FINANCING PATTERNS AND THEIR IMPACT ON INSTITUTIONAL DEBT - AN ECONOMETRIC STUDY USING PANEL DATA MODELS

Farid Boussafsaf[1], Ahmed Omane[2], Leila Mosbah[3].
[1]Abdelhamid Mehri Constantine2 University (Algeria).
[2]Abdelhamid Mehri Constantine2 University (Algeria).
[3]Abdelhamid Mehri Constantine2 University (Algeria).
The E-mail Author's: farid.boussafsaf@univ-constantine2.dz[1], ahmed.omane@univ-constantine2.dz[2], leila.mosbah@univ-constantine2.dz[3]

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ABSTRACT:
This study aims to identify different financing patterns available to institutions, which can be categorised into three different patterns: self-financing, external financing through banking products and borrowing through the financial market. These patterns were considered as explanatory variables that were tested for their impact on the debt ratio, which was considered as the dependent variable. The study was conducted on a sample of five UAE institutions from 2013 to 2018. For this purpose, the standard econometric modelling approach using panel data models was applied. The statistical results indicated the acceptance of the random effects model at the 1% level of significance, reflecting the existence of a relationship between the explanatory variables representing funding patterns and the dependent variable representing the leverage ratio. In addition, a statistically significant negative effect of self-financing and external financing patterns on the debt ratio was found at the 1% level of significance.

Keywords: Leverage, internal financing, banks, financial markets.

INTRODUCTION:
The decision to borrow externally or to use internal financial resources is a critical investment decision that can lead to varying degrees of success or failure for development programmes within an institution. The various forms of financing available in the financial market represent the ways in which an institution can obtain the necessary funds to carry out its activities and meet its obligations. The ultimate decision lies in choosing the best financial tool or instrument to revitalise or improve the financial situation and implement various programmes. We find that types of financing patterns vary in their characteristics and conditions for obtaining them, including two main patterns: those based on self-financing and those based on external financing. The former relies primarily on covering the financial deficit through internal resources, which we refer to as self-financing, and requires the reinvestment of profits

from previous financial cycles, or so-called retained earnings. The latter type relies on financing through credit or the financial markets.

Research problem:
In order to make a financing decision, an institution must compare the available sources that are appropriate to its financial situation and the sector in which it operates. It must first calculate its debt ratio, which gives a clear picture of the current situation, and then proceed to choose the appropriate financing pattern. This choice may have implications and consequences that we will try to uncover in our study, as well as trying to develop a standard model that captures all the relationships between different financing patterns and the debt ratio.

On the basis of the above, the main problem and several sub-questions can be formulated as follows:
What is the impact of different financing patterns on the debt ratio?
This problem includes a number of sub-questions, as follows:
- What is the nature of the impact of the self-financing pattern on the debt ratio?
- What is the nature of the impact of the pattern of external financing by banks on the debt ratio?
- What is the nature of the impact of the pattern of external financing through financial markets on the debt ratio?

Methodology:
In order to conduct a standardised study, it is necessary to identify the data source, data collection methods and data adjustments. In addition, the methodology and variables used should be determined, as well as the tests used for standard modelling.

Hypotheses:
The research problem and the questions posed lead us to formulate the following hypotheses:
1. There is no effect of the self-financing pattern on the debt ratio.
2. There is no effect of the external financing pattern through banks on the debt ratio.
3. There is no impact of the external financing pattern through financial markets on the debt ratio.

Objectives of the study:
Based on our research question, our main objectives are:
1. To attempt to measure the impact of financing patterns on the debt ratio.
2. To develop a model that allows institutions to choose the optimal mix of different self-financing and external financing patterns Internal or external funding.

1- The debt perspective and financing patterns

Different sources of financing are of great importance to economic institutions when making different investment decisions. Each source has advantages and disadvantages

that can positively or negatively affect financial analysis, in particular the debt ratio, which is the ratio of debt to total assets. Therefore, it is important to first understand the different sources of financing and to mention their main characteristics that will be useful in the future.

