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How Off-Balance Sheets Exposures Reshapethedebt Ratio for Sustainable Future

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Abstract

This study investigates the impact of off-balance sheet commitments on the debt ratio of companies listed on the Tunisian Stock Exchange (BVMT) within the context of an uncertain economic climate and evolving credit practices. Recognizingthat these unrecorded obligations can significantly influence a firm's future financial standing and risk profile, the research aims to determine the effect of off-balance sheet engagements (ENGAG) on the total debt to total assets ratio (TDA). Employingpanel data analysis on 38 companies from 2019 to 2024 and utilizing GeneralizedLinear Models (GLM) and Ordinary Least Squares (OLS) regression, our questions are: What is the impact of off-balance sheet commitments on the debt ratio? Andhowcan we know the impact of other factors on the debt ratio? The findings reveal a significant positive relationship between off-balance sheet engagements and the debt ratio. This suggests that increased reliance on thesefinancing tools is associated with higher leverage, underscoring the importanceof considering financial transparency and potential hidden risks when evaluatingacompany's financial health.

Keywords: Off-Balance Sheet Commitments, Debt Ratio, Tunisian Stock Exchange, Panel Data Analysis

Introduction

Nowadays, the market has become more uncertain, and off-balance sheet commitments have gained importance in understanding their impact, particularly on investors and financing decisions. Consequently, the emergence of new forms of credit and financial innovation is a relevant area for determining their influence on financing. Several studies have examined this impact. For instance, Saifi and Khouiled (2024) and Garcia et al. (2017) explored the integration of off-balance sheet items into the debt ratio [1,2]. Some research, like Defant (1994), found a

positive impact, while others, such as, reported a negative impact [3].

Specifically, according to Garcia et al. (2017), substantial off-balance-sheet items significantly influenced the debt ratio [2]. They attributed this to investors using alternative financing methods. Furthermore, Chen et al.'s (2010) research identified varied connections between financing and off-balance- sheet activities, depending on the specific nature of these arrangements, such as guarantees and lease contracts [4]. For instance, guarantees can reassure creditors and lower debt costs, whereas lease contracts may increase risk and consequently raise a company's cost of debt.

In addition, Defant (1994) detected a positive correlation between debt and commitments [3]. Conversely, Beattie and Weber (2003) reported a negative impact of financing on off-balance-sheet items, suggesting they act as a substitute for traditional debt [5]. Amir and Lev (1996) also highlighted that information within off-balance-sheet items can affect the accuracy of financial forecasts, underscoring its importance [6]. Similarly, Baber and Kang (2008) indicated that budgetary risk in off-balance-sheet items can influence the precision of financial forecasts [7].

Moreover, companies utilizing a diverse range of financing instruments, including off-balance sheet items like loan commitments, letters of credit, and guarantees (representing future resources), can present a favorable view of their future sustainability and impact the debt ratio.

Considering these conflicting opinions, this article aims to understand this impact. It is crucial to identify and prevent crises by controlling credit commitments that contribute to high levels of debt. Furthermore, the impact of credit commitment on the debt ratio has become an essential and current issue for banks, borrowers, regulators, and financial researchers. It contributes to a better understanding of financial risks and the promotion of healthier and more stable economic management. Evaluating the potential impact of commitments on clients' debt ratios is also essential for prudent credit risk management, influencing lending decisions. Based on these researches, our questions are: What is the impact of off-balance sheet commitments on the debt ratio? And how can we know the impact of other factors on the debt ratio?

Theory

Off-balance sheet commitments arise from contracts signed with external entities, creating obligations for the company or towards third parties without a corresponding reflection on the balance sheet at a similar amount. Contract law broadly covers these types of off-balance sheet items. Clearly, two companies with identical balance sheets can have different values if one has signed a contract committing it or third

parties in the future. Current regulations require companies to disclose commitments received or given that do not appear on the balance sheet in the notes to the financial statements, although a specific definition of these commitments is not provided. For banks, common off-balance sheet items include loan assignments, financing commitments (credit lines, overdraft facilities), loan guarantees, and contractual derivative transactions (swaps, futures, etc.).

