0.67)	(0.21)	(−1.20)	(6.69)	(4.14)	(5.42)	(3.42)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1389	0.1399	0.1053	0.1032	0.0841	0.0981	0.0624	0.0702	0.1408	0.1503	0.1111	0.1144
F Statistic	39.41	30.76	27.03	30.46	25.72	20.80	15.59	23.20	35.48	31.74	27.30	31.07
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	2897	2897	2897	2897	2897	2897	2897	2897	2897	2897	2897	2897
Panel B: Emerging Markets												
COV	0.5413 ***	0.5794 ***	0.3285 ***	−0.3494 ***	0.1663 ***	0.1866 ***	0.1164 ***	−0.1361 ***	0.3023 ***	0.3259 ***	0.1795 ***	−0.1933 ***
	(11.31)	(7.54)	(4.71)	(−9.22)	(8.89)	(6.56)	(4.32)	(8.28)	(11.36)	(7.47)	(4.57)	(−9.76)
CONS.	2.9734 ***	1.1920	1.8805 **	0.7677	0.7587	0.2067	0.4405	0.0199	1.5993	0.6030 *	0.9844	0.3712
	(2.75)	(1.49)	(2.04)	(0.90)	(1.56)	(0.51)	(1.01)	(0.05)	(3.21)	(1.70)	(2.36)	(0.96)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0894	0.0899	0.0626	0.0620	0.0551	0.0580	0.0404	0.0420	0.0918	0.0928	0.0648	0.0645
F Statistic	29.18	22.05	16.72	22.87	18.32	13.50	8.23	14.28	31.91	26.91	23.19	27.40
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	3360	3360	3360	3360	3360	3360	3360	3360	3360	3360	3360	3360
Panel C: Frontier and Standalone Markets												
COV	0.6705 ***	0.5478 ***	0.5689 ***	−0.4911 ***	0.2604 ***	0.2605 ***	0.2094 ***	−0.2395 ***	0.3049 ***	0.2661 ***	0.2280 ***	−0.2080 ***
	(6.51)	(3.54)	(3.53)	(−5.12)	(6.22)	(3.85)	(3.59)	(−5.08)	(5.37)	(3.21)	(2.60)	(−4.83)
CONS.	3.6479 **	0.4689	1.8975	−0.6359	1.4798 **	0.2141	0.7784	−0.3291	2.0743 ***	0.6178	1.2207	0.1721
	(2.56)	(0.33)	(1.44)	(−0.38)	(2.31)	(0.35)	(1.34)	(−0.47)	(3.22)	(1.02)	(2.11)	(0.24)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1295	0.1114	0.1117	0.0993	0.0979	0.0957	0.0796	0.0811	0.1110	0.1006	0.0921	0.0861
F Statistic	11.92	8.32	6.36	7.13	9.14	5.65	3.87	5.14	8.71	7.67	7.92	8.18
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	789	789	789	789	789	789	789	789	789	789	789	789

Note: ***, **, and * are significant at the 1%, 5%, and 10% confidence levels, respectively. Source: Authors' calculation.

Although the relationship between COVID-19 and capital structure is robust with different measures, the use of regression with robust standard errors can be justified. This method generates regression coefficient estimates similar to standard OLS linear regression while producing more robust estimates of standard errors, making it less sensitive to potential violations of assumptions related to the normality and homogeneity of residual variance. Therefore, in the context of this research, where the possibility of non-normality or heteroscedasticity may occur in the examined data, employing the regression with robust standard errors method can provide more reliable and dependable estimates for accurately

analyzing the impact of COVID-19 on corporate capital structure. According to the results, the overall impact of COVID-19 on the capital structure remained unchanged.

Table 8. COVID-19 and capital structure by regions.

