

Financial sustainability in SMEs in the lodging sector: business models and transformations.

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Abstract: Sustainability and technological transformations play an important role in the global economy and in the growth of companies. Therefore, the objective was to analyze the effect of technological transformations on the financial sustainability of SMEs in the lodging sector, as well as the relationship between liquidity and indebtedness of these companies. To this end, [1] A systematic literature review and bibliometric analysis was carried out using VOSviewer and Biblioshiny. [2] A test of differences in means (T-student) was performed between the variables technological transformation (categorical) and financial sustainability (continuous), in order to verify the hypothesis: H_a : there are no statistically significant differences in financial sustainability between companies in the lodging sector in Bolívar that do or do not apply technological transformation processes. The sample corresponds to financial information as of 2022 of SMEs in the department of Bolívar (29) and the Bogotá D.C. region (74), taken from the Integrated Corporate Information System - SIIS portal of the Colombian Superintendency of Companies. This selection is based on the ranking of the Colombian Regional Tourism Competitiveness Index - ICTRC. [3] A correlation analysis was carried out to test hypothesis H_b : there is a positive effect between indebtedness and liquidity risk, with independent variable indebtedness level and dependent variable liquidity. For this purpose, Spearman's coefficient was calculated. The findings reflect that there is little research on financial sustainability and digital transformation processes in SMEs in Colombia, unlike in other parts of the world. Regarding the T-test, no statistically significant differences were found between financial sustainability and the application or not of technological transformation processes in the companies analyzed. This motivates research and business strengthening in this field of study, and the creation of synergies between the business and academic sectors.

Keywords: project management, Financial Sustainability, SMEs, Technological Transformation, Liquidity Risk.

Sostenibilidad financiera en Pyme del sector de alojamiento: modelos y transformaciones empresariales.

Resumen: La sostenibilidad y las transformaciones tecnológicas cumplen un importante rol en la economía global y en el crecimiento de las empresas. Por ende, se trazó como objetivo analizar el efecto de las transformaciones tecnológicas en la sostenibilidad financiera de las Pyme del sector de alojamiento, así como la relación entre la liquidez y el endeudamiento de estas empresas. Para ello, [1] Se realizó revisión sistemática de la literatura y análisis bibliométrico, con soporte en VOSviewer y Biblioshiny. [2] Se realizó prueba de diferencias de medias (T-student) entre las variables transformación tecnológica (categórica) y sostenibilidad financiera (continua), a fin de verificar la hipótesis: H_a : no existen diferencias estadísticamente significativas en la sostenibilidad financiera,



entre las empresas del sector alojamiento en Bolívar que aplican o no procesos de transformación tecnológica. La muestra corresponde a información financiera a 2022 de Pyme del departamento de Bolívar (29) y la región Bogotá D.C. (74), tomada del portal Sistema Integrado de Información Societaria – SIIS, de la Superintendencia de Sociedades de Colombia. Dicha selección se fundamenta en el ranking del Índice de Competitividad Turística Regional de Colombia – ICTRC. [3] Se realizó un análisis de correlación, a fin de probar la hipótesis H_b : existe un efecto positivo entre el endeudamiento y el riesgo de liquidez, con variable independiente nivel de endeudamiento y variable dependiente liquidez. Para ello, se calculó el coeficiente de Spearman. Los hallazgos reflejan que es escasa la investigación en torno a la sostenibilidad financiera y los procesos de transformación digitales en Pyme de Colombia, a diferencia de otras partes del mundo. Respecto a la prueba T-test, no se encontraron diferencias estadísticamente significativas entre la sostenibilidad financiera y la aplicación o no de procesos de transformación tecnológica en las empresas analizadas. Lo anterior, motiva la investigación y fortalecimiento empresarial en este campo de estudio, y creación de sinergias entre el sector empresarial y académico.