Related to these financial concepts, the research by Puspita and Sadeli (2024) aimed to detect the influence of company size, profitability, financial structure, and risk profile as independent variables on firm value (the dependent variable), with dividend policy as a moderating factor [8]. Focusing on banking companies listed on the Indonesia Stock Exchange from 2013-2022 and using a purposive sampling of 110 observations, the results indicated that profitability and financial structure positively affect firm value. However, company size and risk profile showed no effect, and dividend policy moderated the relationship between financial structure and risk profile with firm value, but not with company size and profitability.

Further expanding on balance sheet commitments, Faouzi Saifi and Brahim Khouiled (2024) focused on the impact of off-balance sheet items on the technical efficiency of banks, using a case study of 12 private Algerian banks between 2011 and 2020 [1]. Their research aimed to determine the impact of these items on business leadership, specifically bank technical efficiency. They defined off-balance sheet items as the independent variable, quantified as the ratio of total off-balance sheet financing to total assets.

Based on provided documents and general financial definitions, off-balance sheet commitments (Engagements hors bilan) are rights and obligations not directly on the balance sheet but with potential future financial impact, typically disclosed in financial statement notes. Common examples include guarantees, operating leases, loan commitments/credit lines, and derivatives. These are crucial for assessing a company's true financial exposure and potential future liabilities.

In the broader context of corporate finance, dividend policy theories also offer insights into financial decision-making. The Bird in the Hand Theory posits that investors prefer immediate dividends over uncertain future capital gains from retained earnings, making current dividends more attractive due to lower perceived risk [9]. However, Miller and Modigliani (1961) challenged this with the Dividend Irrelevance Theory, arguing that in perfect markets, dividend policy does not affect a company's stock price [10]. In contrast, other researchers, like Baker (2009), indicated that dividend policy is influenced by investor sentiment, with managers paying dividends when investors favor dividend-paying stocks [11]. Furthermore, Brigham and

Houston (2007) suggested the Clientele Effect Theory, where different investor groups prefer different dividend policies, leading to varying dividend rates [12]. They also proposed the Residual Theory, where dividends are paid from remaining profits after funding profitable investments. Myers (1984) also established the Pecking Order Theory, where companies prioritize funding sources based on risk [13].

Data and Measurements

Model

Estimation Equation:

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I_TDA = C (1) + C (2) *CASH + C (3) *DIV + C (4) *MARGIN + C (5) *SIZE + C (6) *ENGAG + C (7) *TANG + C (8) *LEV + C (9) *TURNOVER+RESID

Forecasting Equation:

==========

I_TDA = C (1) + C (2) *CASH + C (3) *DIV + C (4) *MARGIN + C (5) *SIZE + C (6) *ENGAG + C (7) *TANG + C (8) *LEV + C (9) *TURNOVER+RESID

Substituted Coefficients:

==========

I_TDA = 0.443568427898 - 0.363887403662*CASH - 0.0995234138478*DIV + 0.00395988817341*MARGIN + 0.0100038583763*SIZE + 0.00448073932244*ENGAG - 0.207013647621*TANG + 0.189140703346*LEV + 3.30132051976e-05*TURNOVER+RESID

We used the model of Affandi, Sunarko, Yunananto, 2025 with:

Tang=inventory/total asset
size = log of asset
Tda=total debt/total asset
cash ratio=Cash/current liabilities
ratio div=div/Earning per share
lev= log of leverage, leverage=total debt/capital
engag=ratio engagement/exchange volume
margin and turnover : data from database stream

Independent Variables

Liquidity: The Cash Ratio (Cash / Short-Term Liabilities) represents a company's liquidity, indicating its ability to meet short-term obligations. This ratio is of particular interest to short-term creditors [14,15].