Expl. Variables	Dependent Variable: TDTA				Dependent Variable: TDTA				Dependent Variable: TDTA			
	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Americas												
COV	0.8466 ***	0.6185 ***	0.9022 ***	−0.6023 ***	0.3360 ***	0.3081 ***	0.3771 ***	−0.3301 ***	0.3422 ***	0.2834 ***	0.3397 ***	−0.2544 ***
	(7.87)	(4.23)	(5.78)	(−7.49)	(6.34)	(4.11)	(5.05)	(−7.54)	(7.19)	(3.97)	(4.83)	(−6.77)
CONS.	2.2033 **	0.0658	1.3572	−0.5823	−0.4555	−1.3191 **	−0.7672	−1.6818 **	2.0209	1.1487	1.6471 ***	0.8802 *
	(2.08)	(0.06)	(1.35)	(−0.50)	(−0.72)	(−2.14)	(−1.30)	(−2.56)	(4.51)	(2.53)	(4.00)	(1.84)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1816	0.1530	0.1800	0.1488	0.1167	0.1078	0.1195	0.1083	0.1820	0.1660	0.1754	0.1586
F Statistic	21.20	16.16	18.49	17.82	14.72	11.86	11.08	13.16	17.43	14.40	16.56	16.20
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	1088	1088	1088	1088	1088	1088	1088	1088	1088	1088	1088	1088
Panel B: Europe												
COV	0.8579 ***	1.0832 ***	0.3758 ***	−0.5481 ***	0.3564 ***	0.4682 ***	0.1929 ***	−0.2982 ***	0.3888 ***	0.5247 ***	0.1134 *	−0.2196 ***
	(8.94)	(6.89)	(2.95)	(−6.40)	(7.62)	(6.60)	(3.36)	(−6.85)	(8.04)	(6.40)	(1.82)	(−5.47)
CONS.	5.5833 ***	1.2717	3.2812 **	1.0121	2.8630 ***	1.0493	1.9723 **	0.7584	2.4071 ***	0.4113	1.2623 **	0.4193
	(3.70)	(0.91)	(2.26)	(0.62)	(3.40)	(1.36)	(2.47)	(0.87)	(3.89)	(0.77)	(2.19)	(0.65)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1680	0.1916	0.1073	0.1148	0.1518	0.1767	0.1084	0.1204	0.1321	0.1643	0.0740	0.0825
F Statistic	18.50	14.95	10.30	12.08	13.32	11.57	8.25	11.49	14.60	12.02	8.60	10.00
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	1048	1048	1048	1048	1048	1048	1048	1048	1048	1048	1048	1048
Panel C: Middle East												
COV	0.5898 ***	0.8728 *	0.0722	−0.4530 *	0.2199 ***	0.3764 *	−0.0318	−0.1569 ***	0.2798 **	0.4138 *	0.0609	−0.2513 **
	(2.81)	(1.98)	(0.24)	(−1.98)	(2.89)	(2.01)	(−0.25)	(1.25)	(2.47)	(1.85)	(0.38)	(−2.42)
CONS.	6.7430	4.6458	3.7823	2.3927	0.5376	−0.1888	−0.6370	−1.0501	3.9334 *	2.9382	2.5609	1.7650
	(1.37)	(1.12)	(0.74)	(0.45)	(0.43)	(−0.19)	(−0.53)	(−0.69)	(1.76)	(1.54)	(1.10)	(0.75)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.1201	0.1662	0.0790	0.0959	0.0685	0.1302	0.0353	0.0469	0.1388	0.1768	0.1060	0.1241
F Statistic	2.13	1.45	1.85	1.15	3.36	2.55	3.65	2.13	1.99	1.74	0.81	1.31
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	134	134	134	134	134	134	134	134	134	134	134	134
Panel D: Africa												
COV	0.6132 ***	0.6933 ***	0.2454	−0.4046 ***	0.2529 ***	0.3324 ***	0.0554 ***	−0.1713 ***	0.2405 ***	0.2766 **	0.1302	−0.2059 ***
	(4.51)	(2.83)	(1.05)	(−3.46)	(3.87)	(3.02)	(0.71)	(−4.19)	(3.60)	(2.24)	(1.01)	(−3.21)
CONS.	2.0649	−0.6864	0.1217	−1.3357	1.8452	0.6908	0.9470	0.4321	0.5835	−0.4977	−0.1069	−0.8601
	(1.15)	(−0.37)	(0.07)	(−0.62)	(1.63)	(0.77)	(0.93)	(0.43)	(0.77)	(−0.55)	(−0.13)	(0.73)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0867	0.0983	0.0520	0.0597	0.0678	0.0999	0.0261	0.0398	0.1083	0.1152	0.0930	0.0992
F Statistic	5.71	4.46	3.01	3.53	3.84	3.47	1.85	3.63	4.28	4.03	3.39	3.79
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	395	395	395	395	395	395	395	395	395	395	395	395
Panel E: Asia and the Pacific												
COV	0.5301 ***	0.5529 ***	0.3317 ***	−0.3273 ***	0.1710 ***	0.1953 ***	0.1190 ***	−0.1386 ***	0.2817 ***	0.3003 ***	0.1733 ***	−0.1780 ***
	(12.64)	(8.76)	(5.65)	(−10.23)	(10.31)	(7.99)	(5.17)	(−9.67)	(12.25)	(8.48)	(5.29)	(−11.02)
CONS.	3.4943 ***	1.8992 ***	2.5208	1.5383 **	0.7649 *	0.2416	0.4631	0.0692	1.8209	0.9700 ***	1.3005	0.7735 **
	(3.68)	(2.64)	(3.06)	(2.05)	(1.92)	(0.71)	(1.29)	(0.20)	(4.12)	(2.98)	(3.42)	(2.23)
Cont. Var.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.0891	0.0878	0.0624	0.0604	0.0512	0.0556	0.0354	0.0377	0.0935	0.0940	0.0684	0.0676
F Statistic	35.32	25.81	21.01	27.74	22.71	15.71	11.13	18.15	38.22	33.12	28.96	34.83
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	4381	4381	4381	4381	4381	4381	4381	4381	4381	4381	4381	4381

