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The impact of off-balance sheet activities on banks performance -The case of Société General Algérie bank -

أثر عمليات خارج الميزانية على أداء البنوك -حالة بنك سوسييتي جنرال الجزائر-

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Abstract

The growth of the bank's off-balance sheet activities led the specialists to view the banking activity as two types of activities: a visible regulatory activity and a hidden one. The growth of these activities that do not appear in the bank's balance sheet is the result of banks seeking to use excessively the leverage achieved by such activities.

This study aims to analyze the impact of off-balance sheet operations on some of the bank's performance indicators, namely: total assets, net income, net interest margin, loans, and, equity, on Société General Algérie bank for the period 2004-2019. The results show a significant positive relationship between off-balance sheet activities and the performance indicators included in the study.

Keywords : Off-balance sheet activities, Banks performance, Algerian banking system.

ملخص

إن النمو المتسارع لأنشطة خارج الميزانية جعل المختصين ينظرون إلى النشاط المصرفي على أنه ينقسم إلى نوعين: نشاط تنظيمي ظاهري ونشاط آخر خفي. إن نمو هذه الأنشطة التي لا تظهر في ميزانية البنك هو نتيجة سعي البنوك للاستخدام المفرط للرافعة المالية التي تحققها هذه الأنشطة.

تهدف هذه الدراسة إلى تحليل أثر عمليات خارج الميزانية على بعض مؤشرات أداء البنك، والتي تتمثل في: إجمالي الأصول، صافي الدخل، صافي هامش سعر الفائدة، القروض وحقوق الملكية، تمت هذه الدراسة على بنك *Société General Algérie* خلال الفترة 2004-2019. أظهرت النتائج وجود علاقة إيجابية ذات دلالة إحصائية بين أنشطة خارج الميزانية ومؤشرات الأداء المدرجة في الدراسة.

الكلمات المفتاحية: عمليات خارج الميزانية، أداء البنوك، النظام البنكي الجزائري.

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1. INTRODUCTION

The global financial system has undergone many profound transformations that have led to many changes in the way financial institutions operate. All these changes are due in particular to the phenomenon of globalization, especially financial globalization, and the accompanying wave of financial liberalization and the dominance of the idea of moving towards financial markets and its increasing importance. Financial globalization has affected both financial markets and banking systems alike, as banks have responded to these profound transformations by focusing on financial innovation that was the most prominent result of this financial globalization since the seventies of the last century, these financial innovations brought a qualitative and quantitative shift in the nature of the banking institutions activities and business models.

The most prominent developments in the banking sector activity that were included in the financial innovation process, is the significant development witnessed by the bank's off-balance sheet activities. These activities have been greatly enhanced and diversified to the extent that their size has become many times more than the size of the traditional activities or what is known as on-balance sheet activities. Off-balance sheet is a heterogeneous set of activities that do not appear in the bank’s balance sheet and are not limited to those items that are included in the off-balance schedule stipulated by the banking accounting system, but rather in its broad concept include many of the operations that the bank performs through off-balance bodies such as securitization, investment funds, etc., whose growth has increased in previous years as a result of banks seeking to use excessively the leverage achieved by these activities, and because they are not subject in their entirety to the same rules and regulations embodied in the matter of precautionary rules.

The growth of the bank's off-balance sheet activities led the specialists to view the banking activity as two types of activities: a visible regulatory activity that is subject to the rules and regulations covered by the bank’s on-balance sheet, and another activity that does not appear called the shadow banking system that became by its magnitude a threat to the financial stability as a result of difficulty in controlling it, and was a reason of the periodic amendments that affect the banking rules similar to the Basel agreements.

2. Literature review

According to several studies, off-balance sheet operations are affecting the banks' activity by way or another. The study of (Aktan, Chan, Žiković, & Evrim-Mandaci, 2013) examined the effect of off-balance sheet activities on the performance of the banks that are listed on Istanbul Stock Exchange, where they used 4 measures of performance that included: leverage, profitability, liquidity position, and bank's risk exposures which they divide into bank-specific risk and foreign exchange rate risk. This study found that off-balance sheet activities increase both bank-specific and foreign exchange risk exposures of the banks in Turkey. It also found that off-balance sheet activities improve bank's stock returns due to its hedging perception, but have a negative impact on return on equity ratio. In addition, off-balance sheet activities, according to the study, do not have a statistically significant impact on leverage or bank's liquidity.