Leverage: Shows the proportion of debt financing relative to total capital. Analysts consider this a key ratio for performance evaluation due to the risk- return relationship [15].

Turnover (by volume): Receivables Turnover indicates how efficiently a company collects its sales on credit. A higher turnover suggests faster collections [16].

Margin: is impacted by various factors such as the cost of goods sold, expenses, interest, and taxes. A higher net profit margin means more profit is available to increase assets, potentially decreasing the need for external financing [17,18].

Dividend Payout Ratio: The Dividend Payout Ratio suggests a more informative signal as it focuses on internal factors (dividends and earnings) [19].

Sample and Methodology

Our analysis focuses on a panel database of 39 companies listed on the Tunisian Stock Exchange (BVMT) from 2019 to 2024. This period was chosen due to the limited number of listed firms. All variables were collected annually from the companies' annual reports, available on their websites and the Data Stream database. This research employed a quantitative method using panel data regression analysis with the Eviews application. The panel datasets comprise annual data over five years (2019-2024) for 38 companies, a total of 228 observations from the Tunisian market.

Normality Test

Furthermore, if the random cross-sectional disturbances satisfy the classical assumptions of ordinary regression methods, i.e., they are centered, homoscedastic, independent, and normally distributed, then the estimations are optimal and favor the use of Fisher tests to assess the existence of the terms ui or vt

	TDA	CASH	LEVERAGE	MARGIN	SIZE	TANG	TURNOVER	ENGAG
Mean	0.28	0.318	-0.748	8.625	13.664	0.11	3337.7	3.345
Median	0.165	0.095	-0.330	10.13	13.4	0.00	1624.7	0.000
Maximum	3.206	8.960	1.018	31.780	17.034	0.755	54217.60	208.070

Minimum	0.000	0.000	-4.692	-324.10	9.441	0.000	1.900	0.000
Std. Dev.	0.422	1.006	1.160	31.171	2.121	0.172	5743.204	16.564
Skewness	3.719	7.168	-1.059	-10.074	-0.050	1.724	4.155	9.238
Kurtosis	21.554	65.971	3.570	108.179	1.984	5.735	24.369	106.517
Jarque-Bera	2314.368	15981.85	22.880	58299	6.034	112.2	4074.277	105043.2
P value	0.000	0.000	0.000	0.000	0.048	0.000	0.000	0.000

Table 1: Descriptive statistics

Before performing regression analysis, we examine descriptive statistics, which indicate no significant bias in the data. Skewness coefficients suggest that distributions are skewed to the right, and the kurtosis values exceed 3, implying leptokurtic distributions. The p-value (0.000) is less than 0.05, which means we reject the normality of these regression variables.

Stationary and autocorrelation Tests

The unit root test confirms that MEC is stationary, as the p-values for all tests, including the Augmented Dickey-Fuller (ADF) test, are below 0.05, ensuring model validity.

Variables	Stationary
TDA	STANIORAY IN SECOND
CASH	STANIORAY
DIV	STANIORAY
LEVERAGE	STANIORAY
MARGIN	STANIORAY
SIZE	STANIORAY IN FIRST LEVEL
TANG	STATIONARY
TURNOVER	STATIONARY
DIVERSITE	STATIONARY

