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Analysis of the Financial Leverage Effect in the Context of Interest Rates Increase

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Abstract

The main objective of this paper is to demonstrate the importance of a tool, called in the specialized literature, financial leverage effect, in managerial decision-making process, regarding the way to finance the assets and finding an optimal indebtedness. The research context comes as a result of the recently increase in the inflation rate, at global, European and national level. This fact led the national central banks to revise their monetary policies, mainly through the monetary policy increases interest rate. As a consequence, the commercial banks (which borrow money from the Central or National Bank) grant more expensive loans to commercial companies. Theoretical research on the conceptual approach is complemented by the case study method, whose results show that an increase in the interest rate on loans contracted by the companies, can lead to a decrease in the financial leverage effect value, until reaching even negative values.

Keywords: *Return on Equity, Return on Assets, Interest Rate, Level of Indebtedness, Financial Leverage Effect*

JEL Classification : G32, M21, M40.

Introduction

In the context of Covid-19 pandemic and rising energy prices, inflation has increased globally. Thus, according to the Financial Newspaper quoting the American Bloomberg News Agency, in 2021, in the USA, the annual inflation rate reached 6,8%, and in January 2022 reached 7,5%, which is a record of the last 40 for years. According to Eurostat (European Union Statistical Office), European Union annual inflation was 5,3% in December 2021, up from 5,2% in November 2021. A year earlier, the rate was 0,3%.

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According to National Institute of Statistics, in Romania, the average annual inflation rate calculated based on the Consumer Prices Index (CPI), in December 2021, was 8,2%, compared to December 2020, while the average annual inflation rate calculated based on the Harmonised Index of Consumer Prices (HICP - inflation indicator for EU Member States) from the same period, was 6,7%. Unfortunately, the current scenario, which is based on available data and regulations, shows a considerable deterioration in the short and medium term perspective regarding the inflation, under the strong impact of energy prices. The estimates of the National Bank of Romania show inflation values from 8,0% at the end of the first quarter 2022, to 11,2% at the end of the second quarter 2022, to 10,2% at the end of the third quarter 2022 and up to 9,6% at the end of the fourth quarter of the same year. As a measure to reduce the inflation, most of the Central Banks (including the National Bank of Romania) have increased their monetary policy interest rate, also called the reference interest rate or key interest rate. Monetary policy interest rate is the interest rate at which the commercial banks borrow money from the Central or National Bank. As a result, the increase in this interest rate has led to an increase in the cost of loans granted by commercial banks. In this context, we consider appropriate to investigate how the indebtedness cost influences companies financial policy, by interpreting the financial leverage effect.

1. Inflation and monetary policy interest rate in Romania - evolution analysis

Analyzing the evolution of the inflation, the evolution of the monetary policy interest rate and implicitly the evolution of the interest rate at which the companies borrow money, helps to delimit and understand the context in which choosing this research topic proves to be opportune. Table 1 shows the inflation rate values registered in Romania between December 2020 and December 2021, and Table 2 shows the evolution of Romania's monetary policy interest rate.

Table 1.

The evolution of inflation in Romania
Period: December 2020 - December 2021

DATE	INFLATION RATE (%) calculated based on:	
	CPI	HICP
December 2021	8,2	6,7
November 2021	7,8	6,7
October 2021	7,9	6,5
September 2021	6,3	5,2
August 2021	5,3	4,0
July 2021	5,0	3,8
June 2021	3,9	3,5
May 2021	3,8	3,2
April 2021	3,2	2,7
March 2021	3,1	2,5
February 2021	3,2	2,5
January 2021	3,0	2,0
December 2020	2,1	1,8

(Source: National Institute of Statistics)

The data presented in Table 1, show an increase in the inflation rate evolution, between December 2020 and December 2021, whether we are talking about the inflation rate based on the Consumer Prices Index (CPI) or the inflation rate based on Harmonised Index of Consumer Prices (HICP). In November 2021, the inflation rate calculated on the Consumer Prices Index (CPI) decreased slightly (from 7,9% to 7,8%), under the impact of capping and offsetting the prices of electricity and natural gas for the population.

Table 2.