Palabras clave: Gestión de Proyectos, Sostenibilidad Financiera, Pyme, Transformación Tecnológica, Riesgo de liquidez

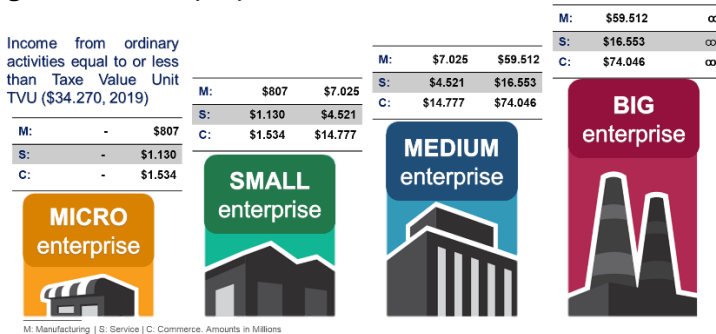


Introduction

An approach to Colombian microenterprises.

According to Decree No 957 of June 05, 2019 in its Article 2.2.2.1.13.2.2, microenterprises in Colombia are determined taking into account the range of their income from annual ordinary activities, according to the economic sector in which they are located, as illustrated in Figure 3:

Figure 1. New company classification in Colombia



Note: M: Manufacturing | S: Service | C: Commerce. Amounts in Millions

Source: based on [1]

The manufacturing sector is made up of those whose income from ordinary annual activities is less than or equal to 23,563 Tax Value Units (UVT), for the services sector, with income from ordinary annual activities less than or equal to 32,988 UVT, and the commerce sector with income from ordinary annual activities less than or equal to 44,769 UVT.

Financial sustainability in SMEs in the lodging sector.

The objective of any company, regardless of its size and scope of activity, is based on maintaining a stable financial situation and results, which is associated with financial sustainability [2], [3]. This financial equilibrium is one of the most important aspects in relation to the financial stability of an economic entity and its long-term financial sustainability, which significantly reduces the risk of bankruptcy, ensures healthy financing, efficient use of the company's assets and guarantees an exclusive advantage over companies that have an unfavorable situation [4]. Consequently, one of the economic activities with the greatest volatility in its financial flows is undoubtedly the lodging sector, which is closely related to the tourism industry, whose growth could have a strong influence on the organizational performance of the hotel industry. Therefore, the expansion of tourism activities directly enhances the development of the hotel industry, increasing the occupancy rate and, consequently, sales revenue [5]. However, in order for companies to be more competitive and achieve their financial objectives, they must invest in processes to transform their business models, strategies and operations, which is related to the concept of financial sustainability [6]. Moreover, a company's financial performance depends on its ability to generate revenues and maintain stable business continuity [5]. Thus, to ensure sustainable existence and growth, companies must analyze the correlations between the assets they own and use, together with their sources of financing, in order to assess the extent to which these are related to their fixed and working capital requirements [7]. Therefore, the use of an optimal mix of investments and sources of financing ensures the highest level of financial sustainability, which translates into a greater capacity to generate value for the owners and provide continuity of operations over the long term [2].

Technological transformations: key tools for SME strengthening.

Technological transformation has constantly evolved, generating countless possibilities to access the world. Thus, the Internet has radically changed the way in which people communicate, seek information, make decisions and, above all, purchase goods and services, generating a considerable growth in electronic distribution channels [8]. In line with the above, several authors [9], [10], [11] have extensively explored the consequences of adopting new technologies and practices on the overall improvement of organizational performance. In this order of ideas, it can be stated that the digital orientation focuses on collaboration and the amalgamation of technological and business strategies [12], providing guidance and principles through which organizations adopt and use technologies to achieve superior advantage and sustainable growth [13]. It should be noted that, “travel products in particular have proven to be some of the most suitable ones to sale online” [8]. In fact, it has been stated that SMEs with digitalization processes survive in international markets [14], facilitates organization, to improve communication and information processing [15], [16], [17], increase operational efficiency [18], and expand their businesses [19]. Therefore, companies' orientation towards digitization contributes to organizational learning and information sharing, which is essential for business continuity [20]. However, resource scarcity, financial constraints, lack of technical know-how and government policies are the main challenges and barriers faced by SMEs to organizational digital orientation [21], [22], [23]. Although SMEs lack the necessary skills, they need to use new technologies and methods such as the Internet of Things and artificial intelligence to remain competitive [24].

