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Determinants of Capital Structure for Listed Companies in the Colombian Industrial Sector

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Abstract

The purpose of this study was to determine the relationship between tangibility, corporate taxes, age, and company size to the capital structure of Colombian firms. Thirty five (35) companies of the industrial sector listed by the Colombian Stock Exchange were chosen as the sample for this study. Financial data used in the analysis was collected from their public annual reports. A Pearson correlation coefficient was used to analyze the linear dependence between leverage (firm's capital structure) and the independent variables (tangibility, corporate tax rate, age, and company size). The results indicate that tangibility, corporate tax rate, and age of companies don't have a significant relationship with the leverage of the company. But, there exists a significant positive correlation between the size of the company and its capital structure which is consistent with the trade-off theory of capital structure.

Keywords: *Capital structure, tangibility, corporate tax rate, company size, age*

Introduction

Background of the study

Capital structure is one of the most important and complicated areas of corporate strategy and financial decision making. It indicates the combination of debt, equity, and other sources of funds a company uses to finance its operations.

Modigliani and Miller (1958), as the pioneers of the study of the determinants of corporate capital structure, provided the foundation for an understanding of the differences between unlevered and levered firm values, which increased the interest on the study of capital structure analysis and the key factors influencing financing decisions.

Zamudio (2005) observed that the capital structure of private companies in Colombia depended to a large extent on debt financing, and only few companies from the industrial sector used bonds and stocks as a source of financing. Tenjo, López, and Zamudio (2006) indicated that financing decisions of Colombian companies were significantly related to higher information asymmetries.

According to Mazur (2007), studies have recently shifted their focus to the pecking order theory, indicating disagreement on the factors influencing the firms' capital structure.

Wadnipar and Cruz (2008) found that the pecking order theory was described as a factor concerned with short-term financing decisions of Colombian managers. He further noted that, for small and medium size companies, financial obligations and account payables were the most important determinants of capital structure.

Few empirical studies have been carried out in Colombia to provide sound evidence of the determinants of capital structure, although Colombia is characterized by its industrial sector that plays a great role on the growth of the economy of the Country as it adds and counted second to the increase of Colombian Gross Domestic Product (Medina, Salinas & Ochoa, 2012).

The aim of this study was to provide a more focused perspective on what are the factors that relate to the capital structure decisions of listed companies of the industrial sector of Colombia.

Research Problem

The problem of capital structure has attracted intense dialogue within the field of corporate finance. The fundamental question is whether there exists an optimal level of leverage, and what might be its determinants.

Whereas there are several studies done in developed countries, the developing countries are trying to increase the research on this subject. To date, limited research has been done in Colombia.

This study was intended to investigate the situation in Colombia. The findings may provide a better foundation for financial decisions making in the industrial sector of Colombia. The study was based on the following questions: What factors have been identified by scholars as determinants of capital structure? Is there any significant relationship between those factors and the capital structure of listed Colombian industrial companies?

Literature Review

Theories on Capital Structure

Capital Structure is described as the mix of debt (issuing bonds) and equity (issuing stocks), or hybrid securities a firm uses to finance its capital expenditures and day to day operations. In simple terms, it is defined as the leverage ratio (Saxena, 2014).

Capital structure and its effect on the company's value was initially introduced by Modigliani and Miller (1958) when they stated that under conditions of perfect capital markets, the financial leverage of the company was irrelevant to its value. Later on, in 1963, Modigliani and Miller took taxation under consideration. Their theory suggested that the higher debt use is, the higher the firm's value is. This is because interest on debt is a tax-deductible expense.

Many theories of capital structure evolved from Modigliani and Miller's model, and they can be classified into two groups: The first group are those which recognize the existence of an optimal level of debt, such as trade-off theory (Kraus & Litzenberger, 1973), the agency theory (Jensen & Meckling, 1976), and the free cash flow theory (Jensen, 1986). The second group does not recognize any optimal level of debt and includes the pecking order theory (Myers & Majluf, 1984) and the equity market timing theory developed by Baker and Wurgler (2002).

