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RESEARCH ARTICLE

Relationship between Indebtedness and Profitability in Industrial Manufacturing Companies in Ecuador

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Abstract:

Manufacturing companies oversee converting raw materials into finished products, characterized by the intervention of machinery and labor force. The article analyzes, through correlation of variables, the relationship between indebtedness and profitability of a group of companies in the Ecuadorian manufacturing sector. The results showed an average debt ratio of 332.70%, which indicates that most of the companies work with money from suppliers or with credits offered by financial institutions. The return on investment shows an average of 113.57%, which indicates that the companies have excellent earnings in terms of what they invest in their economic activity. Correlational analysis showed little or no relationship between return on equity and debt ratio at 21.9%. Likewise, a weak negative relationship between profit margin and indebtedness was evidenced with a -42.4% correlation. In conclusion, the research data indicate that the manufacturing companies have not improved their profitable level by making adequate use of debt.

Keywords: Correlation, Financial analysis, Income, Indebtedness, Profitability.

Introduction

Manufacturing industries are responsible for transforming raw materials into finished products. Globally, Chaverra [1] assures that the countries of the European Union, China, and the United States, are the main nations that contribute to manufacturing production in the world. For 2018, in North America, the manufacturing sector increased by 3.1%, compared to 2017 where the increase was 1.8%.

In Ecuador, the manufacturing industry ranks second in sales generation for the country's economy, contributing 22.9% to the value of sales in the 2013 period [2]. In Ecuador, this sector, for the year 2019, was divided into four groups:

1. Manufacturing industries considered as large, which contributed 64.05% of annual income,

2. The medium-sized company had a purchase income of 22.66%,

3. With a 12.44% of sales revenue of small and medium-sized manufacturing companies,

4. Micro enterprises contributed 0.85% of their revenues [3].

This study consists of analyzing the relations hip between the financial indicators of indebtedness and profitability. Flores [4] points out that financial leverage helps industries to increase their return in equity. In other words, it makes it possible to finance assets without the need to take money from the company [5]. Indebtedness affects the viability and future growth of companies [6].

On the other hand, profitability varies constantly with capital and time. It verifies the relationship between the income generated and the resources or means used to obtain the results [7]. This ratio causes the known or predicted result in the company after interest expenses, thus measuring the benefit of the entity's own money [8].

For Majumdar [9], the determinants of corporate indebtedness are not only the firm's profitability, asset tangibility and cash flow volatility, but also the support given to the hierarchical level, and asymmetric informational theories of capital structure. For Grau & Reig [10] indebtedness, size, innovation specificity and reputation affect profitability to a greater or lesser extent, depending on the firm's level of operating leverage.

Similar studies carried out in Ecuador, to industrial companies, showed that this sector leverages to a great extent from its suppliers, avoiding the costs of a financial debt, and the destination of these resources is used to a great extent for the acquisition of fixed assets [11]. Sakr & Bedeir [12] concluded for publicly traded companies that capital structure is related to ROE as long as they do not use short-term total debt to total assets. On the other hand, Rodríguez and Campuzano [13] state that the capital structure of companies with high profitability is concentrated in debt and, to a lesser extent, in the equity structure. Mursalim y Kusuman [14] conclude, from another point of view, that indebtedness (capital structure) depends, among other variables, on profitability.

The present research evaluates the effectiveness and performance of financial indicators of debt and profitability of companies in the manufacturing sector taken from the 2019 directory of the Superintendence of Companies, Stocks, and Insurance of Ecuador.

Methodology

For the descriptive analysis and correlation of variables, a sample of manufacturing companies in the province of Azuay in Ecuador was taken. This sector is the second most developed in this region of Ecuador, with sales of more than 1,600 million dollars, in 2014, made up of companies of different sizes: large, medium, small and micro-enterprises [15].

A population of 392 companies was sampled with a confidence level of 95%, with a maximum accepted estimation error of 5%. After eliminating outliers, a sample of 58 manufacturing companies was obtained; it is worth mentioning that

these companies were selected through the random method. The companies were classified into activities of: Electronic Equipment, Clothing, Furniture Production, Food and Beverage Products, Rubber and Plastic Products, Metal Products, Nonmetallic Mineral Products, Textile Products, and Machinery and Equipment Repair and Installation, for further detailed analysis.

The debt and profitability indicators detailed in Table 1 were used for the analysis.