The evolution of the monetary policy interest rate in Romania
Period: March 2020 - February 2022

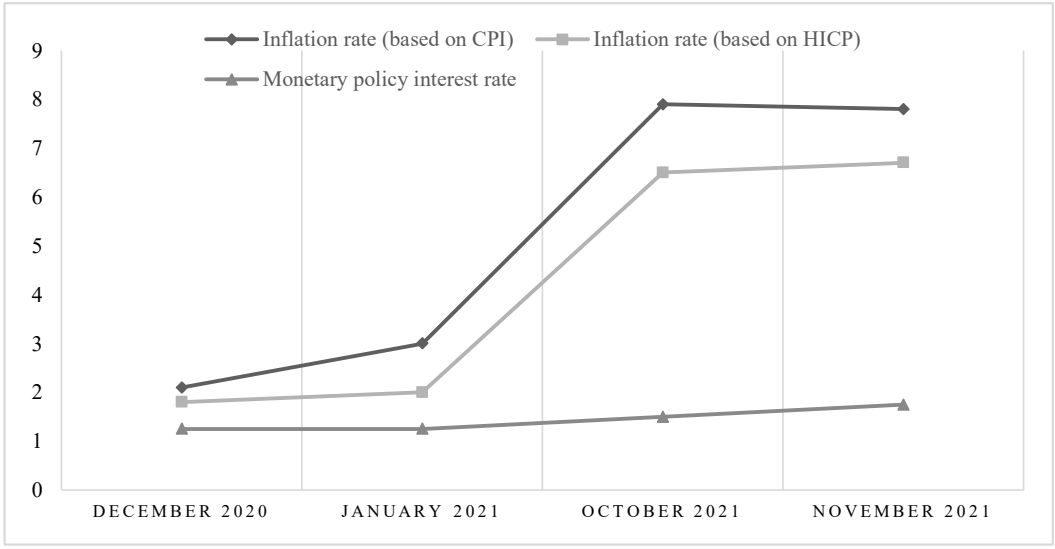
DATE	MONETARY POLICY INTEREST RATE
10.02.2022	2,50
09.02.2022	2,50
11.01.2022	2,00
10.11.2021	1,75
06.10.2021	1,50
18.01.2021	1,25
06.08.2020	1,50
02.06.2020	1,75
23.03.2020	2,00

(Source: National Bank of Romania)

Analyzing the data from Table 2, we notice that during the period of March 2020 - January 2021, the monetary policy interest rate decreased, but after January 18, 2021 the rate has increased continuously, until February 2022.

Graphic 1.

Graphic evolution of the inflation rate and the monetary policy interest rate



(Source: authors processing)

Comparing the values of the two indicators and corroborating with the role that a National or Central Bank can play in stopping inflation, it is easy to see and understand that the increasing evolution of the monetary policy interest rate is related to an increase in the inflation rate. The increasing evolution of the monetary policy interest rate is certainly leading to an increase in the interest rate on loans contracted by the population and by the companies.

In Graphic 1, we can see the upward trend of all the analyzed rates and also the inflation rate (calculated based on the CPI and the HICP) and the monetary policy interest rate. Even if we are tempted to consider that the increase in the monetary policy interest rate is insignificant compared to the increase in inflation, it is important to remember that this is the interest rate at which the commercial banks borrow money from the National Bank. Obviously, commercial banks, in turn, lend to companies using higher interest rates, which has led to an increase in all these rates.

2. Financial leverage and its components - conceptual approach and calculation method

The financial leverage effect represents the influence that the enterprise's level of indebtedness has on the return on equity. At the same time, financial leverage effect is a financial technique used by the company management, in order to improve the return on equity.

The principle of financial leverage effect (Teodorescu & Badea, 2007) is as follows: "when a company borrows money and invests in its activity, it obtains an additional economic result, normally higher than the financial expenses generated by that loan. The surplus equal to the difference between the additional operating result and the financial expenses, belongs to the shareholders, by increasing the return on equity".

The usual formulas recommended by the specialists (Petrescu, 2008) to calculate the financial leverage effect are:

$$\text{Financial leverage effect} = ROE - ROA \times (1 - t)$$

or

$$\text{Financial leverage effect} = (1 - t)(ROA - i) \times L$$

where:
ROE = Return on Equity
ROA = Return on Assets
i = Interest rate
t = Income tax rate
L = Financial Leverage

We can observe, from the formulas, that the financial leverage effect represents, on the one hand, the difference between Return on Equity and Return on Assets and, on the other hand, it reflects the variation of the Return of Equity according to the correlation between the Return on Assets and the interest rate, as well as the level of indebtedness and the income tax rate.