Note: ***, **, and * are significant at the 1%, 5%, and 10% confidence levels, respectively. Source: Authors' calculation.

5. Discussion

This research endeavors to investigate the profound implications of the COVID-19 pandemic on the capital structure of companies within the global consumer goods sector. The assessment encompasses a detailed examination of critical ratios, including total debt to total assets, short-term debt to total assets, and long-term debt to total assets. Moreover, this

study scrutinizes the pandemic's impact on capital structures across various dimensions, including industries (such as Alcoholic Beverages/Drinks, Food Products, Non-Alcoholic Beverages/Drinks, and Tobacco), market types (comprising Developed Markets, Emerging Markets, Frontier, and Standalone Markets), and diverse global regions (spanning the Americas, Europe, Middle East, Africa, and Asia and the Pacific).

The significant negative impact of COVID-19 on the capital structure, as evident in Table 5, signifies a substantial shift in how companies have approached their financing decisions and managed their capital structures during the observed period. This result is consistent with the results found by Alp et al. (1862), Alrwashdeh et al. (2023), Faturohman and Noviandy (2022), Kim (2023), Nguyen et al. (2023), Prakash et al. (2023), and Vo et al. (2022). This suggests that during the pandemic, companies may have adopted a more cautious approach toward debt utilization or implemented conservative debt-related policies. This shift could also reflect companies' efforts to mitigate the financial risks associated with debt usage amid the uncertainty of the pandemic. However, as indicated by the positive outcomes in Table 5, especially concerning the increase in short-term debt, as we entered the third year of the COVID-19 pandemic, the shift suggests that companies have adapted to the changing circumstances. With declining COVID-19 cases and a transition toward a "new normal," companies may perceive opportunities to use short-term debt as a means to support growth or investments in an economic recovery scenario. These positive results likely mirror companies' responsiveness to shifting economic conditions and their strategic use of available opportunities amidst ongoing changes.