Table 1. Indebtedness and profitability

Indebtedness Ratios	Formula
Long – term Debt	Long-Term Liabilities / Total Liabilities
Debt Ratio	Total Liabilities / Total Assets
Indebtedness	Total Liabilities / Stockholders' Equity
Profitability Ratios	Formula
Profit Margin	Net Income / Sales
Return on Equity	Net Income / Total Stockholders' Equity
Return on Assets	Net Income / Total Assets
Return on investment	(Sales - Costs) /Costs
Earnings Before Interest and Taxes	Sales - Cost of Sales = Gross Profit - Sales and Administrative Expenses = Operating Profit

Source: Own elaboration, information taken from Superintendencia de Compañías Valores y Seguros [3].

After the application of these indicators, their correlation with each other was evaluated. According to Riquelme [16] the correlation coefficient corresponds to the statistical relationship between two random quantitative variables. The correlation level is related between -1 and +1, with a value of 0 indicating that there is no relationship between the variables, for which Table 2 will indicate the type of correlation and its variants.

Table 2. Type of correlation and its variants

Type of Correlation	Description
Positive	In other words, the variables are directly related, since they increase both variables at the same time.
Negative	The variables are inversely related, i.e. as one variable increases, the other decreases.
Null	When the relationship is 0 it means that it has no relationship with each other, it cannot establish any sense of conversion.
Scale	Range
0 - 0,25	Little or none
0,26 - 0,50	Weak
0,51 - 0,75	Moderate to strong
0,76 - 1,00	Strong to perfect

Source: Own elaboration, information taken from Cabrera [17].

Results

The results obtained from the analysis of the manufacturing sector are presented under two headings:

1. Descriptive analysis of the manufacturing companies,
2. Profitability and Debt Ratios,
3. Correlation of variables: Indebtedness and Profitability.

Descriptive analysis of the manufacturing companies

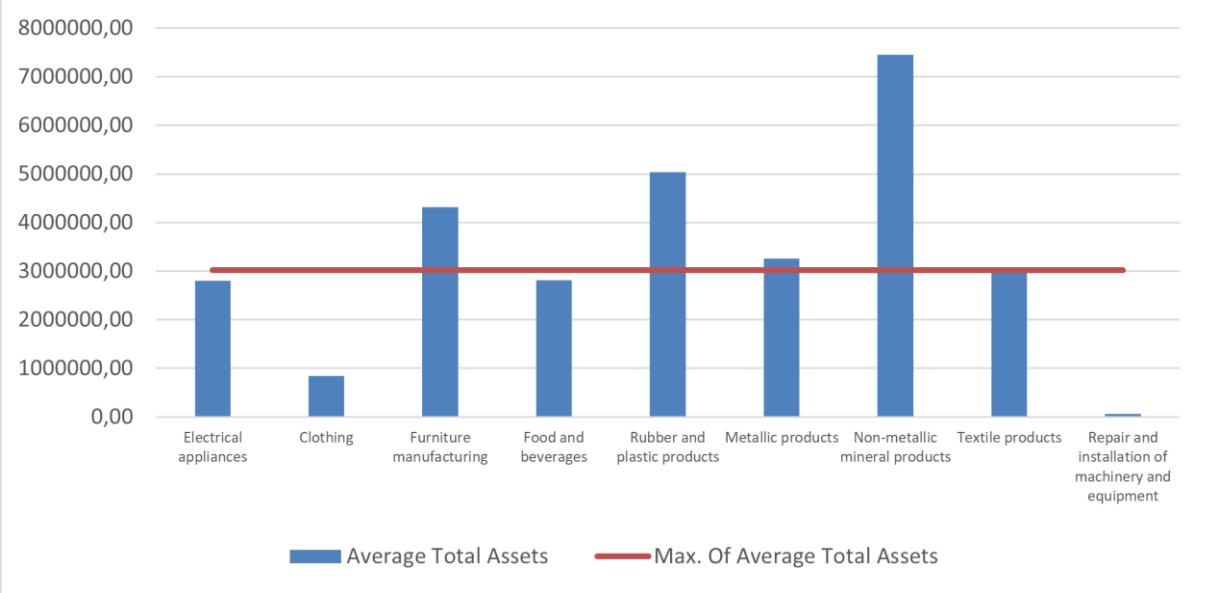

Figure. 1 Level of assets by economic activity
Source: Own elaboration based on data from Financial Statements 2019.