(Kashian & Tao, 2014), also studied the relationship between off-balance sheet activities (represented by loan commitment) and community bank performance. The empirical results of the study showed that the use of loan commitments is generally associated with moderate increase in profitability and higher insolvency risk. According t(Benahmed-Daho)o this study, the use of loan commitments is more risky for community banks that concentrate and focus more on loans related to real estate, while it is safer for community banks with higher equity. The study confirmed that more concentrated loan portfolio results in lower return and higher insolvency risks, and high loan growth generates higher return and higher risks, in regards to the performance of community banks' balance sheet loan activities.

Another study of (Middi, 2016) analyzed the performance and measured the risk of the Indian banks that witnessed off-balance sheet exposures such as foreign exchange contracts, guarantees, acceptances, interest rate swaps, and other derivatives. The off-balance sheet activities have led the banks to expose to greater risks, but with incremental revenues in the form of other incomes.

(Hou, Wang, & Li, 2014) studied the role of off-balance sheet operations on China's banking sector. They found that banks can realize more scale economies by increasing their off-balance sheet operations than by increasing other outputs, especially, banks with low profitability, small

size and non-state-ownership.

The study of (Papanikolaou & Wolff, 2014), on the role of both on and off-balance-sheet leverage of banks in the 2008 crisis, found that both explicit and hidden off-the-balance-sheet leverage increases the individual risk of banks making them vulnerable to financial shocks. However, reverse leverage found to be beneficial for individual banks' health, but harmful for financial stability. The study demonstrated that the banks which concentrate on traditional lines of business typically carry less risk compared to those involved in modern financial instruments.

The findings of (Swain & Panda, 2017) revealed that there is a positive and highly significant relationship between net profit and off-balance sheet activities of Indian private sector banks. The study also found that in case of private sector banks, the capital to risk weighted assets ratio and liquidity to total assets, positively affect the off-balance sheet activities, whereas net non-performing assets negatively affect the off-balance sheet of private sector banks.

The study of (Olaniyi, Abdullah, & Ayadurai, 2019) examined the factors influencing the off-balance sheet activities of selected Malaysian commercial banks. The study built its analysis on three main recognized determining factors namely: liquidity motives, credit risk transfer motive, profitability motives, and capital arbitrage motive. The findings of the study suggested that the selected banks mainly used off-balance sheet instruments for capital arbitrage purpose, enhancing operational efficiency and managing loan portfolio risks. The findings further suggested that its usage for capital arbitrage purposes may undermine the regulatory measures of accurately estimating and monitoring the risk of banks. The findings thus offer significant practical and policy implications that can help to enhance financial stability.

The study of (Benahmed-Daho, Bouteldja, & bendob, 2015) aimed to investigate the impact of financial liberalization (including the openness to financial markets and the abolition of barriers and constraints) on banking efficiency in Algeria. Using three varieties of a panel data regression model on a sample of 10 Algerian commercial banks (public and private) for the period during 1998-2012. the results showed a negative and significant impact of financial liberalization on Algerian banking profitability (ROA and ROE), but there were a positive relationship with a statistical

significance with net interest margin.

The banking sector in Algeria has progressed significantly in many areas. In the side of regulation and laws, the Algerian banks have witnessed several reforms and laws in order to liberalize their activities and determine their policy independently, in addition, the Algerian market has been opened to the private and foreign investment. Therefore, these reforms had a positive impact on the banks' performance, wherein, the banks' assets have increased to accompany the economic development, they increased their capacity to collect the deposits, and they granted more credit to finance the economy. As results, these activities increased the banks' profitability, on the other hand, the banks in Algeria have reduced the credit risk by reducing the level of the non-performing loans (Hacini & Dahou, 2018, p. 163).