The analysis of the financial leverage effect is used in order to dimension the participation of each financing source engaged in the operating process, the purpose of this analysis being to fundament the decision in order to increase or decrease the entity level of

indebtedness. The financial leverage effect is related to the external capital, for which the cost of use is expressed by the interest paid (for example: bank loans, bonds or financing leasing). In other words, when a company uses indebtedness as a form of financing, it will incur financial costs corresponding to the costs of the resources attracted. The recognition in the financial statements of the financial expenses regarding the interests, entails a financial leverage effect, which reflects the positive or negative impact of the debt financing decision, on the return on equity and implicitly on the financial risk at the company level.

The interest rate paid by the company is an important component of financial leverage effect and a significant influencing factor, whose effect we will follow in this case study.

Obviously, in addition to the interest rate, there are other relevant components as factors of influence, such as: return on assets, income tax rate (established by government authorities in accordance with fiscal and macroeconomic policies), the financial structure of the entity, reflected by the ratio between the capital attracted through indebtedness from financial creditors and the equities (ratio known as financial leverage).

Financial leverage is the ratio of financial debt to equity, reflecting the ability of financial managers to attract external resources, to boost the equity's efficiency.

Therefore, the calculation for the financial leverage (L) is:

$$\text{Financial leverage} = \text{Financial Debts} / \text{Equity}$$

Normally, the value of this indicator should be subunit (< 1). A supra-unit value (>1) of financial leverage reflects a high level of indebtedness.

Return on Assets and Return on Equity are considered by specialists (Vâlceanu et al., 2004) two of the company's most important rates of return.

Return on Assets highlights the performance of a company's total assets or economic assets.

The usual formulas for calculating Return on Assets (ROA) are:

$$ROA = EBIT / TA \quad \text{or} \quad ROA = EBIT / EA$$

where:
EBIT = Earnings Before Interest and Taxes
TA = Total Assets
EA = Economic Assets = Equity + Financial Debts

For the corporate taxpayers, in order to ensure the terms consistency used in the financial analysis, it is necessary to determine the Return on Assets after income tax, as follows:

$$\text{ROA after income tax} = (1 - t) \times ROA$$

Return on Equities, usually determined by the ratio of net income to equity, is an indicator based on which the investors can appreciate the efficiency and implicitly the opportunity to maintain their investments (Niculescu, 2005). This indicator is also carefully calculated and monitored by business managers, having a major role in making financial policy decisions.

The ratios for calculating the Return on Equity (ROE) are:

$$ROE = \text{Net Income} / \text{Equity}$$

or

$$ROE = [ROA + (ROA - i) \times L] \times (1 - t)$$

It is important to note that the relationship between the Return on Equity and Return on Assets can be demonstrated by considering the following restrictions: financial income is neglected and financial expenses are limited to those with payable interests.

Following the conceptual delimitations and calculation formulas presented above, even if we are tempted to assume that a loan always has a negative effect on the company's financial, we find out that if the resources attracted are invested efficiently and the Return on Assets is higher than the interest rate, then indebtedness will have a positive effect on the company, an effect indicated by a high value of financial leverage effect.

However, as the interest rate on loans increases, analysis of the effect of this additional expenditure is very important.

3. Analysis of the financial leverage effect - case study

To analyze the effect of financial leverage effect, we will use a case study on the example of company Certes S.A., a Romanian legal entity, that pays income tax. The main economic and financial indicators are presented in Table 3.

Table 3.

Economic and financial indicators - Certes S.A.