Figure 1 depicts the average of the Assets and shows that the overall average of the 9 activities in the manufacturing sector is $ 3,020,896,83. A 44.44% of the activities have assets above the average level. The economic activities that exceed an average level of assets are Furniture Manufacturing, Rubber and Plastic Products, Metallic Products, and Non-metallic Mineral Products. In addition, the Textile Products industry is on the average line; it indicates that it remains within the established range. The activities found to be below the average level are Food and Beverages, Electronic Appliances, Clothing, and Repair and Installation of Machinery and Equipment.

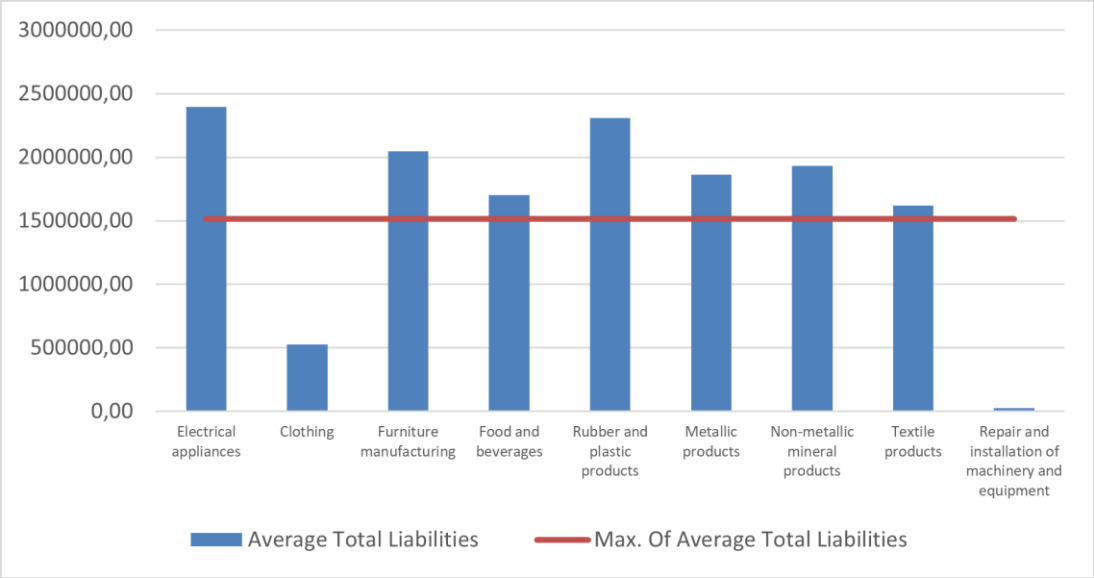

Figure 2 Level of liabilities by economic activity
Source: Own elaboration based on data from Financial Statements 2019.

Liabilities are the debts and obligations of a company. Within the results presented in Figure 2, the overall average liabilities of the 9 sectors are $1,512,394.97. A 66.67% of the activities present an above average level of liabilities, where the activities of Electrical Appliances, Furniture Manufacturing, Rubber and Plastic Products and Non-Metallic Mineral Products stand out. The activities that are below the average level of liabilities are: Clothing and Repair and Installation of Machinery and Equipment. In some cases, companies work with suppliers' capital, which is a good thing if they are managed correctly, thus facilitating the necessary financial resources.