Research Gap and Statement of the Problem

There are many studies on off-balance sheet operations and their impact on the banks' activity and performance. However, there is almost no study on this subject in Algeria. Therefore, this study bridges that gap, and one of its peculiarities is that it studies the relationship between off-balance sheet operations and the performance of Algerian commercial banks. The special nature of the Algerian banking system makes this study an addition. This study was applied on one of the largest private commercial banks in Algeria in terms of the size during the period 2004 to 2019. Hence the following question is lying ahead: How do off-balance sheet operations affect the banks' performance?

3. Research design

3.1. Data: Our empirical analysis is based on a data set that consists of Société General Algerie bank, which is a private commercial bank. The bank has been selected primarily based on its' position in the Algerian banking sector -which is considered the number one private commercial bank by size in Algeria-. It is also selected because it gives a better understanding to the topic than the public banks that don't necessarily work by the international standards. While the private bank provides a clear idea of the operation of the banking system in reality.

The data we employ in our analysis are of annual frequency and cover the period 2004-2019.

The study is mainly based on secondary data. Secondary data sources were the reports of Algeria Bank, and the annual reports, and financial

statements, of the Société General Algerie bank, which were obtained from the bank's website.

3.2. Method: The study is empirical in nature which attempts to analyze the impact of off-balance sheet operations on some of the bank's performance indicators, an estimation technique is used namely a simple linear regression model, and for the purpose of the study, we use the ordinary least squares OLS method.

4. Empirical analysis

To analyze the affect of off-balance sheet operations on some of the bank's performance indicators, a simple linear regression model has been estimated. In this section, we will present the estimated model and do some diagnoses to confirm its reliability.

4.1. The model: To evaluate the effects of off-balance sheet operations on individual bank's activities, we estimate the following model:

$$Y = \alpha + \beta * OBS + \varepsilon$$

Where: OBS is the off-balance sheet operations, ε is the regression error term, β is the off-balance sheet operations coefficient, and α is the constant. In our model, Y stands for either: Net income, Total assets, Net interest margin, Loans, or equity.

4.2. Variables: The following table presents all variables that we use in the econometric analysis. The abbreviation of each variable and the sources we use to collect the data are also reported.

Table 01: The econometric analysis variables

Variable	Abbrev-iation	Definition	Data source
Net income	NI	Represents the bank's profitability minus all the expenses and costs.	The bank's financial statements
Total assets	TA	The total amount of assets owned by the bank.	The bank's financial statements
Net interest margin	NIM	It is measured as follows: nim = interest earned - interest expenses.	Calculated from the bank's financial statements
Loans	L	Represented by customer	The bank's

		loans.	financial statements
Off-balance sheet	OBS	Represented by off-balance sheet engagements including financing commitments, Guarantees, and other engagements.	The bank's financial statements
Equity	E	Including: social capital, reserves, general banking risks fund, ect.	The bank's financial statements

Source: Researchers

4.3. Diagnostic of the model: after estimating the model, a diagnostic test is required to ensure its accountability, for this reason, we applied a unit root test to all the variables used in the model to determine if the variables series are stationary or not. Therefore, a Dickey-Fuller test was used, we found that all the variables series are stationary at the first difference, hence, the OLS method is appropriate for our regression model.

Table 02: variables unit root test

variable	Level		First difference	
	Dickey-Fuller statistics	result	Dickey-Fuller statistics	result
TA	0.168939	non-stationary	-3.816929 **	stationary
NI	-0.415270	non-stationary	-7.8088695***	stationary
NIM	-0.243503	non-stationary	-4.753821***	stationary

L	0.045770	non-stationary	-4.707790***	stationary
OBS	-1.496553	non-stationary	-2.039940**	stationary
E	0.930352	non-stationary	-3.423245**	stationary

Source: researchers according to eviews10 outputs

***, **, *, correspond to 1%, 5%, and 10% level of significance respectively.

5. interpretation of the model

In this section, we will examine the impact of off-balance sheet activities (represented by off-balance sheet engagements) on the bank's performance including: Total assets, Net income, Net interest margin, Loans, provisions, and equity.