Lodging sector: business models and transformations.

Hospitality and tourism industry became vital to the economic development in several regions worldwide [25]. However, this sector, like others, has resorted to transforming its business models as a result of the opening of markets and the technology revolution, whose rapid advances in innovation, especially smartphones and Internet services, have led to changes in consumer behaviors [26], leading many companies to move from developing tangible products to providing services [27], [28], [29]. According to [30], SMEs in the tourism sector must be at the forefront of technologies and propose devices, techniques and technological achievements using the most current and high-level IT developments. Thus, in the digital economy, most of the hoteliers need to face with the new challenging on emerging strategic issues and concerns which were the impact from the information and telecommunication technology revolution [31]. “In SMEs, digital technologies will mark the beginnings of a new business change” [32]. However, much remains to be done in the SME sector [33].

Methodology

Planning

In this first stage, the bibliometric analysis is prepared, for which the scientific databases Scopus and Web of Science (WoS) were selected as inputs in the search for information (Table 1).

Table 1. Design of the search strategy

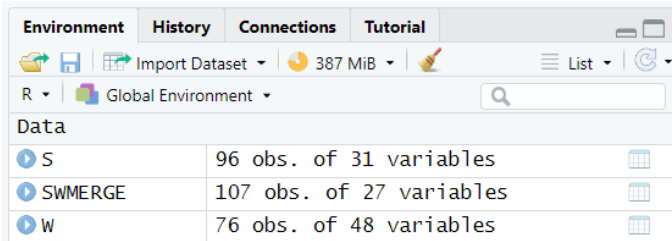
Step	Applied search terms Words used	Number of publications	
		Scopus®	WOSTM
1	("financial sustainability") AND ("SME*" OR "SMEs" OR "smallor medium-sized enterprises" OR "small and medium-sized enterprises" OR "small to midsize enterprise" OR "small and medium sized business" OR "Small and Medium-Sized Entities" OR "lodging sector" OR "hotel*")	45	22
2	("sustainable business model*") AND ("SME*" OR "SMEs" OR "smallor medium-sized enterprises" OR "small and medium-sized enterprises" OR "small to midsize	87	56

	enterprise" OR "small and medium sized business" OR "Small and Medium-Sized Entities" OR "lodging sector" OR "hotel*")		
3	("financial sustainability" OR "sustainable business model*") AND ("SME*" OR "SMEs" OR "smallor medium-sized enterprises" OR "small and medium-sized enterprises" OR "small to midsize enterprise" OR "small and medium sized business" OR "Small and Medium-Sized Entities" OR "lodging sector" OR "hotel*")	132	78
4	When filtering by item, the result is:	96	76
5	("technological change" OR "technology*" OR "digital tools") AND ("sustainable business model*" OR "financial sustainability") AND ("SME*" OR "SMEs" OR "smallor medium-sized enterprises" OR "small and medium-sized enterprises" OR "small to midsize enterprise" OR "small and medium sized business" OR "Small and Medium-Sized Entities" OR "lodging sector" OR "hotel*")	23	16
6	Adding the results of the steps, the following results are obtained:	119	92

Source: own elaboration

After searching for articles through the equations, the information was migrated in *BibTeX* format to the RStudio software, where the debugging and filtering process was carried out using the *mergeDbSources* command. The result yielded a total of 107 observations with 27 variables.