INDICATORS	UNIT	VALUE
1. Economic assets	LEI	142.671.600
2. Equity	LEI	57.068.640
3. Financial debts	LEI	85.602.960
4. Total revenue, from which: 4.1. Operating revenue	LEI LEI	34.687.332 34.687.332
5. Total expenses, from which: 5.1. Operating expenses 5.2. Interest expenses (3 x 4%) 5.3. Income tax (4.1 – 5.1 – 5.2) x 16%	LEI LEI LEI LEI	29.006.719 24.500.580 3.424.118 1.082.021
6. EBIT (4.1 – 5.1)	LEI	10.186.752
7. Gross income (6 – 5.2)	LEI	6.762.634
8. Net income (4 – 5) or (7 – 5.3)	LEI	5.680.613
9. Interest rate	%	4
10. Income tax rate	%	16

(Source: Extract from the company's financial and economic statements)

We aim to highlight only the influence having by the interest rate on the financial leverage effect, so we will keep the financing structure constant (meaning the financial leverage given by the ratio between financial debts and equity). We will also use the economic asset (equal to the sum of the company's financial debts and equities) in the calculation of Return on Assets (ROA). We will neglect the financial income, and we will limit the financial expenses only to interest expenses. We will consider the Gross Profit for the year to be equal to the Taxable Income. In accordance with the actual tax regulations (Law 227/2015 regarding the Fiscal Code, with subsequent amendments and completions), the applied income tax rate is 16%. Based on the available indicators, the financial leverage effect is calculated and presented in Table 4. Starting from the initial situation, we propose three scenarios using different interest rate of the loans contracted by the company.

Table 4.

Financial leverage effect - Certes S.A.

INDICATORS	UNIT	INITIAL SITUATION	SCENARIO 1	SCENARIO 2	SCENARIO 3
1. Financial leverage		1,5	1,5	1,5	1,5
2. ROA	%	7,14	7,14	7,14	7,14
3. ROA after income tax 2 x (1-t)	%	6	6	6	6
4. Financial debts	LEI	85.602.960	85.602.960	85.602.960	85.602.960
5. Interest rate	%	4	5	7,14	8
6. Interest rate after income tax i x (1-t)	%	3,36	4,2	6	6,72
7. Interest expenses (4 x 5)	LEI	3.424.118	4.280.148	6.112.051	6.848.237
8. EBIT	LEI	10.186.752	10.186.752	10.186.752	10.186.752
9. Gross Income (8 - 7)	LEI	6.762.634	5.906.604	4.074.701	3.338.515
10. Income tax (9 x 16%)	LEI	1.082.021	945.057	651.952	534.162
11. Net Income (9 - 10)	LEI	5.680.613	4.961.547	3.422.749	2.804.353
12. ROE	%	9,95	8,69	6	4,91
13. Financial leverage effect [ROE - ROA (1-t)] or [(1-t) (ROA - i) x L]		3,95	2,69	0	-1,09

(Source: authors processing)

According to the results presented above, we can observe the following aspects:

• In the initial situation, the financial leverage effect has a positive value, equal to 3,95, which reflects a favorable influence of indebtedness on Return on Equity, due to the fact that the Return on Assets is higher than the interest rate.

• In Scenario 1, the financial leverage effect remains positive, but lower than in the initial situation. Increasing the interest rate from 4% up to 5% has therefore led to a decrease in financial leverage effect from 3,95 to 2,69.