5.1. Total Assets

The model is as follows: $TA = \alpha + \beta*OBS + \varepsilon$

Where: (H_0: $\beta = 0$) and (H_1: $\beta \neq 0$)

Table 03: Total assets statistical model

Dependent Variable: Total Assets
Method: Least Squares
Sample: 2004 2019
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22597072	23265840	0.971255	0.3479
OBS	1.359221	0.156726	8.672571	0.0000
R-squared	0.843073	Mean dependent var		1.95E+08
Adjusted R-squared	0.831864	S.D. dependent var		1.17E+08
Prob(F-statistic)	0.000001			

Source: Eviews10 outputs

The outputs of the model indicate that there is a significant relationship between OBS and total assets since the probability of OBS is less than 1%, estimated by 0.00% than we must reject the null hypothesis that says there is no significant relationship between OBS and total assets. The outputs also indicate that the changes in the dependent variable (total assets) are in 84.30% caused by the changes in OBS and the rest 15.70% are caused by other variables.

TA = 22597072.1812 + 1.35922121116*OBS

This means that: there is a positive relationship between OBS and total assets, hence if OBS increases by 1 DZD, total assets will increase by 1.36 DZD.

- The *t statistic*

The results show that *t statistic* equal to 8.672571 is higher than the *t-table* equal to 2.120, thus, the null hypothesis is rejected, and the model is correct.

- Residuals diagnostic

To check the regression model reliability, and validity, a residuals diagnostic must be conducted with a normality test as follows:

H_0 = residuals are normally distributed / H_1 = residuals are not normally distributed

Table 04: residuals diagnostic

Series: Residuals

Sample: 2004 2019

Observations: 16

Jarque-Bera	3.118578
Probability	0.210286

Source: Eviews10 outputs

According to the results of the normality test, the residuals are normally distributed since the probability value (0.21) is higher than the levels of significance, which means that the null hypothesis is accepted,

therefore the model is correct.

5.2. Net income

The model is as follows: $NI = \alpha + \beta*OBS + \varepsilon$

Where: (H_0: $\beta = 0$) and (H_1: $\beta \neq 0$)

Table 05: Net income statistical model

Dependent Variable: NETINCOME
Method: Least Squares
Sample: 2004 2019
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	217588.8	503896.6	0.431812	0.6725
OBS	0.026461	0.003394	7.795597	0.0000
R-squared	0.812762	Mean dependent var		3583535.
Adjusted R-squared	0.799388	S.D. dependent var		2319933.
Prob(F-statistic)	0.000002			

Source: Eviews10 outputs

The results of the model indicate that there is a significant relationship between net income and OBS since the probability of OBS is less than 1%, estimated by 0.00% than we must reject the null hypothesis that says there is no significant relationship between OBS and net income. The outputs also indicate that the changes in the dependent variable (net income) are in 81.27% caused by the changes in OBS and the remaining 18.73% are caused by other variables.

NI = 217588.835545 + 0.0264614915693*OBS

This means that: there is a positive relationship between OBS and net income, hence if OBS increases by 1 DZD, net income will increase by 0.026 DZD.

- The *t statistic*

The results show that *t statistic* equal to 7.795597 is higher than the *t-table* equal to 2.120, thus, the null hypothesis is rejected, and the model is correct.

- Residuals diagnostic

To check the regression model reliability, and validity, a residuals

diagnostic must be conducted with a normality test as follows:

H_0 = residuals are normally distributed / H_1 = residuals are not normally distributed

Table 06: residuals diagnostic

Series: Residuals

Sample: 2004 2019

Observations: 16

Jarque-Bera	3.802691
Probability	0.149368

Source: Eviews10 outputs

According to the results of the normality test, the residuals are normally distributed since the probability value (0.14) is higher than the levels of significance, which means that the null hypothesis is accepted, therefore the model is correct.

5.3. Net interest margin

The model is as follows: $NIM = \alpha + \beta*OBS + \varepsilon$

Where: (H_0: $\beta = 0$) and (H_1: $\beta \neq 0$)

Table 07: Net interest margin statistical model

Dependent Variable: Net interest margin

Method: Least Squares

Sample: 2004 2019

Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-452539.9	1285129.	-0.352136	0.7300
OBS	0.076589	0.008657	8.846957	0.0000

R-squared	0.848269	Mean dependent var	9289662.
Adjusted R-squared	0.837431	S.D. dependent var	6572647.
Prob(F-statistic)	0.000000		

Source: Eviews10 outputs

The results of the model indicate that there is a significant relationship between net interest margin and OBS since the probability of OBS is less than 1%, estimated by 0.00% than we must reject the null hypothesis that says there is no significant relationship between OBS and net interest margin. The results also indicate that the changes in the dependent variable (the net interest margin) are 84.82% caused by the changes in OBS and the remaining 15.18% are caused by other variables.