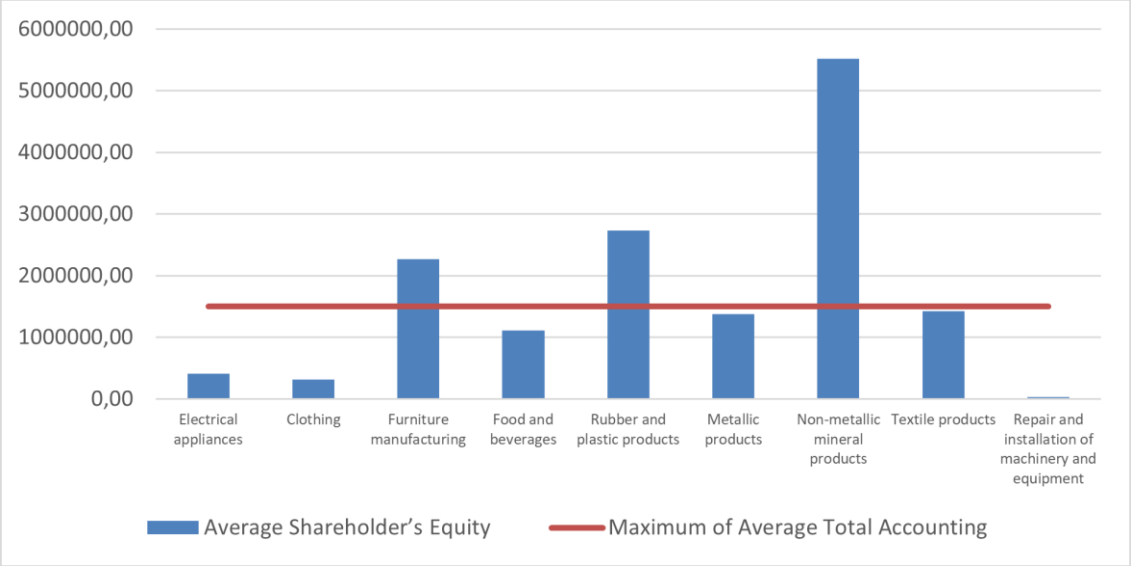

Figure 3 Capital by economic activity
Source: Own elaboration based on data from Financial Statements 2019.

Capital corresponds to the physical or financial resources that a company possesses. Within the results, Figure 3 shows that the general average of the 9

activities is 1,504,940.12. It is worth mentioning that the companies dedicated to Furniture Manufacturing, Rubber and Plastic Products, and Non-Metallic Mineral Products are the ones that exceed the average value of capital. Finally, activities such as Electrical Appliances, Clothing, Food and Beverage Products and Metallic Products are below the average level.

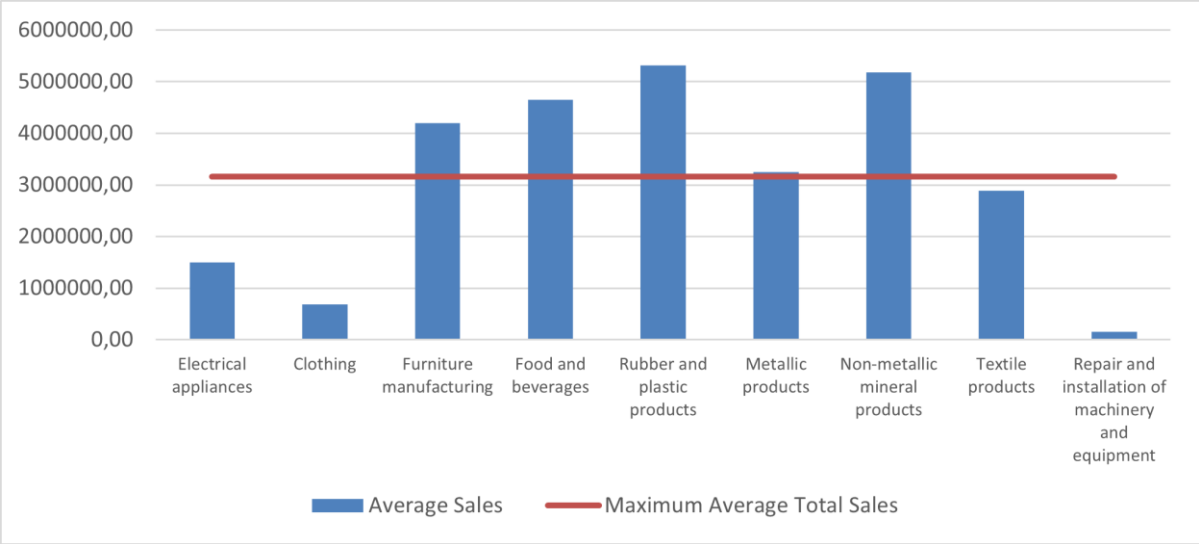

Figure. 4 Level of sales by economic activity
Source: Own elaboration based on data from Financial Statements 2019.

Figure 4 shows how the level of sales behaves, resulting in an overall average of $ 3,160,577.34. The 44.44% of the activities show sales above the general average. The Metallic Products activity is located on the average sales line, while the sectors that are below average did not obtain an income for their manufacturing activity which are: Electrical Appliances, Clothing, Textile Products, and Repair and Installation of Machinery and Equipment.