The Trade-off theory explained by Kraus and Litzenberger (1973) identified a tax advantage to debt financing as Modigliani and Miller did in 1963. Since interest expenses are tax deductible, financial leverage decreases the company's corporate income tax liability and increases its after-tax profit. However, they also acknowledged that there is a financial risk of adding debt. If the company cannot meet its debt obligations, it is forced into bankruptcy and it will have to bear all the costs of financial distress. Thus, this theory suggests that companies should choose their optimal capital structures by trading off the benefits and costs of debt and equity.

On the other hand, a group of researchers suggested considering the problem of agency cost as an important element in determining capital structure of firms. Jensen and Meckling (1976) recognized that a conflict between managers and shareholders results in agency cost of equity, and the conflict between shareholders and debt-holders results in agency cost of debt. Moreover, Jensen (1986) developed a theory that explains the benefits of debt in reducing agency costs of free cash flows. This theory is applied to companies with extra-high free cash flow. It states that companies should give back extra cash flows to investors to prevent managers from investing the excess of cash flows in projects with returns below the cost of capital or in any capital expenditure that will not maximize shareholders wealth.

Contrary to the trade-off theory, there is the pecking order theory developed by Myers and Majluf (1984), which indicates that there is no target level of leverage since companies have a specific preference order for capital used to finance their businesses. This theory suggests that managers prefer internal over external funds and if there is a need for external financing, managers issue debt

first and issue equity only as a last resort. Some of the reasons discovered by Myers and Majluf (1984) as to why managers behave in this way are: First, managers found that it is generally better to issue low risk debt than high risk equity. Second, firms whose investment opportunities outpace operating cash flows, and which no longer have the opportunity to issue save securities, may sacrifice profitable investments rather than choosing equity to finance them. Lastly, issuing stock to finance investment may lead to a fall in stock prices, but if companies issue debt the stock price may not fall.

Finally, a new theory about capital structure was developed by Baker and Wurgler (2002). They found that there is a strong relationship between capital structure and market values, and that capital structure is the accumulation of market timing financing decisions.

Determinants of Capital Structure

Having reviewed the theories of capital structure, let's now review the variables selected for this study in the lights of local and foreign studies.

Zhang (2010), Alkhatib (2012), Cortez et al. (2012), Masnoon and Anwar (2012), Medina et al. (2012), and Umer (2014) showed that tangibility has a significant impact on the capital structure of the firms.

Mazur (2007) did not find a significant relationship between the corporate tax rate and the capital structure. However, later on Nur (2014) showed that corporate tax rate has a significant impact on the capital structure of the firms.

Hall, Hutchison, and Michaelas (2000) showed that age has a significant impact on the capital structure of the firms. Although, Zhang (2010) and Nur (2014) did not find a significant relationship between age and the capital structure.

Saylgan, Karabacak and Küçükkocaoglu (2006), Zhang (2010), and Umer (2014) showed that size has a significant impact on the capital structure of the firms. Although Cortez and Susanto (2012) showed that size does not have an impact on the capital structure of the firms.

The literature review has produced a list of factors considered by scholars as determinants of capital structure. The reasons why tangibility, corporate tax rate, age and size of the company are considered for this study are explained below.

Tangibility

Alkhatib (2012) defines tangibility as the fixed assets to total assets ratio. The assets structure of a company is important in determining the capital structure, because tangible assets can serve as collateral for loans (Umer, 2014). According to the trade-off theory, there should be a positive relationship between fixed assets and debt.

Zhang (2010), who studied the determinants of leverage in the manufacturing industry of England, identified tangibility as a determinant of capital structure. Alkhatib (2012) did the same for listed companies on the Jordanian Stock Exchange and his results showed that tangibility had a significant relationship with leverage. Masnoon et al. (2012) also found that tangibility has a positive relation with leverage, during a study done on the determinants of the capital structure of Karachi Stock Exchange listed pharmaceutical companies of Pakistan. This is broadly consistent with the findings of Umer (2014) who analyzed the determinants of the capital structure of companies in Ethiopia.

Another study done on Japanese manufacturing companies listed in Tokyo Stock Exchange showed that assets structure had a significant relation with the leverage level of the companies (Cortez & Susanto, 2012).