NIM = -452539.939772 + 0.0765886240231*OBS

This means that: there is a positive relationship between OBS and net investment income, hence if OBS increases by 1 DZD, net interest margin will increase by 0.076 DZD.

- The *t statistic*

The results show that *t statistic* equal to 8.846957 is higher than the *t-table* equal to 2.120, thus, the null hypothesis is rejected, and the model is correct.

- Residuals diagnostic

To check the regression model reliability, and validity, a residuals diagnostic must be conducted with a normality test as follows:

H_0 = residuals are normally distributed / H_1 = residuals are not normally distributed

Table 08: residuals diagnostic

Series: Residuals

Sample: 20004 2019

Observations: 16

Jarque-Bera	3.284772
Probability	0.193518

Source: Eviews10 outputs

According to the results of the normality test, the residuals are normally distributed since the probability value (0.19) is higher than the levels of significance, which means that the null hypothesis is accepted,

therefore the model is correct.

5.4. Loans

The model is as follows: Loans = α + β*OBS + ε

Where: (H_0: β = 0) and (H_1: β ≠ 0)

Table 09: Loans statistical model

Dependent Variable: LOANS
Method: Least Squares
Sample: 2004 2019
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	8046436.	18798755	0.428030	0.6751
OBS	0.869715	0.126635	6.867906	0.0000
R-squared	0.771123	Mean dependent var		1.19E+08
Adjusted R-squared	0.754774	S.D. dependent var		78281312
Prob(F-statistic)	0.000008			

Source: Eviews10 outputs

The results of the model indicate that there is a significant relationship between loans and OBS since the probability of OBS is less than 1%, estimated by 0.00% than we must reject the null hypothesis that says there is no significant relationship between OBS and loans. The results also indicate that the changes in the dependent variable (loans) are 77.11% caused by the changes in OBS and the remaining 22.89% are caused by other variables.

L = 8046436.00169 + 0.869715000626*OBS

This means that: there is a positive relationship between OBS and loans, hence if OBS increases by 1 DZD, loans will increase by 0.86 DZD.

- The *t statistic*

The results show that *t statistic* equal to 6.867906 is higher than the *t-table* equal to 2.120, thus, the null hypothesis is rejected, and the model is correct.

- Residuals diagnostic

To check the regression model reliability, and validity, a residuals diagnostic must be conducted with a normality test as follows:

H_0 = residuals are normally distributed / H_1 = residuals are not

normally distributed

Table 10: residuals diagnostic

Series: Residuals

Sample: 2004 2019

Observations: 16

Jarque-Bera	1.045134
Probability	0.592996

Source: Eviews10 outputs

According to the results of the normality test, the residuals are normally distributed since the probability value (0.59) is higher than the levels of significance, which means that the null hypothesis is accepted, therefore the model is correct.

5.5. Equity

The model is as follows: Equity = $\alpha + \beta$*OBS + ε

Where: (H_0: $\beta = 0$) and (H_1: $\beta \neq 0$)

Table 11: Equity statistical model

Dependent Variable: EQUITY
Method: Least Squares
Sample: 2004 2019
Included observations: 16

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	160233.0	3363869.	0.047634	0.9627
OBS	0.179654	0.022660	7.928185	0.0000

R-squared	0.817841	Mean dependent var	23012500
Adjusted R-squared	0.804830	S.D. dependent var	15701629
Prob(F-statistic)	0.000002		

Source: Eviews10 outputs

The results of the model indicate that there is a significant relationship between equity and OBS since the probability of OBS is less than 1%,

estimated by 0.00% than we must reject the null hypothesis that says there is no significant relationship between OBS and equity. The results also indicate that the changes in the dependent variable (equity) are 81.78% caused by the changes in OBS and the remaining 18.22% are caused by other variables.

E = 160232.957354 + 0.179653802298*OBS

This means that: there is a positive relationship between OBS and equity, hence if OBS increases by 1 DZD, equity will increase by 0.179 DZD.