Table 2: STATIONARITY TABLE

Table 3: Auto Correlation Between Variables

TDA	1.000000	-0.397119	-0.507584	-0.260830	-0.013375	0.492626	0.492736	0.630488	0.870853
CASH	-0.397119	1.000000	0.184280	0.561776	0.326569	-0.025636	-0.412305	-0.418253	-0.096246
DIV	-0.507584	0.184280	1.000000	0.174473	-0.051834	-0.138709	-0.121537	-0.188579	-0.445109
MARGIN	-0.260830	0.561776	0.174473	1.000000	-0.198020	0.097329	-0.187383	-0.641646	0.114668
SIZE	-0.013375	0.326569	-0.051834	-0.198020	1.000000	-0.139451	-0.385640	0.165257	-0.090169
ENGAG	0.492626	-0.025636	-0.138709	0.097329	-0.139451	1.000000	0.263825	0.069104	0.562866
TANG	0.492736	-0.412305	-0.121537	-0.187383	-0.385640	0.263825	1.000000	0.572742	0.336973
LEV	0.630488	-0.418253	-0.188579	-0.641646	0.165257	0.069104	0.572742	1.000000	0.239769
TURNOVER	0.870853	-0.096246	-0.445109	0.114668	-0.090169	0.562866	0.336973	0.239769	1.000000

Regression Analysis

OLS Regression

Using the Ordinary Least Squares (OLS) method, the results are as follows:

variables	coefficient	t student
c	3.69***	0.012
cash	-7.47***	0.000
div	-3.18***	0.041
margin	0.029	0.097
size	0.45	0.65
engag	2.30**	0.03
tang	-1.86	0.07
Lev	13.83***	0.000
turnover	19.53	0.000

Table 4: Significativity OLS

t<* 10% t<**5% t<***1%

Our adjusted R-squared is 0.98, indicating that the model explains a high proportion of the variance in the dependent variable and is globally significant. Furthermore, the Fisher statistic of 311.023 demonstrates a strong overall significance of the regression model. The residual analysis, with values generally less than 0.05, suggests that the independent variables effectively explain the model with a small unexplained portion representing the error term. Therefore, our model demonstrates a good fit to the data and appears robust.

Additionally, the Durban-Watson statistic is close to two, suggesting a low level of first-order autocorrelation that is unlikely to significantly bias our estimates. To address potential heteroscedasticity, we conducted the White test. Based on the results of this test, we proceeded with a random effects model.

The Hausman test yielded a p-value greater than 0.05, leading to the acceptance of

the null hypothesis (H0) and the rejection of the alternative hypothesis (H1). This statistically supports the appropriateness of using the random effects model over a fixed effects model for our data.

Our results are presented as follows:

Cash Ratio Representing immediate liquidity, the cash ratio has a significant negative impact on the debt ratio (t-statistic = -7.405). This finding suggests a positive indicator of the company's financial health. The availability of liquid assets appears to reduce the need for debt financing, consequently decreasing financial risk and indicating a stronger financial position. In this scenario, companies with higher cash reserves are less reliant on external financing and depend more on their internal resources. This signifies the efficiency of these companies in utilizing their assets and generating cash from operations, leading to a reduction in debt [20,21].

Dividend Payout Ratio: Furthermore, we found a significant negative effect between the dividend payout ratio and the debt ratio (t-statistic = -3.18). This implies that financially strong companies that generate higher profits tend to distribute more dividends, thereby reducing their reliance on debt financing. This result is supported by Asif et al. (2011) and Nguegan et al. (2024) [22,23]. On the other hand, this can also be interpreted as a positive signal indicating management confidence and stability, reducing dependence on external financing and potentially increasing shareholder satisfaction due to the availability of internal funds for distribution. Moreover, a strategy of distributing more dividends and utilizing less debt can be a positive sign for enhancing the overall financial structure.

Size and Margin: Other variables, such as size and profit margin, did not show a statistically significant impact on the debt ratio in our results. While these findings are not consistent with the results reported by many other authors, they are present in our specific research context.

Off-Balance Sheet Items (ENGAG): Also, the positive impact of ENGAG, measured by the ratio of off-balance sheet items to total assets (assuming "exchange" was a typo and meant "assets" or a similar base for the ratio), yielded a positive coefficient of 2.30. This finding aligns with Defant (1994), who found a positive correlation between debt and commitments [3].

Although tests did not indicate perfect multicollinearity, we detected a small degree of first-order autocorrelation between the residuals. To ensure the robustness of our results and address this potential issue, we employed the (GLM).