For the Colombian manufacturing sector, Medina et al. (2012) found a strong positive relation between tangibility and leverage of small companies. However, the same study found that tangibility had a negative relation with leverage when analyzing big companies in the same sector. This is

attributed to the fact that big companies prefer to use internal funds first, which is consistent with the picking order theory of capital structure that predicts that firms holding more tangible assets will be less likely to issue debt (Myers & Majluf, 1984).

Corporate Tax Rate

Companies cannot avoid the corporate tax which together with the financing decisions of a listed company play a fundamental role in the company's total market value (Ping & Caixia, 2011). Modigliani and Miller (1958) came to the conclusion that the bigger the amount of debt financing, the bigger the company's total market value. They proposed that together with corporate taxes, the total market value of a firm with leverage is equal to the value of an unlevered firm plus the present value of the tax shield. Therefore, if the government increases the corporate tax rate, the tax benefit from the debt will become bigger than before, and the company will prefer to use debt financing because the firm's total value will increase.

On the other hand, Mazur (2007) did not find a significant relation between the corporate tax rate and the leverage of Polish firms trading on the Warsaw Stock Exchange. His sample included 238 companies belonging to 13 industries.

Nur (2014) in a study of Malaysian firms listed in the Kuala Lumpur Stock Exchange found that as the corporate tax rate increases, companies are forced to lower corporate taxes which would lead them to utilize more debt in their capital structures.

Age

The pecking order theory suggests that older companies are less likely to use debt financing because they have more time to accumulate funds. Consistent with this theory Hall et al. (2000) carried out a study in the UK on small and medium sized enterprises and found that leverage was related negatively to age.

Contrary to the findings of Hall et al.(2000), Zhang (2010) and Nur (2014) found that age did not have a significant relationship with the leverage of the firm.

Size

Another important potential determinant of capital structure can be the size of the firm. According to the trade-off theory, debt levels increase with the size of the company. Therefore, large firms tend to have more debt as they have lower bankruptcy costs. This is supported by a study done by Saylgan et al. (2006) showing that size has a positive association with the leverage ratio, and that it is a significant determinant of the capital structure decisions of Turkish manufacturing firms.

Later on, Zhang (2010) showed that size was positively related to the debt/equity ratio of British manufacturing firms. .

The pecking order theory suggests that large companies have less incentive to issue debt because the asymmetric information will be smaller between the company and the investors. During a study done on the determinant of the capital structure of KSE listed pharmaceutical companies of Pakistan, Masnoon (2012) found that size had a negative relation with leverage.

Umer (2014) also found that size is positively correlated with leverage when analyzing the determinants of the capital structure of companies in Ethiopia.

Contrary to the studies mentioned above that found a relation between size and the leverage of the firm, a study done on Japanese manufacturing companies listed in the Tokyo Stock Exchange showed that size does not have a significant relation with capital structure (Cortez & Susanto, 2012).

Conceptual Framework

Although, the review of literature seems to suggest that there is no complete agreement from different research findings in studies done in different countries, the four variables reviewed above where chosen to form the framework to test the Colombian case.

The following framework is the result of the review of the literature. This conceptual framework is used to test the relationship between company characteristics (tangibility, corporate tax rate, age and size of the company) and capital structure decisions.