- The *t statistic*

The results show that *t statistic* equal to 7.928185 is higher than the *t-table* equal to 2.120, thus, the null hypothesis is rejected, and the model is correct.

- Residuals diagnostic

To check the regression model reliability, and validity, a residuals diagnostic must be conducted with a normality test as follows:

H_0 = residuals are normally distributed / H_1 = residuals are not normally distributed

Table 12: residuals diagnostic

Series: Residuals

Sample: 2004 2019

Observations: 16

Jarque-Bera	4.635428
Probability	0.098498

Source: Eviews10 outputs

According to the results of the normality test, the residuals are normally distributed since the probability value (0.098) is higher than the level of significance, which means that the null hypothesis is accepted, therefore the model is correct.

6. discussion of results

Total assets:

The study found a positive statistically significant relationship between off-balance sheet activities and total assets, which indicate that if OBS increase assets will increase. Off-balance sheet items (OBS) are assets and liabilities that do not appear on the on-balance sheet. The reason they are not included on the balance sheet is that there is no equity or debt linked to them. However, these items can transform to on-balance sheet and cause an increase in the total amount of assets, but at the same time this transition will increase the risks borne by the bank. We concluded that a positive relationship does not necessarily mean positive impact.

Net income:

OBS activities are considered a big source of leverage in the banking industry, generating profit as well as risks. Thus, the positive relationship between OBS activities and net income, that this study concluded to, is acceptable, and consists with the result of (Kashian & Tao, 2014) (Middi, 2016) (Swain & Panda, 2017). Generally, OBS activities do not need a lot of capital requirements, and due to its financial leverage, the impact on the profitability is very large and increases the profitability indicators of the bank. We suggest also that commissions from off-balance sheet activities are the reason for this positive relationship, and that commissions have more flexibility and are more profit generating than interest rate because the latter is specified by the law.

Net interest margin:

In most cases, there is a negative relationship between net interest margin and OBS. However, off-balance sheet activities tend to incentivize bank lending behavior with a view to cross-selling, but at the same time these practices compress net interest margins, as banks tend to use loans as a loss leader and reduce interest rates charged (Lepetit, Nys, Rous, & Tarazi, 2008) (Angori, Aristei, & Gallo, 2019). This study found that there is a significant positive relationship between NIM and OBS which consists with the findings of (Benahmed-Daho, Bouteldja, & bendob, 2015). The results may suggest that the using of off-balance sheet activities can increase lending, thus, increase net interest margin as a result.

Loans:

The results show that OBS and loans have a positive and significant relationship. These results consist and confirm the previous results about net

interest margin. The study concluded that off-balance sheet activities may increase the amount of loans given by the bank.

Equity:

The results showed a statistically significant positive relationship between OBS activities and equity. Off-balance sheet activities are a tool used to avoid regulations and prevent the bank from taking more capital requirements, so they tend to increase profitability by using debt or equity instruments.

7. CONCLUSION

Off-balance sheet operations have been a main topic in recent years due to their large and rapid growth, as well as the great importance of these operations, so it was necessary to study the impact of these operations on the activity of banks.

This study aimed to analyze the impact of off-balance sheet activities on some of the bank's performance indicators, namely: total assets, net income, net interest margin, loans, and, equity, the study was applied on one of the largest private commercial banks in Algeria in terms of the size during the period 2004 to 2019.

The study found a positive statistically significant relationship between off-balance sheet activities and total assets, which consist with the fact that off-balance sheet items are assets and liabilities that do not appear on the on-balance sheet. However, these items can transform to on-balance sheet and cause an increase in the total amount of assets.

OBS activities are considered a big source of leverage in the banking industry, generating profit as well as risks, and due to its financial leverage, the impact on the profitability is very large. Commissions from off-balance sheet activities are also considered one of the reasons for this positive relationship.

The results show that OBS activities have a positive and significant relationship with both net interest margin and loans. These results indicate that off-balance sheet activities may increase the amount of loans given by the bank, hence, increase net interest margin as a result.

The results showed a statistically significant positive relationship between OBS activities and equity, so, they tend to increase profitability by using debt or equity instruments.

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