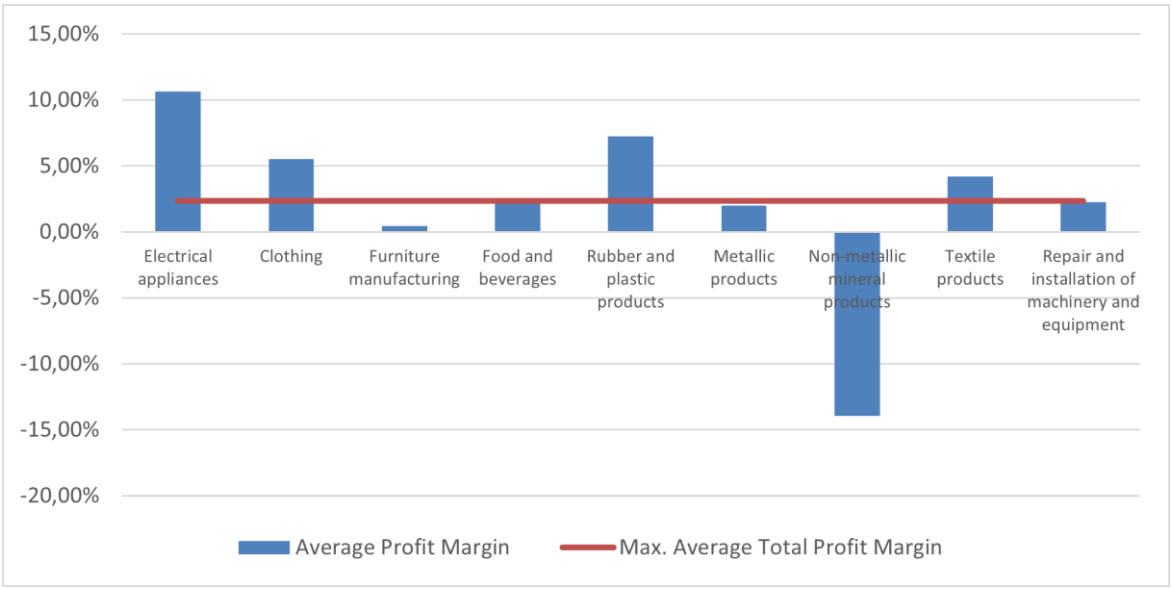

Figure 5 Profit margin level by economic activity
Source: Done by authors based on 2019 Financial Statements.

The profit margin represents the company's return on sales after covering its costs. Figure 5 shows an average net profit of 2.35%, with 4 activities in the industry exceeding the average. In addition, there are activities that are in the trend line, among them: Food Products, Beverages and Repair and Installation of Machinery and Equipment. It should be stated that the Non-Metallic Mineral Products industry shows a negative profit margin.

Profitability and debt ratios

Table 3. Profitability and debt

Indebtedness Ratios	Average
Long-Term Debt	33,13%
Debt Ratio	57,55%
Indebtedness	332,70%
Profitability Ratios	Average
Profit Margin	2,35%
Return on Equity	9,60%
Return on Assets	3,47%
Return on Investment	113,57%
Profit before interest and taxes	$ 182.766,25

Source: Own elaboration based on data from Financial Statements.

Long-term debt implies for a company to carry out activities through debt capital. In Table 3, this indicator shows a 33.13% value, which allows us to know that manufacturing companies are managed with money from financial creditors leveraging their investment to have results in the future.

The debt ratio indicator shows the management of other people's and institutions' money used by the companies to generate profits. The analysis of manufacturing companies showed a debt ratio of 57.55%. This shows that the companies are managed with money from financial institutions, this means their assets have been financed.

The indebtedness indicator shows a percentage of 332.70%. This shows the amount of debt used to finance the assets in relation to the capital of the entities. However, indebtedness that is not sustainable could generate a short-term closure. For leverage to be at an optimal level, it should be between 40% and 60%; therefore, if it is lower than 40%, it would not be using resources efficiently and if it is higher than 60%, it means that the company is depending on external resources [18]. The information given above is stated by the theory in a general way; however, this composition depends on the industry, its ability to pay and stability in the market, asset structure, size and profitability of companies, the existence of non-debt tax protection and growth opportunities [19]. Therefore, 332.70% is considered as a high level of indebtedness for the analysed manufacturing firms.

About profitability ratios, it is observed that the profit margin is 2.35%. This ratio allows measuring the capacity to generate profits of a company. The return on equity is a ratio that shows the manager's efficiency to generate profits; in the case of the companies studied, a 9.60% of them are being efficient at managing capital.

Return on assets measures the efficiency of the company in generating profits in relation to its assets. The manufacturing companies studied have a 3.47% return on assets. Likewise, the return on investment allows us to know how much the

company earned for the investment made. The manufacturing companies studied, with 113.47%, show that the return on investment was 113.47 times the initial investment.