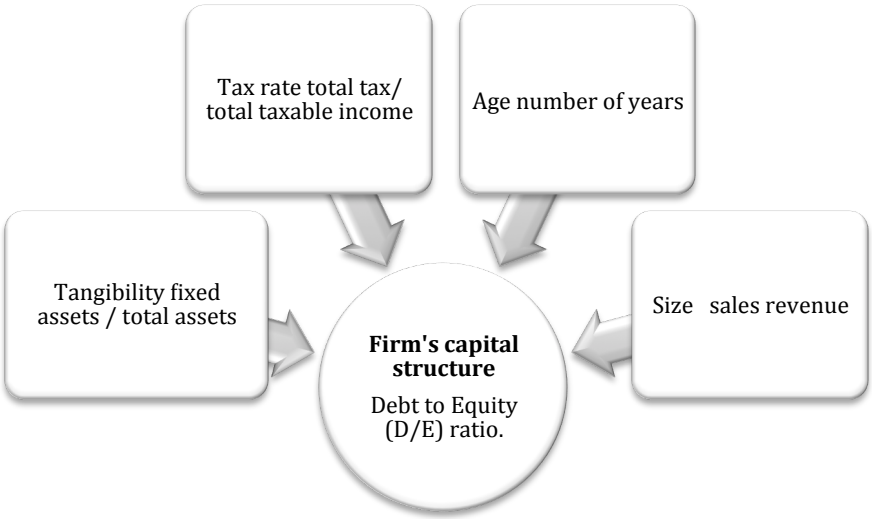

Figure 1. Conceptual framework

The dependent variable in this research study is ***leverage ratio*** (firm's capital structure) which is calculated as total debt divided by total equity. The independent variables of this study are: ***tangibility*** (calculated as fixed assets/total assets), ***corporate tax rate*** (calculated as total tax/total taxable income), ***age of the company*** (in years), and ***company size*** (measured as sales revenue).

Hypothesis

Tangibility

According to the trade-off theory, a statistically significant positive relationship is expected between debt/equity ratio and the tangibility of assets.

Hence, the following hypothesis is included in the study.

H_1: Tangibility is significantly and positively related to leverage ratio (firm's capital structure).

Corporate Tax Rate

According to Modigliani and Miller's proposition, a statistically significant positive relationship between the corporate tax rate and leverage should be expected.

Hence,

H_2: Corporate tax rate is significantly and positively related to leverage ratio (firm's capital structure).

Age of the company

According to the pecking order theory a statistically significant negative relationship between the age of the company and leverage should be expected.

Hence,

H_3: Age is significantly and negatively related to leverage ratio (firm's capital structure).

Size of the company

According to the trade-off theory, a statistically significant positively relationship is expected between debt/equity ratio and the size of the companies.

H_4: Size is significantly and positively related to leverage ratio (firm's capital structure).

Research Methodology

Research Design

A quantitative approach was used in this research to determine the relationships between the independent variables and the independent variable. A Pearson correlation coefficient (Veal, 2005) was used to analyze the linear dependence between leverage (firm's capital structure) and the independent variables (tangibility, corporate tax rate, age, and company size).

Data used in this study was collected from the Colombian Stock Exchange website and from the companies' annual reports posted in their websites.

PASW version 21 was used to carry out statistical procedures to determine correlations between the dependent variable and the independent variables.

Numerical data was used to answer the research question.

Sample Selection

Since the Colombian industrial sector is small, the whole population was chosen for the study. The Colombian Stock Exchange lists a total of forty four (44) companies. However, only thirty five (35) of them make their financial data available. Data used in this study was collected from their public annual reports available in their websites and the Colombian stock exchange website. Two years of financial data was used for the analysis (2011 to 2012). The characteristics of the companies selected vary in terms of industry sectors, years of experience, assets value, and leverage.

Characteristics of the Research Sample

Acerías Paz del Rio with 67 years of experience, this company is the only integrated steel company in the country. Its total assets were $2,431.551 COP million in 2011 and $2,262.518 COP million in 2012. Its debt to equity ratio was 0.79 in 2011 and 0.45 in 2012.

Agroguachal S.A. has 39 years of experience and is engaged in the cultivation and processing of agricultural products. Its total assets were $17.455.25 COP million in 2011 and $17,288.34 COP million in 2012. Its debt to equity ratio was 4.61 in 2011 and 1.66 in 2012.

Alimentos Derivados De La Cana S.A. has 19 years of experience and is engaged in the production and distribution of sugar cane and its derivatives. Its total assets were $81,588.70 COP million in 2011 and $92,087.93 COP million in 2012. Its debt to equity ratio was 0.80 in 2011 and 0.84 in 2012.

Avianca Holdings S.A. represents the integrated operation of several airlines that operate domestically and internationally. It has 96 years of experience. Its total assets were $3,975.688 COP

million in 2011 and $4,320.923 COP million in 2012. Its debt to equity ratio was 4.03 in 2011 and 4.75 in 2012.