One of the main sources of financing is self-financing, which involves using the company's profits or selling assets to finance its activities. This method has several advantages, including no debt obligations and therefore no financial costs or liquidity pressures. However, it can also have disadvantages, such as restrictions on growth due to financial and tax constraints and reduced liquidity.

Then there is external financing, which involves borrowing from banks or issuing bonds. The advantages of this source include the ability to provide large amounts of capital quickly, allowing the company to undertake major projects without using its own capital. However, it involves financial costs, including interest and borrowing costs, which can affect the company's profitability and increase its debt.

Partner or investor funding involves raising capital from external investors in exchange for ownership or profit shares. The advantages of this source are the capital and resources needed for project development and the absence of financial commitments. However, the company may face challenges in terms of losing control over decisions or sharing profits with partners.

Each source of funding therefore has its own set of advantages and disadvantages that need to be considered when making investment decisions. The institution must analyse and evaluate each source based on its financial and operational needs and objectives.In the following, we will discuss the theoretical framework for both the aforementioned financing patterns and the debt ratio.

1-1 Funding patterns

Funding is considered the cornerstone of any economic institution, as it has a significant and effective impact on all other functions. Institutions seek to raise funds to carry out their activities and expand their scope.To achieve this, these institutions seek appropriate and available sources of finance to meet their needs.Sources of funding can be either internal or external, allowing institutions to compare them and choose the appropriate mix of funding to meet their overall objectives.

1-1-1 Internal or self-financing

Self-financing enables the institution to meet the financial needs required to repay debt, make investments and increase working capital. In simple terms, self-financing is the traditional source of financing for the institution, and it is fuelled either by the premiums associated with the participation of shareholders when the institution issues shares, which can be sold at a value higher than the nominal value, or by the internal

financial resources resulting from the partial or total reinvestment of profits, as well as depreciation and provisions (Bouras., 2008).

1-1-2 External financing (short-term and long-term)

Short-term financing refers to funds obtained by the institution from external sources that are usually repaid within a period of not more than one year. This funding is generally used to finance operating activities (Al-Hindi, 1998) . It is available to investors or institutions to finance available investment opportunities. It represents a short-term commitment for the institution, which must be fulfilled within a period that usually does not exceed one year. On the other hand, long-term financing is used by the institution to cover investment activities that require a longer time frame (Al-Zughbi, 2000) . Long-term financing sources are diverse and include long-term bank loans obtained from financial institutions, issuing bonds, selling shares and others. It should be noted that it is not necessary for an institution to rely on all these sources of finance. Rather, each institution chooses its financing sources based on the nature of its projects and financial needs (Mohammed Antar Ahmed, 2019).

1-2 Debt Ratio

This ratio is used to analyse the financing policy, that is, the extent to which the institution relies on debt to finance its assets (Hussein, 2019). An increase in the level of debt beyond the optimal limit and difficulties in its utilisation lead to a deterioration in the performance and financial fragility of the institution. This reveals the burden of financial distress, such as interest expenses and additional fees to lenders, and opens the possibility of the institution not obtaining loans, which affects future investment opportunities (Boudeyaf, 2018). One of the most important ratios in this regard is the debt-to-total-assets ratio, which measures the extent to which the company relies on creditors and loans to finance its assets. Creditors prefer a low ratio as it indicates the company's ability to repay its debts
It is calculated as follows:

The total debt/total assets

2- Field framing of the research variables

This section focuses on describing and analysing the research axes and testing the hypotheses adopted, as follows:

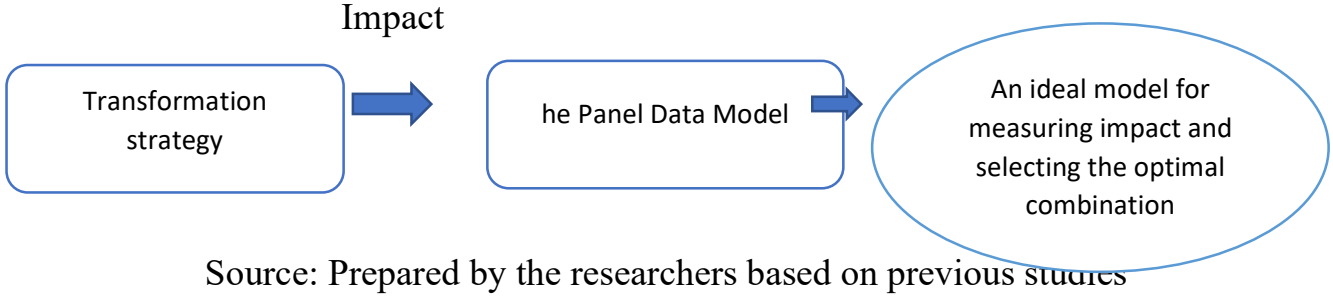
2-1- Model, method, sample and research tool

The study will deal with the hypothetical model and the methodology adopted, as well as the sample selected and the research tool used to carry out statistical analysis procedures.

2-1-1- Study model

The research model consists of four variables. The independent variables represent three patterns (internal financing, external financing through banks or through the capital market), while the dependent variable represents the ratio of debt to total assets of the institution. The proposed model of the study is illustrated in Figure (1):

Figure (1): Proposed study model



Source: Prepared by the researchers based on previous studies

2-1-2- Research methodology

The descriptive-analytical methodology was adopted in order to familiarise and cover various aspects of the study. It involves the collection of data and information relating to the subject of the study in order to provide a precise description of the concept of both the funding strategies and the indebtedness of the institution. The standard methodology was also used to place the subject matter in a real context.

2-1-3- Research sample:

Five companies were selected as the sample for the study: one company operating in the service sector, three companies operating in the real estate sector and one company operating in the transport sector.

2-1-4- Research tool:

In order to carry out this standardised study, panel models and multiple linear regression using the method of least squares within the framework of Markov chain theory were used.

2-2- Descriptive statistics and correlation matrix for the standard study:

Before proving the previous hypotheses, it is necessary to first present the descriptive statistics of the data studied, as well as the interrelationship matrix between all the

variables, in order to provide a comprehensive overview and preliminary ratios of the relationship between the explanatory and dependent variables.

2-2-1- Descriptive statistics of the standard study data:
The following table presents the mean, standard deviation, minimum and maximum values for each variable.

Table (1): Descriptive Statistics of Standard Study Data

Variables		Mean	Standard deviation	Minimum value	Maximum value	The number of observations
RDTA	Overall		0.0452192	0.047151	0.2391253	Observations = 30 Companies = 5 Years = 6
	Between		0.0295682	0.0955935	0.1678265	
	Within		0.0363487	0.0700661	0.2192524	
SF1	Overall	2171749	3527986	0	1.22e+07	Observations = 30 Companies = 5 Years = 6
	Between		3295269	0	7990387	
	Within		1860134	-5818638	6345309	
SF2	Overall	1591649	1694102	151225	6417898	Observations = 30 Companies = 5 Years = 6
	Between		1683357	378242.7	4538019	
	Within		724470.9	141309.7	3471528	
SF3	Overall	110122.8	436814.9	0	2381000	Observations = 30 Companies = 5 Years = 6
	Between		173558.4	0	396833.3	
	Within	0.1272387	40728106	286710.6	2094289	

The source of the data presented in Table 01 is the researchers' own work, using the statistical software STATA 15.

Based on the data presented in Table 01, the results can be summarised as follows: The total number of observations was 30, spread across all categories. The mean of the study sample for the ratio of debt to total assets was 0.1272387, and the mean of reinvested profits was 2,171,749 Saudi Riyals. In addition, the average of prohibited loans for the studied institutions was 1,591,649 Saudi Riyals, and the average value of stocks and bonds traded in the Saudi financial market was 110,122.8 Saudi Riyals.

2-2-2- Correlation matrix of the study variables:

Table (2): Correlation matrix of all variables

	RDTA	SF1	SF2	SF3
RDTA	1.0000			
SF1	-0.1467	1.0000		
SF2	0.1994	0.6170	1.0000	
SF3	0.1606	-0.1479	0.5218	1.0000

The source of the data presented in Table (2) is the researcher's own work, using the statistical software STATA 15.