Figure 2. Unification and cleaning of information



Source: R Studio

Data Description

To obtain the sample, the financial statements were extracted from the SIIS portal of Supersociedades, for the period 12/31/2022 for SMEs-Individuals. This query yielded a population of 24,536 companies that reported for the period analyzed. Subsequently, a filter was performed according to the activities: I5511 - Hotel accommodation, I5512 - Aparthotel accommodation, I5513 - Resort accommodation, I5514 Rural accommodation, I5519 - Other types of accommodation for visitors, I5520 - Activities of camping areas and parks for recreational vehicles, I5530 - Accommodation services by the hour and I5590 - Other types of accommodation n.e.c., which yielded 290 companies from different departments. Subsequently, the companies from the departments of Bolivar and the city of Bogota were filtered, obtaining a final result of 29 and 74 companies. With the Statement of Financial Position and Income Statement of the selected companies, the different financial indicators were calculated: Acid Test - AT, Working Capital Ratio - WK, Cash Ratio - CT, Current Ratio - CR, Accounts Receivable Turnover - AR, Gross Margin - GM, Operating Margin - OM, Net Margin - NM, Return on Assets - RA, Return on Equity - RE, Total Indebtedness - TI, Financial Indebtedness - FI, Total Leverage - TL and Financial Leverage - FL, necessary for the correlational analysis and the T-test. On the other hand, dichotomous variables were defined as Technology - TCN, Website - WP, Sustainable Development Goals - SDG and Sustainability Reports - SR, obtained through the websites and reports of each of the companies in the sample.

Hypothesis

To achieve the objective authors worked with a correlational approach [34], [35], and sought to corroborate the following hypothesis: H_a : there are no statistically significant differences in financial sustainability between companies in the lodging sector in Bolívar that do or do not apply technological transformation processes, H_b : There is a positive relationship between capital structure and liquidity risk, and the hypothesis. For the first hypothesis, the independent variable was "technological transformation" (categorical) and the dependent variable was "financial sustainability" (continuous), the latter measured through liquidity and indebtedness indicators. For the second, capital structure was taken as an independent variable and liquidity risk as a dependent variable to prove that the higher the indebtedness, the higher the level of liquidity risk and vice versa.

Data analysis strategies

The data analysis was divided into two stages: [1] bibliometric analysis, [2] correlation and mean difference analysis. For the first one, bibliometric technological tools such as VOSviewer and R Biblioshiny - bibliometrix were also used. In addition, the authors used Mendeley reference manager to guarantee the quality of the citation and referencing. For the second, the R software Version 4.3.1 was used, where it was used for the bivariate correlation analysis, the leveneTest and ShapiroTest were applied for variance and normality validation. Given that the Bogotá database has 74 observations and the Bolívar database has 29, parametric tests of mean differences (T-Test) were performed for Bogotá and nonparametric tests (Mann-Whitney U) for independent samples of less than 30 observations in the case of Bolívar.

Results

Overview & Historical distribution of papers

Before starting with the bibliographic analysis, describing how the data is structured is essential. Figure 2 contains 106 articles taken from 71 sources, with the participation of 312 authors, among which a percentage of 0.9434% international co-authorship, with an average of 3.1 documents per author and 4.04 documents per year. The average annual citation presented an increase equivalent to 2.81%.