The GLM results corroborated the findings of the random effects model estimated with Ordinary Least Squares (OLS), confirming the persistence and stability of our key findings.

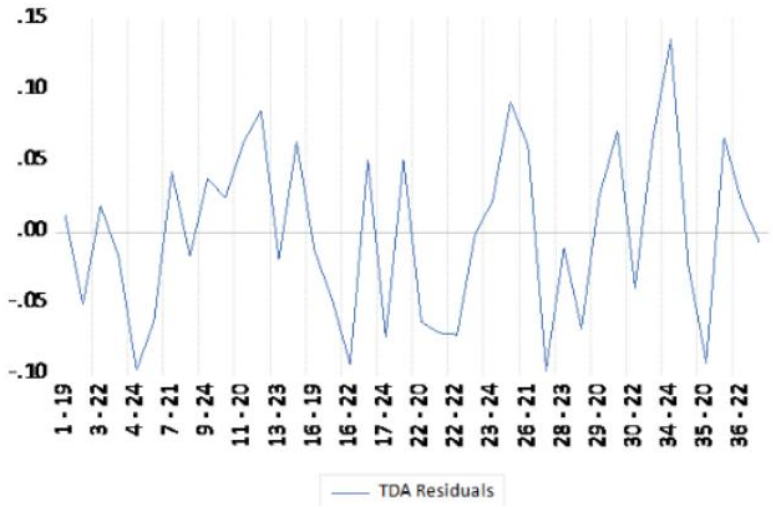

Figure1: Debt Ratio Residuals

Generelazid Linear Model Regression

variables	coefficient	t student
c	2.40**	0.016
cash	-5.765***	0.0000
div	-3.17***	0.015
margin	1.18	0.23
size	0.8377	0.40
engag	2.64**	0.0081
tang	-2.14**	0.031
Lev	9.51***	0.000
turnover	19.25***	0.000

Table 5: Significativity GLM

t<* 10% t<**5% t<***1%

We chose to use the Generalized Linear Model (GLM) because it allows us to specify a link function that is independent of the choice of the random component, providing greater flexibility in modeling the relationship between our variables.

Furthermore, our results indicate that leverage and turnover have a positive impact on the debt ratio, which can be interpreted as reflecting company growth. Achieving higher sales volume may necessitate the company taking on more debt to finance increased investment, expand inventory, and ultimately enhance returns for shareholders.

Moreover, the positive impact of ENGAG, measured by the ratio of off-balance sheet items to exchange volume (if "exchange volume" accurately reflects the intended denominator), suggests that these items represent a significant component of the company's financing structure. This positive coefficient of 2.64 could indicate the utilization of diverse financing tools. However, it is important to note that an increase in off-balance sheet items can potentially obscure future financial risks and reduce the transparency of the company's reported balance sheet. This positive correlation between debt and commitments is consistent with the findings of Defant (1994) [3].

The emergence of new forms of credit and ongoing financial innovation underscore the increasing importance of understanding the impact of off- balance sheet items on the debt ratio. This is because certain financial obligations and resources may not be directly reflected on the balance sheet but are instead disclosed within off-balance sheet items.

Conclusion

The preceding discussion underscores the increasing significance of understanding the interplay between credit commitments and debt ratios within an uncertain economic landscape and evolving financial practices. The literature review further highlights the complexity of this relationship, with various studies offering differing perspectives on the impact of off-balance- sheet items and other factors on debt and firm value. This background sets the stage for the subsequent empirical analysis, which aims to provide specific insights within the Tunisian market context.

Our results have implications for future research, particularly concerning the Basel III Accords. For example, these accords consider certain off-balance sheet commitments in the calculation of banks' regulatory capital, highlighting the recognized importance of these items in assessing financial risk. This understanding can inform the development of policies aimed at preventing over-indebtedness and maintaining the stability of the financial system [24-36].

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