Based on the results of the correlation matrix in Table (2), the total correlation between the independent variables and the dependent variable is 50.67%. This correlation is considered strong as it is more than 50%, which indicates a strong relationship between different financing patterns and debt-equity ratio.

3- Measuring and analysing the impact of financing patterns on the debt ratio and testing hypotheses

Debt is expressed as the dependent variable as follows
Y1: Ratio of debt to total assets (RDTA).
Financing patterns are expressed by the following explanatory variables
x1: Internal financing pattern (reinvested profits) (SF1),
x2: External financing pattern through bank loans (SF2),
x3: External financing pattern through debt on the capital market (SF3).

3-1- Detection tests for the standard survey data

In this section we will try to identify the possible presence of various statistical problems by performing determination tests on the standard model related to our study.

3-1-1- Normality test

Table (3): Results of the Jarque-Bera test for normality

Acceptance or rejection of H0	Probability	Chi (2)
Accepted	0.3165	2.301

The source of the data presented in table (3) is the researchers' own work, using the statistical software STATA 15.

Based on the results of the Jarque-Bera test for residuals, it can be seen that the chi-square value for the panel model is small, and therefore the p-value for JB is above the

acceptable level. This leads us to accept the null hypothesis (H0) and conclude that the residuals of the panel model follow the usual normal distribution.

3-1-2- Multicollinearity test:

The variance inflation factor (VIF) measures the degree of multicollinearity (Damondar, 2015)

Table (4): Results of Multicollinearity Test

Interpretive variables	NDSF2	NDSF1	NDSF3	Mean VIF
	4.25	3.16	2.69	3.37

The source of the data presented in Table (4) is the researchers' own work, using the statistical software STATA 15.

Based on the results of the multicollinearity test presented in Table (4), it can be observed that the Variance Inflation Factor (VIF) values for the explanatory variables are less than 10. This indicates that there is some partial linear dependence between the variables, but it does not threaten the validity of the model.

3-1-3- Heteroscedasticity test:

Table (5): Heteroscedasticity test results

The statistical value for (3, 26) F-test	The probability value Prob > F	Test of hypothesis for significance
Accepted	0.38	0.7651

The source of the data presented in Table (5) is from the researchers' own work, using the statistical software STATA 15.

Based on the previous results in Table (5), it is evident that there is heteroscedasticity, indicating that the estimated parameters are efficient. This suggests that the hypothesis tests will be accurate and these models can be used for forecasting due to their high credibility.

3-2- Estimation results of the three models (pooled, fixed, random) and hypothesis tests:

The following table summarises the results of estimation within the panel model.

Table (6): Panel model estimation results

Dependent Variable: Debt to Total Assets Ratio (RDTA)

Interpretive Variables	**Aggregate Regression Model**	**Fixed Effects Model**	**Random Effects Model**
SF1	(0.024) -2.29e-6**	(0.405) $1.42e^{-6}$	(0.000) $-1.15e^{-6}$***
t-statistic / z:	-2.39	0.85	-4.38
SF2	(0.023) 5.57e-6**	(0.004) $8.36e^{-6}$***	(0.001) $5.59e^{-6}$***
t-statistic / z:	2.41	3.27	3.40
SF3	(0.174) -9.99e-6	(0.816) $1.73e^{-6}$	(0.000) $-6.13e^{-6}$***
t-statistic / z:	-1.40	0.24	-4.48
Intercept	-0.2600819	--	-0.5320086
Firm (dummy1)	--	(0.290) 0.5262934	--
Firm (dummy 2)	--	(0.706) 0.1756061	--
Firm (dummy 3)	--	(0.056) 0.9672714*	--
Firm (dummy4)	--	(0.058) -3.7418*	--
Firm (dummy 5)	--	(0.005) -1.125687***	--
F-test	(0.0917) 2.39*	(0.0037) 4.34***	(0.000) 551.83***
Degrees of Freedom	3/26	7/22	3/26
R^2	0.2161	0.4460	0.2681
SSE (SRMSE)	0.95103	0.75704	--
sigma_u	--	--	0.8933049
sigma_e	--	--	0.7570378
Rho	--	--	0.58200986
Significance values ***: p<0.01 (significant at the 1% level)**: p<0.05 (significant at the 5% level) *: p<0.10 (significant at the 10% level)			

Source: Prepared by the researchers on the basis of the results of the statistical software STATA 15.