Figure 3. Main information & Annual Scientific Production

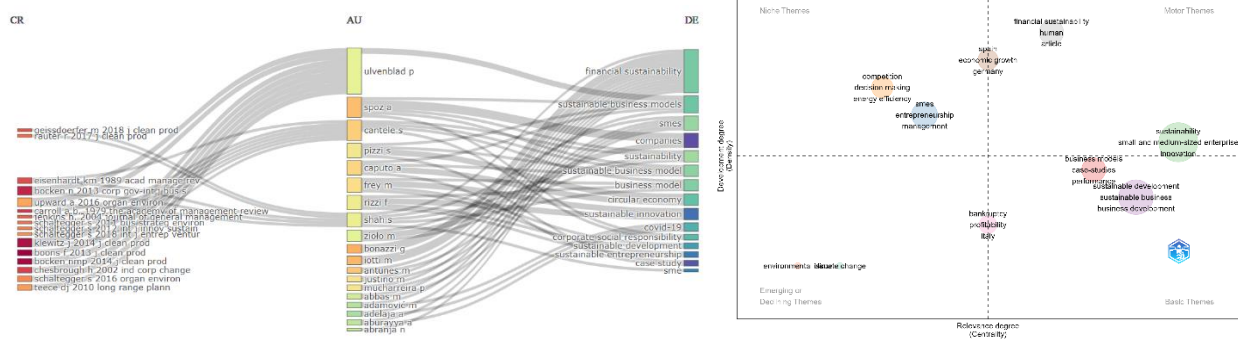


Source: Biblioshiny in R

Collaboration and research trends

In accordance with the previous figures, among the authors with the greatest production, Ulvenblad, P. out and has published on the topics of sustainable business models. On the other hand, there is Spoz, A. contributed to the lines of sustainable business models, sustainability & corporate social responsibility. Other authors on the list include Cantele, S., Pizzi, S., Caputo A., and Frey M., as shown in Figure 2.

Figure 4. Three-Field Plot & ThematicMap

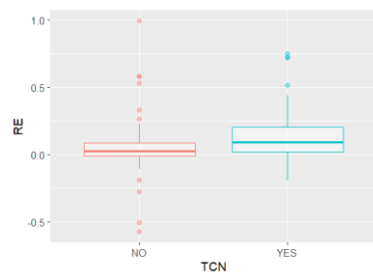


Source: Biblioshiny in R

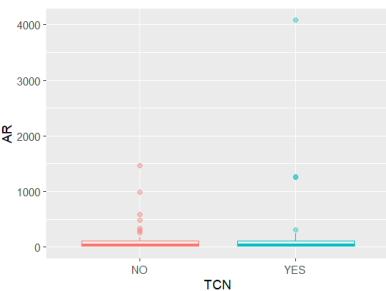
This figure also shows the topics that set a trend in research, for which the analysis is divided into four quadrants, where the driving themes such as sustainability, innovation, financial sustainability, which have been studied in SMEs, stand out. On the other hand, basic topics such as business models, sustainable development, sustainable business and business development are shown. As shown in Figure 2, these are topics that despite being located in the quadrant of basic topics, there is a tendency towards motor topics, given their connection with other areas of research.

Technological transformation processes in companies of the lodging sector in Bolivar and Bogota.

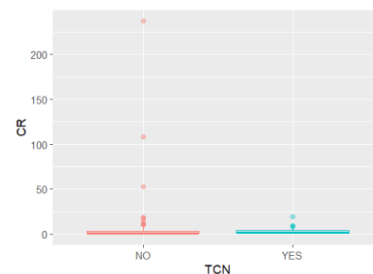
Figure 5. Bogota T-test analysis



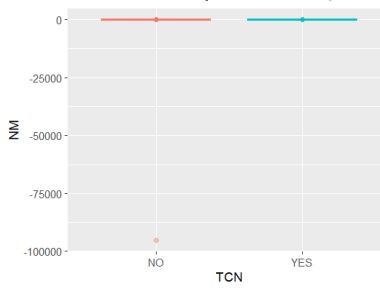
```
> t.test(RE ~ TCN, data = DATOS_B, var.equal = T)
data: RE by TCN
t = -1.8204, df = 72, p-value = 0.07285
```



```
> t.test(AR ~ TCN, data = DATOS_B, var.equal = T)
data: AR by TCN
t = -1.1741, df = 72, p-value = 0.2442
```



```
> t.test(CR ~ TCN, data = DATOS_B, var.equal = T)
data: CR by TCN
t = 1.1371, df = 72, p-value = 0.2593
```