Table 6 provides valuable insights into the effects of the COVID-19 pandemic on capital structure across various industries. The results consistently demonstrate a significant positive impact of COVID-19 on capital structure in different sectors, suggesting that companies diversified across industries increasingly turned to debt as a financing source during the initial and second years of the pandemic. However, a significant shift became apparent in the third year of the pandemic, where the impact on capital structure turned negative. This indicates that, as companies entered the third year of the pandemic, they began altering their financing strategies to reduce reliance on debt, showcasing their adaptability to evolving economic circumstances.

Shifting our focus to Table 7, we examine the influence of the COVID-19 pandemic on capital structure with a market-oriented lens. Regardless of whether companies operated in developed markets, emerging markets, frontier markets, or standalone markets, the findings consistently revealed a significant positive impact of COVID-19 on capital structure during the initial and second years of the pandemic. This implies that companies, irrespective of their market types, sought increased debt utilization as a response to pandemic-related challenges. However, the narrative evolves intriguingly in the third year of the pandemic, as a negative impact on capital structure emerges. This suggests that, as the pandemic matured, companies in these markets adjusted their financial strategies to decrease dependence on debt, showcasing their adaptability to changing economic conditions.

Finally, Table 8 shifts our attention to the global regional perspective of the impact of the COVID-19 pandemic on capital structure. Parallel to the previous tables, the results consistently portray a significant positive effect of COVID-19 on capital structure during the initial and second years, encompassing regions such as the Americas, Europe, Middle East, Africa, and Asia and the Pacific. This indicated that companies across diverse geographical areas increased their reliance on debt as a response to pandemic-induced challenges. However, the narrative takes an intriguing turn in the third year of the pandemic, as a negative impact on capital structure unfolds across all regions. This implies that, as the pandemic continued to evolve, companies in these global regions adapted their financial strategies to reduce their dependence on debt, highlighting their adaptability and versatility in navigating the changing economic landscape during the pandemic.

Overall, the findings across Tables 5–8 provide an intricate mosaic of the COVID-19 pandemic's multifaceted influence on corporate capital structures. These insights underscore the resilience and adaptability of companies across diverse dimensions—industries,

market types, and global regions—in the face of unprecedented challenges. As the pandemic swept through, the initial and second-year positive impacts on capital structure portrayed companies' strategic reliance on debt for sustained operations. However, as we delved into the third year of the pandemic, a shift toward reduced debt dependency emerges, showcasing their capacity to recalibrate financial strategies in response to evolving economic conditions. The dynamic nature of companies' actions as they maneuver through the uncertainties of the pandemic exemplifies their ability to navigate complexities and seize opportunities amidst change. As the world continues to grapple with the pandemic's aftermath, these insights stand as valuable considerations for businesses charting their financial courses in a dynamic and uncertain landscape. Additionally, these results are also robust by re-analyzing using Regression with robust standard errors (Table 9).

Table 9. Robustness tests: regression with robust standard errors.

Expl. Variables	Dependent Variable: TDTA				Dependent Variable: LDTA				Dependent Variable: SDTA			
	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22	COV	COV20	COV21	COV22
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
COV	0.5697 ***	0.6689 ***	0.4178 ***	−0.3995 ***	0.2249 ***	0.2702 ***	0.1723 ***	−0.1799 ***	0.2560 ***	0.3359 ***	0.1781 ***	−0.2047 ***
	(17.34)	(12.45)	(8.37)	(−16.82)	(15.14)	(11.51)	(8.04)	(−14.52)	(15.74)	(11.69)	(6.90)	(−17.57)
CONS.	1.2871 ***	1.2776	1.3892 ***	1.4009 ***	0.3920 ***	0.3599 ***	0.4177 ***	0.4005 ***	0.7002 ***	0.6994 ***	0.7524 ***	0.7643 ***
	(12.80)	(12.62)	(13.49)	(13.54)	(7.50)	(6.90)	(7.85)	(7.49)	(13.72)	(13.71)	(14.45)	(14.67)
R-squared	0.1039	0.1064	0.0786	0.0768	0.0623	0.0694	0.0449	0.0473	0.1040	0.1122	0.0814	0.0833
Wald Chi	549.36	508.30	462.66	489.59	329.53	247.45	196.15	261.19	756.65	744.47	717.70	706.93
Prob > Chi	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Obs.	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046	7046