Caracol Televisión S.A. was formed in August 1969, and over the last 46 years, it is dedicated to providing television services and the production of audiovisual content. Its total assets were $955.720 COP million in 2011 and $1,096.079 COP million in 2012. Its debt to equity ratio was 0.52 in 2011 and 0.66 in 2012.

Cartón De Colombia S.A also known as Smurfit Kappa Cartón De Colombia was founded in 1944 and over the last 71 years, it is engaged in the production of corrugated cardboard packaging, pulp and paper. Its total assets were $1,711.986 COP million in 2011 and $1,929.949 COP million in 2012. Its debt to equity ratio was 0.25 in 2011 and 0.22 in 2012.

Carvajal Empaques S.A specializes in the design, production and distribution of disposable, single-use packaging. It has 40 years of experience. Its total assets were $846.102 COP million in 2011 and $862.398 COP million in 2012. Its debt to equity ratio was 5.03 in 2011 and 1.41 in 2012.

Castilla Agricola S.A. is an agricultural and Livestock Company founded in 1940. Its total assets were $370.620 COP million in 2011 and $442.854 COP million in 2012. Its debt to equity ratio was 0.08 in 2011 and 0.06 in 2012.

Celsia S.A E.S.P is an electric utility company with direct operations in power generation and participation in the distribution of energy. It has 96 years of experience. Its total assets were $6,796.027 COP million in 2011 and $6,840.008 COP million in 2012. Its debt to equity ratio was 1.02 in 2011 and 0.85 in 2012.

Cementos Argos S.A. is a company that produces and markets cement and ready-mix. It has 81 years of experience. Its total assets were $16,781.066 COP million in 2011 and $10,266.716 COP million in 2012. Its debt to equity ratio was 0.44 in 2011 and 0.78 in 2012.

Cemex Latam Holdings S.A is a regional leader in the building solutions industry. It has 109 years of experience. Its total assets were 2,386.470 COP million in 2011 and $6,963.270 COP million in 2012. Its debt to equity ratio was 0.88 in 2011 and 2.21 in 2012.

Colombina S.A. is a food company that has been running for 88 years. It is the leader in confectionery and second largest chocolate, preserves and ice-cream producer in Colombia. Its total assets were $1,012.489 COP million in 2011 and $1,108.537 COP million in 2012. Its debt to equity ratio was 1.35 in 2011 and 1.29 in 2012.

Coltejer S.A. is a market leader in the textile sector with 108 years of experience. Its total assets were $606.204 COP million in 2011 and $614.845 COP million in 2012. Its debt to equity ratio was 0.61 in 2011 and 0.28 in 2012.

Compania Agricola San Felipe S.A. has 39 years of experience and is engaged in the production and distribution of sugar cane and its derivatives. Its total assets were $18,115.42 COP million in 2011 and $18,277.91 COP million in 2012. Its debt to equity ratio was 0.05 in 2011 and 0.03 in 2012.

Compania De Empaques S.A. is a company with 77 years of experience in manufacturing and marketing products made of natural (fique) and synthetic fibers, for the oil, gas, mining, construction, infrastructure, and agribusiness sectors. Its total assets were $203.253 COP million in 2011 and $214.413 COP million in 2012. Its debt to equity ratio was 0.40 in 2011 and 0.35 in 2012.

Construcciones El Condor S.A. is a Colombian engineering company with 36 years of experience, engaged in the development and investment in public and private infrastructure. Its total assets were $697.582 COP million in 2011 and $809.042 COP million in 2012. Its debt to equity ratio was 0.58 in 2011 and 0.30 in 2012.

Coomeva Entidad Promotora De Salud S.A is in charge of enrollment, member registration, collections, transfers and application of contributions, promotion and prevention in health risk management and the organization and guarantee of mandatory health plan services. It has 20 years of experience. Its total assets were $563.796 COP million in 2011 and $754.521 COP million in 2012. Its debt to equity ratio was 3.54 in 2011 and 6.24 in 2012.