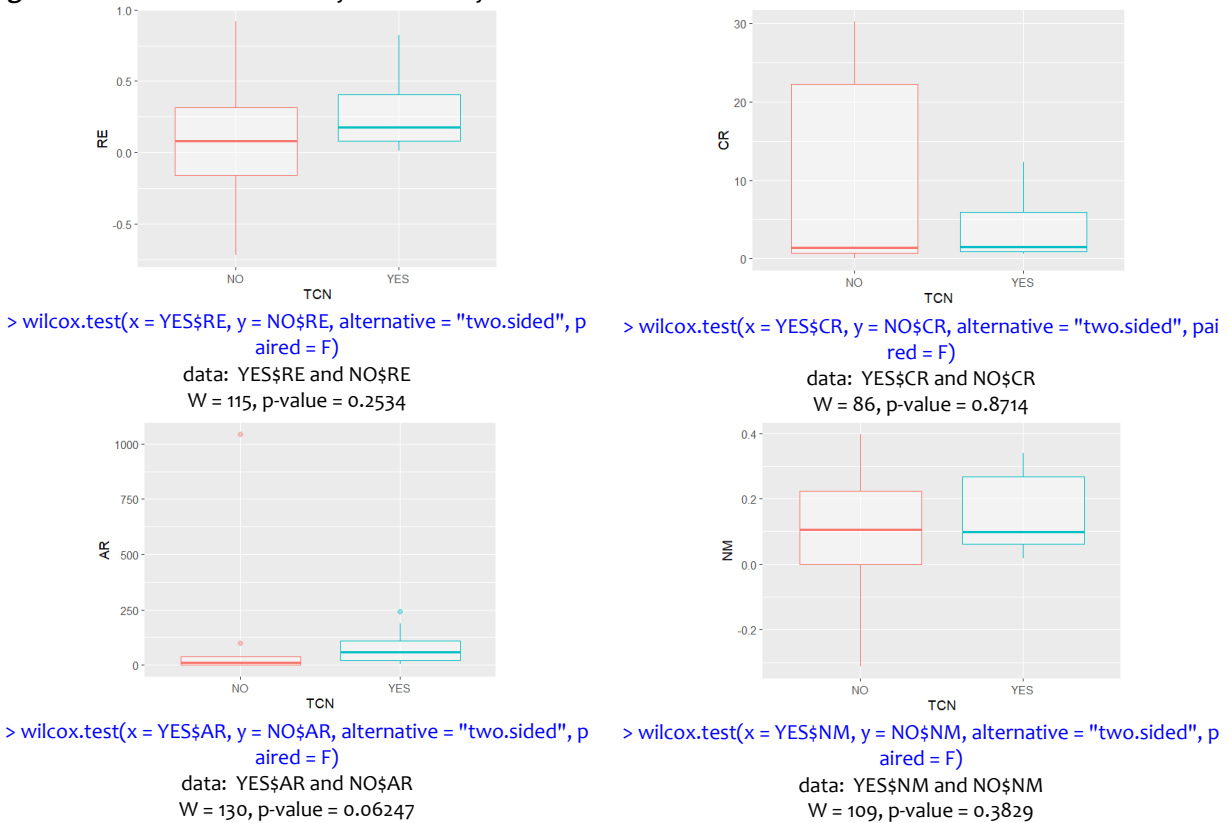
```
> t.test(NM ~ TCN, data = DATOS_B, var.equal = T)
data: NM by TCN
t = -0.77819, df = 72, p-value = 0.439
```

Source: R Studio 4.3.1

In the case of Figures 5 and 6, it can be observed that all variables are at the same level, which at first glance reflects the non-existence of a difference in means, although there are some outliers, which may in turn generate

the difference between the averages. However, the results of the test show that there are no statistically significant differences between the means of all the variables at a 5% significance level, both for Bolivar and Bogota. At the financial level, this means that the fact of applying technology in the selected companies has no effect on their profitability or liquidity. In other words, if the company makes the decision to invest in new technology, it will not increase or decrease profitability.

Figure 6. Bolivar Mann–Whitney U test analysis



Source: R Studio 4.3.1

Indebtedness and liquidity risk in companies of the lodging sector in Bolivar and Bogota.