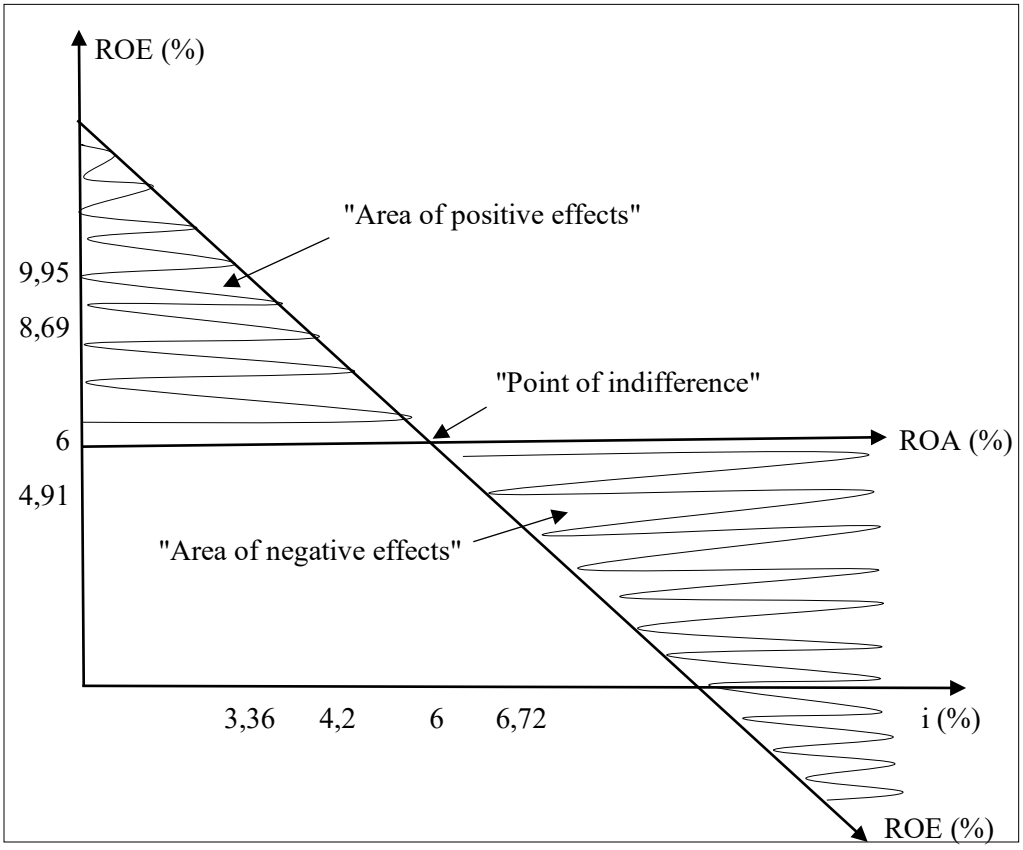
• In Scenario 2, the financial leverage effect is zero, which means that borrowing does not affect the company's financial profitability. This result is obtained when the interest rate becomes equal to Return on Assets. This moment is considered the "Point of indifference".

• In Scenario 3, the interest rate continues to rise, exceeding the value of Return on Assets, so the financial leverage effect is negative (-1,09). The negative value of the financial leverage effect indicates that indebtedness has an unfavorable effect, known in the literature (Petrescu, 2008) under the name of “mace effect”, for the company’s financial profitability.

Starting from the results obtained in the case study, in figure 1 we can see the “area of financial leverage effect”, depending on the interest rate.

Figure 1.

Areas of financial leverage effect



(Source: authors processing)

It is easy to observe that for equal values of interest rate (= 6%, after income tax), of Return on Assets and implicitly of Return on Equity, the financial leverage effect reaches the indebtedness's "Point of indifference". At this point, the financial leverage effect has zero value. For lower interest rate than the one corresponding to the "Point of indifference" (< 6%) the company is in the "Area of positive effects" of indebtedness (financial leverage has a positive value), while for higher interest rate (> 6%) the company is in the "Area of negative effects" of indebtedness (financial leverage has a negative value).

The chart (shown in Figure 1) can be a useful and easy-to-use tool for managers to analyze and guide the right funding policy. Where appropriate and possible, the most direct way for a company to reduce its debt effect is to pay off immediately, any outstanding debts and liabilities from its balance sheet. If we are talking about the decision to take out new loans, the managers should decide whether the expenses can be borne by the company and whether these new loans bring financial benefits. For forecast calculations or for creating a budget, it is recommended to use the estimated average interest rate for the next period. In addition to this aspect, financial management involves the analysis of all aspects that can ensure the sustainability of the company.

Conclusion

In the context presented in this article, the analysis of the financial leverage effect at the enterprises level, becomes a necessity to ensure a favorable Return on Equity. The practical approach presented in the paper and the chart that reflects the "areas of financial leverage effect" can be useful and easy-to-use tools for managers.

The research hypothesis that financial leverage effect decreases or even becomes negative if the interest rate on loans increases and reaches a higher value than the Return on Assets, indebtedness having in this case a "mace effect", has been empirically demonstrated, using the case study method. Thus, companies that take out loans under these conditions, instead of profiting from that debt, will incur financial losses, which requires priority to rethink the financing policy.

The interest rate paid by the company is an important component of financial leverage effect and a significant influencing factor, but obviously, in addition to the interest rate, there are other relevant components as factors of influence, such as Return on Assets and the financial leverage, reflected by the ratio between financial debt and equity. Further research is therefore needed to analyze the influence of these factors on financial leverage effect. Then, the correlation between these indicators is interesting to watch.

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