Correlation of variables: Indebtedness and profitability

Table 4. Correlation of indebtedness and profitability rations

	Long-Term Debt (Long-Term Liabilities/ Total Liabilities)	Debt Ratio (Total Assets/ Total Liabilities)	Indebtedness (Total Liabilities/Capital)
Profit Margin (Net Profit/ Sales)	-38,1%	-39,7%	-42,4%
Return on Equity (Net Income/ Stockholder's Equity)	-31,9%	21,9%	13,8%
Return on Assets (Net Income / Total Assets)	-45,9%	-2,6%	-12,0%
Return on Investment((Sales - Costs)/Costs))	-27,6%	-13,0%	-14,6%
Profit Before Interest and Tax (Sales – Sales Cost = Gross Profit - Sales and Administration Expenses = Operating Profit)	-13,2%	7,0%	-1,0%

Source: Own elaboration based on data Financial Statements 2019.

Table 4 shows the correlation of variables of the debt and profitability ratios. According to the results presented, it is observed that no correlation is 0.76 - 1.00, which represents a strong to perfect relationship. The highest correlation is presented between return on equity and debt ratio with 21.9%, which corresponds to a correlation between 0 and 25 which shows little or no relationship. It is also important to highlight that the negative correlation between the profitability ratios (except for the return on equity) and indebtedness behave adequately, since the generation of higher interest would lower the profits.

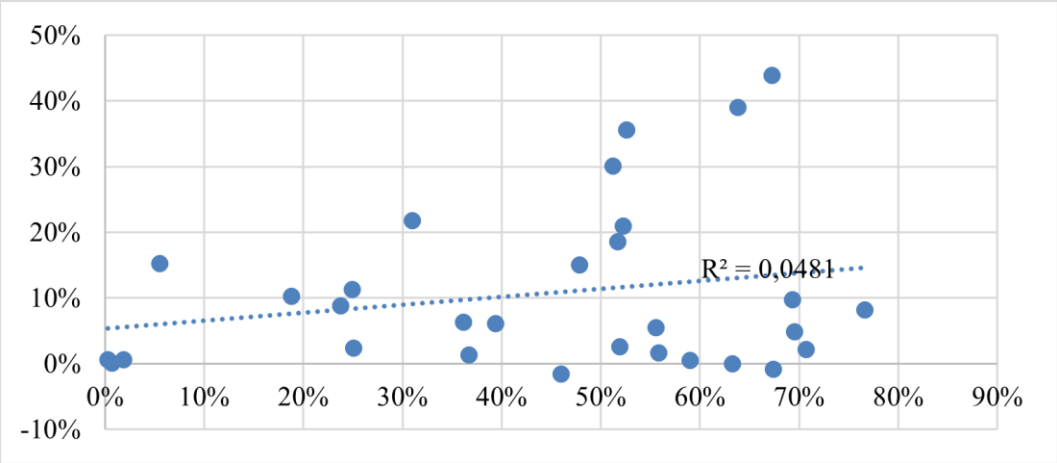

Figure 6 Correlation between return on equity and debt ratio.
Source: Own elaboration based on Financial Statements 2019.

The return on equity represents the financial return on own resources, while the level of indebtedness measures the ratio of debt in relation to own resources. Figure 6 shows little or no correlation between these variables, the trend line is positive, but is dispersed at different points, which means that the more indebted the company is, the more resources it must operate during the year. Some companies are mostly managed with capital from suppliers and other financial institutions than with their own capital.

The correlation between profit margin and indebtedness shows a negative value of -42.4%, which indicates that indebtedness has an inverse relationship with the profit margin of the companies studied.

Conclusion

In the research carried out, it was observed that small, medium, or large enterprises are subject to financial imbalance because of poor management of their finances, which can be verified in the values of their financial ratios such as indebtedness and profitability. This is usually because companies do not always have financial, administrative, production or marketing policies.

In the correlation of variables, profitability does not show a dependence on the return on equity and the debt ratio, with 21.9% which shows little or no correlation. This phenomenon may occur because for sure there were no efficient financial studies in the sense of evaluating the option of what is convenient, whether to finance the investment projects with debt or to do it through another source (analysis of the pertinence of financing sources).

In addition, there is little or no correlation between Return on Equity and the Debt Ratio. On the other hand, the correlation between The Profit Margin and Debt is zero and its trend is negative. Finally, it is observed that the profit margin and indebtedness have a negative percentage of -42.4%, which shows that the cost of debt influences the decrease of the profit, and this is the reason for the negative relationship. This finding shows that for manufacturing companies, indebtedness has not brought positive results, but the opposite for their financial results.

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