Note: *** is significant at the 1% confidence levels. Source: Authors' calculation.

6. Conclusions

The research aimed to comprehensively investigate the intricate impacts of the COVID-19 pandemic on the capital structures of global consumer goods companies. This involved analyzing a dataset of 1491 companies across 80 countries from 2018 to 2022, and exploring various dimensions such as industries, market types, and global regions. The findings revealed a significant and initially positive influence of the pandemic on capital structures, signaling a substantial shift in companies' financing strategies. This shift could suggest a more cautious approach to debt utilization and the adoption of risk-mitigating measures in response to the pandemic's uncertainties. However, the negative outcomes observed, especially the rise in short-term debt, as the third year of the pandemic approached, indicated companies' adaptability. With decreasing COVID-19 cases and the shift toward a "new normal," businesses recognized opportunities in short-term debt for growth and investment during the economic recovery phase. The insights gleaned from these analyses underscored companies' resilience and their ability to adjust financial strategies in response to evolving economic conditions across diverse dimensions—industries, market types, and global regions.

The research findings carry significant policy implications for managers navigating their companies through pandemic-induced challenges and the evolving economic landscape. Firstly, the observed shift toward a more conservative approach to debt during the early pandemic years suggests that managers should carefully evaluate their financing decisions. This includes considering a balance between debt and equity to mitigate financial risks and ensure long-term sustainability. Secondly, as the study reveals an increasing reliance on short-term debt as the pandemic progresses and economies transition toward a "new normal," managers should recognize this as an opportunity. They can strategically leverage short-term debt to fund growth initiatives, seize emerging market opportunities, or invest in innovations that align with evolving consumer demands. Thirdly, managers should remain agile in their financial strategies, recognizing that adaptability is a key asset in times of uncertainty. As the pandemic's dynamics continue to unfold, businesses should be prepared to recalibrate their capital structures to respond effectively to changing

circumstances. This adaptability should extend to industry-specific and regional considerations, as the research highlights the varying impacts of the pandemic across sectors and global regions. Ultimately, a prudent and adaptable financial strategy, coupled with a keen understanding of market dynamics, will position managers to navigate successfully through these challenging times and capitalize on opportunities for growth and resilience.

Despite the valuable insights provided by this study, it is essential to acknowledge certain limitations and offer recommendations for future research. Firstly, this research primarily focuses on the immediate and short-term impacts of the COVID-19 pandemic on capital structure. A more comprehensive understanding could be achieved by extending the study period to assess the long-term implications of the pandemic. Additionally, while this study examines capital structure from various dimensions, there is room for deeper exploration of the underlying mechanisms driving these changes. Qualitative research methods or case studies could provide valuable insights into the decision-making processes of companies during times of crisis. Furthermore, future research could delve into the role of government policies and interventions in shaping companies' capital structure choices during a pandemic. Lastly, given the diverse industries, market types, and regions, future studies could conduct more granular analyses within these categories to uncover sector-specific, market-specific, or region-specific nuances in capital structure dynamics. Overall, these recommendations aim to enrich our understanding of how external shocks, such as pandemics, impact corporate finance decisions and contribute to the resilience and adaptability of businesses in an ever-changing world.

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