On the basis of the estimation results presented in Table (6), we can make the following analysis:

3-2-1- For the pooled model:

The p-value for this model was found to be 0.0917, which corresponds to a percentage of 9.17%. The F-statistic value was 2.39, which is lower than the critical values estimated at 5.44, 2.46 and 2.01 for acceptable levels of significance of 1%, 5% and 10% respectively. This places it in the region of acceptance of the null hypothesis and rejection of the alternative hypothesis. Therefore, using this model, there is no statistically significant relationship or effect between the explanatory variables

representing the financing strategies and the dependent variable representing the debt to total assets ratio.

3-2-2- For the fixed effects model:

Based on the results shown in the previous table (6), we can see that this model has an acceptable level of significance at 1% (p-value = 0.0037). It also shows a good fit to the study data compared to the pooled model. This is evidenced by the increase in the F-statistic value from 2.39 to 4.34, exceeding the critical value of 3.59, which places the hypothesis test for the validity of this model in the region of accepting the alternative hypothesis (H1) and rejecting the null hypothesis (H0). This indicates that there is at least one explanatory variable representing financing patterns that has a statistically significant relationship or effect with the dependent variable representing the ratio of debt to total assets. In addition, the coefficient of determination (R^2) has increased to 0.4460, which is 44.60%, indicating a good and acceptable percentage of explanatory power for the model.This increase is mainly due to the inclusion of dummy

variables, so we can say that 44.60% of the variation in the debt-to-total-assets ratio can be explained by the data on financing patterns, together with the dummy variables, while the remaining part is due to other factors.

3-2-3- For the random effects model:

Based on the estimation results shown in Table (6), it is evident that the random effects model has a statistically significant level at 1% (p-value = 0.000). It also shows a good fit to the study data compared to the pooled regression model and the fixed effects model. This is indicated by the calculated value of 551.83, which exceeds the critical value for a degree of freedom (df) of 3, estimated at 0.11. Consequently, the hypothesis test for the validity of this model is in the region of accepting the alternative hypothesis (H1) and rejecting the null hypothesis (H0). This indicates that there is at least one explanatory variable representing financing patterns that has a statistically significant relationship or effect with the dependent variable representing the ratio of debt to total assets.

4- Panel model comparison tests:

How do we determine whether there are fixed and/or random effects in the panel data of the study? Three tests can be performed to answer this question. The fixed effects model is tested using the F-test, where it is compared with the pooled OLS model to determine the best model to explain the study. The random effects model is tested using the Breusch-Pagan Lagrange Multiplier (LM) test (Breusch & Pagan, 1980). The results are then compared with the pooled OLS model. The choice between random effects and fixed effects models is determined by the Hausman test (H M, 2011).

4-1- F-test:

Having accepted the Least Squares Dummy Variable (LSDV) model to represent the fixed effects between pairs, we apply an F-test to compare it with the previously estimated pooled OLS regression model.This test either accepts or rejects the null hypothesis (H0) that there are no fixed effects for all but one of the dummy variables.If the F-test value is statistically significant at a level greater than 5% (i.e. p-value > 0.05), then H0 is accepted and the pooled OLS model is preferred to the fixed effects model.However, if the F-test value is statistically significant at a level less than 5% (i.e., p-value < 0.05), then H0 will be rejected and H1, which suggests the presence of fixed effects that can be represented by the LSDV model (Damondar, 2015), will be accepted. Therefore, the results of the F-test are presented in the following

Table (7): F-test for comparison between pooled OLS and LSDV models.

The companies	Firme (1)	Firme (2)	Firme (3)	Firme (4)	Probability
Dummy variables	d1=0	d2=0	d3=0	d4=0	0.0064***

Source: Prepared by the researchers using the output of the statistical software STATA15.