Ecopetrol S.A. has 94 years of experience. It is the nation's only integrated crude oil and gas company (E&P, transport, refining and petrochemical). Its total assets were $92,277.386 COP

million in 2011 and $113,879.578 COP million in 2012. Its debt to equity ratio was 0.65 in 2011 and 0.72 in 2012.

Enka De Colombia S.A. founded in 1964, is one of the leading producers of nylon and polyester in Latin America. Its total assets were $538.264 COP million in 2011 and $552.161 COP million in 2012. Its debt to equity ratio was 0.21 in 2011 and 0.25 in 2012.

Fabricato S.A is a company that has been in the textile market for 94 years. It is engaged in the production and marketing of fabrics based on highly specialized international quality standards. Its total assets were $1,210.391 COP million in 2011 and $1,106.638 COP million in 2012. Its debt to equity ratio was 0.37 in 2011 and 0.41 in 2012.

Fogansa S.A. is a partially government-owned company with 74 years of experience in everything related to cattle farming. Its total assets were $109.713 COP million in 2011 and $107.089 COP million in 2012. Its debt to equity ratio was 0.07 in 2011 and 0.07 in 2012.

Fondo Ganadero Del Tolima has 53 years of experience and is engaged in the production, processing and marketing of agricultural goods and services. Its total assets were $16,569.96 COP million in 2011 and $19,249.15 COP million in 2012. Its debt to equity ratio was 0.22 in 2011 and 0.15 in 2012.

Grupo Orbis S.A is a Colombian multinational group focused on Latin America. It was established in 1921, its four main businesses are: Paint (Pintuco). Trade (Mundial). Water (O-tek), and Chemical (Andercol). Its total assets were $1,909.773 COP million in 2011 and $2,218.125 COP million in 2012. Its debt to equity ratio was 1.36 in 2011 and 1.61 in 2012

Industrias Estra S.A. is a Colombian company specialized in plastic solutions for homes and industries. It has 62 years of experience. Its total assets were $100.055 COP million in 2011 and $89.219 COP million in 2012. Its debt to equity ratio was 0.62 in 2011 and 0.91 in 2012.

Interconexion Electrica S.A. E.S.P. focuses its activities on the businesses of Electrical Energy Transmission, Telecommunications Transport, Road Concessions, and the Intelligent Management of Real-Time Systems. It has 31 years of experience. Its total assets were $26,659.165 COP million in 2011 and $25,770.989 COP million in 2012. Its debt to equity ratio was 2.46 in 2011 and 2.53 in 2012.

Inversiones Venecia S.A. has 35 years of experience and is engaged in the production, and exploitation of sugar cane and its by-products. Its total assets were $24,281.53 COP million in 2011 and $ 24,564.33 COP million in 2012. Its debt to equity ratio was 0.0076 in 2011 and 0.0042 in 2012.

Mayaguez S.A. is a leading agribusiness company in the production of sugar, biofuels and bioenergy, with 78 years of experience. Its total assets were $768.391 COP million in 2011 and $869.382 COP million in 2012. Its debt to equity ratio was 0.40 in 2011 and 0.24 in 2012.

Mineros S.A. is a private Colombian business group with 40 years of experience, dedicated to the exploration and mining of precious metals, especially gold. Its total assets were $516.273 COP million in 2011 and $608.773 COP million in 2012. Its debt to equity ratio was 0.18 in 2011 and 0.14 in 2012.

Organizacion Terpel S.A. has 47 years of experience and is engaged in the production, and exploitation of sugar cane and its by-products. Its total assets were $3,527,033.92 COP million in 2011 and $3,807,598.94 COP million in 2012. Its debt to equity ratio was 1.14 in 2011 and 1.33 in 2012.

Pacific Rubiales Energy Corp is the premier independent company, leading oil and gas E&P Company in Latin America, and the second largest producer of crude oil and gas in Colombia. It has 11 years of experience. Its total assets were $10,585.393 COP million in 2011 and $12,531.467 COP million in 2012. Its debt to equity ratio was 0.87 in 2011 and 0.78 in 2012.

Productos Familia S.A. is a company that generates well-being, through hygiene solutions for persons, home and professional care with leading brands. It has 57 years of experience. Its total assets were $1,316.848 COP million in 2011 and $1,426.631 COP million in 2012. Its debt to equity ratio was 0.35 in 2011 and 0.30 in 2012.

R.C.N. Television S.A. is a company dedicated to providing television services and the production of audiovisual content. It has 48 years of experience. Its total assets were $855.173 COP million in 2011 and $916.156 COP million in 2012. Its debt to equity ratio was 0.33 in 2011 and 0.39 in 2012.

Riopaila Agricola S.A. is an Agricultural and Livestock Company founded in 1928. Its total assets were $344.489 COP million in 2011 and $416.847 COP million in 2012. Its debt to equity ratio was 0.11 in 2011 and 0.09 in 2012.

Riopaila Castilla S.A. is an agribusiness company with 97 years of experience. Its total assets were $907.192 COP million in 2011 and $1,009.619 COP million in 2012. Its debt to equity ratio was 0.41 in 2011 and 0.49 in 2012.

Tablemac S.A. is engaged in the production of wood panels for building, furnishing, display atmosphere and remodeling spaces. It has 27 years of experience. Its total assets were $245.455 COP million in 2011 and $361.635 COP million in 2012. Its debt to equity ratio was 0.37 in 2011 and 0.32 in 2012.

Results of Study

Descriptive Statistics

Table 1. Descriptive statistics

Characteristics	Frequency	Percentage
D/E ratio		
Below 0.5	17	48.6
0.5-0.1	9	25.7
0.1-1.5	4	11.4
1.51-2.0	0	0
Above 2.1	5	14.3
Total	35	100
Tangibility		
Below 0.1	12	34.3
0.1-0.2	12	34.3
0.21-0.3	7	20
0.31-0.4	1	2.9
0.41-0.5	3	8.6
0.51-0.6	0	0
Total	35	100
Tax rate		
Below 0.5	25	71.4
0.5-1.0	7	20
1.1-1.5	0	0
1.51-2.0	1	2.9
Above 2.1	2	5.7
Total	35	100
Age		
Below 20	2	5.7
20-40	9	25.7
41-60	6	17.1
61-80	7	20
81-100	9	25.7
101-120	2	5.7
Total	35	100
Size		
Below 1 billion	25	71.4
1.0-5.0 b	6	17.1
5.1-10 b	2	5.7
10.1-15 b	1	2.9
15.1-20 b	1	2.9
Total	35	100

The majority of the companies (48.6%) recording a D/E ratio below 0.5. Nine (9), (25.7%) recorded a debt to equity ratio of 0.5-0.1 over the period. Another four (4), (11.4%) recorded a D/E ratio of 0.1-1.5. None of the companies recorded a D/E of between 1.51 and 2.0. Only 14.3% of the companies recorded a D/E ratio of above 2.1.

Twelve (12) out of the 35 companies (34.3%) recorded a tangibility below 0.1, another twelve (12) companies (34.3%) indicated a tangibility between 0.1-0.2. Additional seven (7) companies (20%) indicated a tangibility between 0.21-0.3; while another one (1) (2.9%) fell under 0.31-0.04. The remaining three (3), (8.6%) recorded a tangibility of above 0.4.

The modal age of the companies assessed was between 20 to 40 years and 81 to 100 years with nine (9) (25.7%) companies.

In regards to the tax rate, the majority of the companies (71.4%) recorded a tax rate below 0.5. Seven (7) companies (20%) recorded a tax rate of 0.5-1.0 over the period. None of the companies recorded a tax rate of between 1.1-1.5. The tax category 1.51-2.0 had the least number with only one (1) company (2.9%) falling under this category. Another two (2) companies (5.7%) recorded a tax rate of above 2.1.

The descriptive statistics indicated that majority of companies assessed were small in size with 71.4% falling below 1 billion in sales. 17.1% of them recorded sales between 1 and 5 billion. And another 5.7% recorded sales between 5.1 and 10 billion. Only 5.8% of the companies recorded sales above 10 billion.