Based on the results of the F-test in Table (7), we reject the null hypothesis H0 and accept the alternative hypothesis H1. We can conclude that the fixed effects model using Least Squares Dummy Variable (LSDV) is the preferred model compared to the pooled model in estimating the impact of financing strategies on the leverage ratio.

4-2- Breusch-Pagan Lagrange Multiplier (LM) test:

The Breusch-Pagan LM test tests for the presence of random effects. The null hypothesis H0 for this test assumes the absence of heteroskedasticity in the random error deviations for each institution. If this hypothesis is not rejected, the pooled model is accepted. Otherwise, the random effects model is preferred (Damondar, 2015). The results of the LM test are presented in the following

Table (8): Results of Breusch-Pagan LM test for panel data.

Estimation results			
RDTA		1.034483	1.017095
e/ σ_v		0.5731062	0.7499758
u/ σ_u		0.7979936	1.397688
test var$_u$ = 0			
Chibar2 (01)		3.18	

Probability		0.0374**

The source: Prepared by the researchers using the output of the statistical software STATA 15.

Based on the results in Table (8, the null hypothesis H0 is rejected, indicating a preference for the random effects model over the pooled model.

4-3- Hausman test:

The Hausman test examines whether "the random effects estimate is significantly different from the fixed effects estimate" (Kennedy, 2008). This test aims to detect the absence of correlation between the individual effects and the explanatory variables. If H0 is accepted, the random effects model is preferred to the fixed effects model. Conversely, if H0 is rejected, the alternative hypothesis H1 is accepted (Damondar, 2015). The following

Table (9) presents the results of the Hausman test.

Results of estimation	Fixed Effects Model	Random Effects Model
Chi-sq(2)	1.034483	
Probability	0.5731062	

The source: Prepared by the researchers using the results of the statistical software STATA 15.

Based on the results of the test shown in Table (9), the null hypothesis is accepted with a percentage of 57.31%. This led us to select the random effects model as the preferred model to explain the impact of financing patterns on the debt-equity ratio.

5- Final algebraic formula of the optimal panel model and analysis of the results:

After conducting the comparative tests between panel models, which led us to choose the random effects model as the preferred model to explain the impact of financing patterns on the debt-to-assets ratio, we derived the final algebraic formula. We will now analyse its various coefficients.

$$NDRDTA = -0.5320086 - 1.15e^{-6}\ NDSF1 + 5.59e^{-6}\ NDSF2 - 6.13e^{-6}NDSF3 + u_i + v_{it},$$

where $u_i \sim IID(0\ , 0.8933049)$, and $v_{it} \sim IID(0\ , 0.7570378)$

5-1- Analysis of the parameters of the random effects model:

The parameters α and ρ represent the components of the random error variances of the institutions. Their respective values indicate deviations from zero and serve as indicators of the presence of individual effects affecting the random error. These effects are different for each institution and remain constant over time. The value of ρ, which

is equal to 0.58200986, means two things: first, it indicates the fit of the model to the data, with higher values indicating a better fit. Second, it represents the proportion of the individual random errors that contribute to the total composite random error variation of the model. In other words, in this model, 58.20% of the random errors for the institutions can explain the variation in the total composite random error. This is one aspect.

On the other hand, the explanatory variable for internal financing patterns (NDSF1) has a probability value of 0.00% (P=0.000), indicating strong statistical significance at the 1% level.

This means that the null hypothesis for this variable falls in the rejection region and we therefore accept the alternative hypothesis that there is an effect of internal financing patterns on the debt ratio. However, the sign of the coefficient indicates an apparently negative impact.However, we cannot make a definitive judgement based on this result alone, as the original data have been transformed into standardised data using the NORMALISEDDATA method to address the issue of non-normal distribution of the

model. Therefore, this negative sign does not really reflect the true relationship between the variables and should be adjusted using the following inverse equation:

$$X = (Z \times \sigma^2) - \bar{X}$$
$$X = (Z \times 0{,}199108179505095) - 0{,}193517812082156$$

If we assume that for each unit increase in internal financing (NDSF11), the debt-to-asset ratio decreases by 0.00000115, based on the original equation, we can obtain the actual value using the inverse adjustment.

$$RDTA = (NDRDTA \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = (-0{,}00000115 \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = -0{,}193518041056563$$

Therefore, we can perform an inverse analysis of the relationship between internal financing patterns and the debt to total assets ratio. It shows a negative impact of internal financing on the debt ratio. For each unit increase in internal financing based on reinvested profits (i.e. internal financing), the debt ratio decreases by 0.1935.
As for one unit of internal financing, NDSF1, it is equal to the following value after inverse adjustment

$$SF1 = (NDSF1 \times 457174{,}877264921) - 390966{,}933333333$$
$$SF1 = (1 \times 457174{,}877264921) - 390966{,}933333333$$
$$SF1 = 66207{,}9439315876$$

Therefore, the reinvestment of distributed profits worth 66207.94 SAR leads to a decrease in the debt ratio of 0.1935, which means that for every 10,000 SAR invested from reinvested profits, the debt ratio decreases by 2.92%.
Regarding the second explanatory variable, NDSF2, it shows positive and statistically significant results with a probability value of 0.1 (0.001=P). This indicates that the null hypothesis for this variable is in the rejection region, suggesting an impact of external bank financing on the debt ratio. As for the sign of the coefficient B, it appears to be positive, but we cannot make a definitive judgement based on this result alone, as the original data have been transformed using the NORMALISEDDATA method to address the problem of the non-normal distribution of the model.
Therefore, this positive sign does not accurately reflect the true impact between the variables and should be adjusted using the following inverse equation.

$$X = (Z \times \sigma^2) - \bar{X}$$
$$X = (Z \times 0{,}199108179505095) - 0{,}193517812082156$$

Where X is the original value of the dependent variable and represents the value of the variable after adjustment.

If we assume that for each unit increase in external financing by banks (1 - NDSF2), the ratio of debt to total assets decreases by 0.00000559 based on the original equation, we can obtain the actual value using the inverse adjustment.

$$RDTA = (NDRDTA \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = (0{,}00000559 \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = -0{,}1935166373438969$$

We can therefore analyse the relationship between external financing through banks and the ratio of debt to total assets in the opposite direction. First, there seems to be a negative effect of external financing on the debt ratio. For each unit increase in bank financing (i.e. one unit increase in NDSF2), the debt-total assets ratio decreases by 0.1935. However, this analysis may seem unrealistic, so we need to perform the inverse adjustment to obtain the value of one unit of external financing, NDSF21. After the inverse adjustment, the value of NDSF21 is

$$SF2 = (NDSF2 \times 801884{,}486583934) - 1276404{,}43333333$$
$$SF2 = (1 \times 801884{,}486583934) - 1276404{,}43333333$$
$$SF2 = -474519{,}9467494$$

Note that this result has a negative sign, which is the same sign as the coefficient on the change in the debt ratio. This is clear evidence that there is an inverse relationship between bank financing and the debt ratio, and that the effect is positive. Therefore, we can say that investing 474519.94 Saudi Riyals will lead to an increase in the debt-equity ratio of 0.1935. In other words, borrowing 10000 Saudi Riyals from the bank will lead to an increase in the debt-to-total assets ratio by 0.004 or 0.4%.

The last explanatory variable, NDSF3, also shows positive results in terms of statistical significance, as evidenced by its probability value of 0.00 (0.000 = P), which indicates that the null hypothesis for this variable falls in the rejection region. Thus, there is an effect of external financing through the financial market on the ratio of debt to total assets. As for the coefficient B, it seems to have a negative effect, but we cannot make a definitive judgement on the basis of this result. The original data have been transformed into normalised data using the NORMALISEDDATA method in order to solve the non-normal distribution problem of the model. Therefore, this negative sign does not accurately reflect the true effect between variables and should be adjusted using the following inverse equation:

$$X = (Z \times \sigma^2) - \bar{X}$$
$$X = (Z \times 0{,}199108179505095) - (0{,}193517812082156)$$