Correlation

Table 2. Correlation between leverage (firm's capital structure) and the independent variables (tangibility, corporate tax rate, age, and company size)

Table 2. Pearson Correlation Coefficient

		D/E ratio	Tangibility	Tax rate	Age	Size	Year
D/E ratio	Pearson Correlation	1	-.159	.160	-.060	.377**	-.021
	Sig. (2-tailed)		.189	.186	.624	.001	.864
	N	70	70	70	70	70	70

Pearson's correlation coefficient was used to analyze the relationship between the independent and dependent variables. The relationship between D/E ratio (firm's capital structure) and tangibility is negative. This means that as tangibility increases the D/E ratio decreases. Pearson's correlation shows that (r=-.159, p=.189 > a=0.05), meaning that there was no statistically significant relationship between tangibility and the leverage of the company. The research hypothesis H_1 was thus rejected.

The correlation between D/E ratio (firm's capital structure) and taxes is positive as indicated by Pearson's correlation (r=.160, p=.186 > a=0.05). This implies that D/E ratio increases with the tax rate. As the corporate tax rate is raised, firms utilize more debt in their capital structures. However, the relationship between taxes and D/E ratio is statistically insignificant. . Therefore, the research hypothesis H_2 was rejected.

The age of the company negatively correlates with the D/E ratio. This implies that the older companies have a lower D/E ratio than the young companies. Pearson's correlation shows that (r=-.06, p=.624 > a=0.05). Thus, this relationship is not statistically significant.. Therefore, the research hypothesis H_3 was rejected.

Finally, there exists a statistically significant positive correlation between size and D/E ratio ($r=.377$, $p=.001 < 0.05$). This implies that the D/E ratio (firm's capital structure) increases with the size of the company. The bigger companies have a higher D/E ratio than the smaller ones. The research hypothesis H_4 was therefore retained.

Discussion

As an answer to the research question: Is there a statistically significant relationship between tangibility, corporate taxes, age, the company size and the capital structure of listed Colombian companies in the industrial sector? The empirical study showed that only *size of the company* had a statistically significant positive correlation with the capital structure of Colombian companies which is consistent with the trade-off theory of capital structure. According to the trade-off theory, debt levels increase with the size of the company because they have lower bankruptcy cost. Therefore, we can conclude that although larger listed Colombian companies in the industry sector have more debt that the smaller ones, we cannot affirm that is due to lower bankruptcy costs.

This study also supports the studies done by Sayilgan et al. (2006), Zhang (2010), and Umer (2014). But, it contradicts the findings of Masnoon et al. (2012). Some possible explanations for this contraction could be the different time horizon used in his study and the strong differences in corporate culture.

Limitation of Study

This study faced the following limitations:

First, the focus was only on listed Colombian companies in the industrial sector, which is a small number although is one of the most important.

Second, only 80 percent of the companies make their financial data available. The remaining 20 percent could not be included in the study affecting the results of the study.

Third, the period of time used for the analysis may be small to fully understand the behavior of the variables involved in the study.

Future studies may use a larger sample size, and data for a longer period of time to fully analyze the relationships between the independent variables and the capital structure of Colombian firms.

Conclusion

The main objective of this study was to examine whether the chosen firm-specific factors (tangibility, corporate tax rate, age, and company size) had a relationship with the corporate choice of capital structure of thirty-five (35) Colombian listed companies of the industrial sector.

A set of financial data from 2011-2012 was evaluated using Pearson's correlation coefficient to test the relationship between the dependent and independent variables.

The results revealed that factors such as tangibility, taxes rate, and age don't have a statistically significant relationship with the leverage of the company (firm's capital structure). But, a positive statistically significant correlation between the size of the company and its capital structure was found, which indicates than debt levels increase with the size of the company.

A word of caution is necessary. The study was based on secondary data available online at the Colombia Stock Exchange website and companies' annual reports. The study sample was restricted to two years only: 2011-2012. Only listed companies in the industrial sector were analyzed, and only four factors (Tangibility, taxes rate, size and age) were used. The results may not be appropriate for making wide inference.

These limitations present a potential opportunity for future studies. It is suggested that future studies use a larger sample size to fully capture the relationship between the independent variables and the capital structure of the companies. Additional variables may be included.

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