Where X is the value of the original dependent variable and it is the value of the dependent variable after adjustment.
If we say that for every unit increase in external financing through the markets (NDSF31), the ratio of debt to total assets increases by 0.00000613 based on the original equation, we can obtain the actual value using the inverse adjustment:

$$RDTA = (NDRDTA \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = (-0{,}00000613 \times 0{,}199108179505095) - 0{,}193517812082156$$
$$RDTA = -0{,}193519032615296$$

Therefore, we can subsequently analyse the relationship between external financing through the financial market and the ratio of debt to total assets. We can conclude that there is a negative effect of external financing through the financial market on the debt-to-total-assets ratio. When the external financing relying on financial markets increases by one unit (1 = NDSF3), the debt-to-total-assets ratio decreases by 0.1935. In other words, obtaining 10,000 Saudi Riyals worth of financing from the financial market leads to a 0.0091 or 0.91% decrease in the debt-to-total-assets ratio.

$$SF3 = (NDSF3 \times 397239{,}318695039) - 186667{,}033333333$$
$$SF3 = (1 \times 397239{,}318695039) - 186667{,}033333333$$
$$SF3 = 210572{,}285361706$$

Finally, the constant term with a value of 0.5320086 in this model represents the estimate of the parameter (NDRDTA) in the absence of explanatory variables and fixed random error components that reflect the unobservable heterogeneity between institutions.

According to the characteristics of the random effects model, each institution has a unique value that distinguishes it from other institutions, and this value is bounded between hi and hi, which constitute the components of the random error variance of the institutions.The value of this constant term also needs to be inverted to reveal its true

value.By using the following inverse equation, the adjusted values of the constant term are displayed:

$$Intercept = RDTA$$
$$= (NDRDTA \times 0{,}199108179505095) - 0{,}193517812082156$$
$$Intercept = (-0.5320086 \times 0{,}199108179505095) - 0{,}193517812082156$$
$$Intercept = -0{,}299445075909211 + u_i + v_{it}$$
$$where\ u_i \sim IID\,(0\ ,0.01102497),\ and\ v_{it} \sim IID\,(0\ ,0.01909681)$$

After completing all the tests and estimations related to the panel model, the final results of the hypothesis testing are presented in the following table.

The dependent variables:	Independent variables:	The optimal model	Accepted study hypotheses:
Debt-to-Total Assets Ratio (RDTA)	- Internal Financing (SF1)	Random Effects Model	- H1: There is a negative impact of SF1 on RDTA.
	- External Financing (Banks) (SF2)		- H2: There is a positive impact of SF2 on RDTA.
	- External Financing (Financial Market) (SF3)		- H3: There is a negative impact of SF3 on RDTA.

Source: Prepared by researchers based on the results of the standard study.

CONCLUSION:

This study aimed to analyse the impact of financing patterns on the ratio of debt to total assets of economic institutions. The study produced the following standard results:

STANDARD RESULTS:

There is a negative effect of internal financing strategy on debt to total assets ratio. For every 10,000 Saudi Riyals increase in financing through reinvested profits (i.e. internal financing), the debt to total assets ratio decreases by 2.92%.

External financing through banks has a positive effect on the debt ratio. For every 10,000 Saudi riyals increase in bank financing, the ratio of debt to total assets increases by 0.4%.

There is a negative effect of external financing through financial markets on the debt ratio. For every 10,000 Saudi riyal increase in financing through financial markets, the debt-to-total assets ratio decreases by 0.91%.

RECOMMENDATIONS:

Based on the above findings, the following recommendations are proposed:

To ensure a low debt to total assets ratio, institutions should adopt a diversified funding strategy that combines different available funding patterns.

This strategy should include the use of internal financing to provide financial comfort to owners and allow them to enjoy their profits, as well as the use of bank financing, which can provide investment opportunities beyond the financial capacity of project owners and thus provide sufficient financial support at the right time.

In addition, institutions can use the financial market to expand and develop their investment projects without negatively affecting their debt ratio.

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