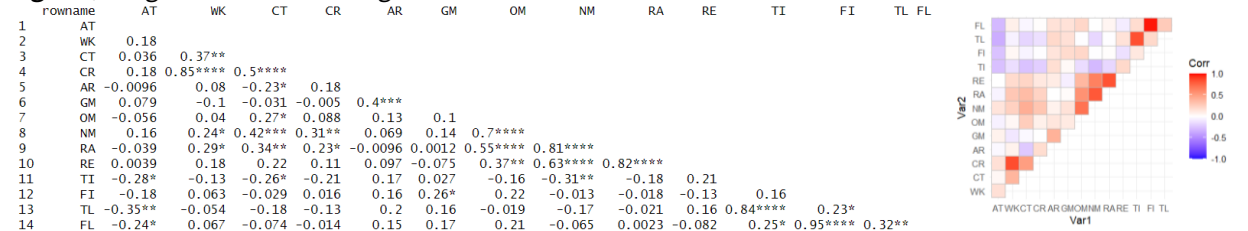
Since the goal of businesses is to achieve a stable financial position, called financial equilibrium, this can be analyzed with the help of specific indicators which are aimed at the relationship between the permanent and temporary needs compared to the permanent and temporary sources [7]. For this purpose, two types of indicators are used, i.e., indicators in absolute sizes such as working capital [36], working capital needs, net treasury, as well as indicators in relative sizes, such as liquidity and solvency ratios [37].

Accordingly, Figure 7 and 8 present the correlation analyses between the liquidity and indebtedness variables, in order to establish whether there is a relationship between indebtedness and liquidity risk.

Before analyzing the results in Figure 7 and 8, it is important to note that these are presented at the 0.01 ** and 0.05 * levels of bilateral significance. In this order of ideas, when analyzing the relationship between the liquidity and indebtedness variables of the companies of the lodging sector in Bogota, it is observed that in the case of the Acid Test - AT, it presents significant negative correlations at 0.01 with the Total Leverage indicator - TL (-.35), and significant negative correlations at 0.05 with the Total Indebtedness - TI (-.28) and Financial Leverage - FL (-

.24) indicators. On the other hand, when analyzing the Cash Ratio - CR, there is a significant negative correlation at 0.05 with the Total Indebtedness - TI indicator (-.26). The Working Capital Ratio - WK, Current Ratio - CR and Accounts Receivable Rotation - AR do not have a negative correlation with the debt indicators.

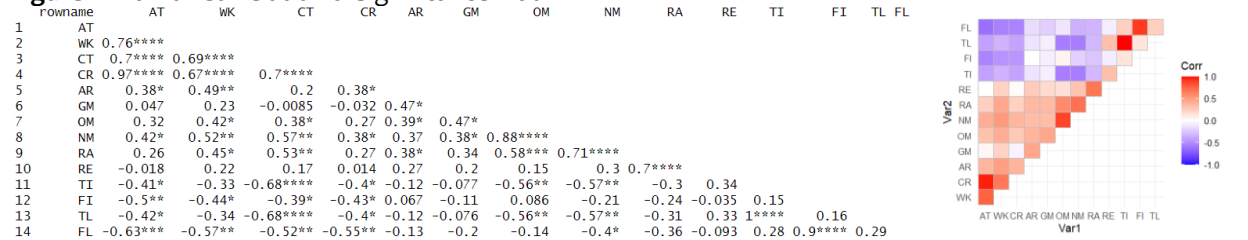
Figure 7. Bogota Correlation & Significance matrix



Source: R Studio

Following the previous, the null hypothesis is rejected, and the researchers' hypothesis is accepted since there is a negative correlation between the variables analyzed: AT, at 99% confidence; and TI and FI, at 95% confidence, as explained, which leads to corroborate the existence of a positive relationship between capital structure and liquidity risk.

Figure 8. Bolivar Correlation & Significance matrix



Source: R Studio

Regarding the analysis of the relationship between the liquidity and indebtedness indicators of the SMEs of the lodging sector in Bolivar, a negative correlation significant at 0.01 and 0.05 is observed between the indicators mentioned, except between the liquidity variable WK and the indebtedness variables TI and TL. In this order of ideas, the AT indicator presents significant negative correlations at 0.01 with the FI (-0.05) and FL (-0.63) indicators, as does the relationship between WK and FL (-0.57), CT and the TI (-0.68), TL (-0.68) and FL (-0.52) indicators, and finally the relationship between CR and FL (-0.55). With respect to the negative relationships significant at 0.05, the behavior between AT and the indicators TI (-0.41) and TL (-0.42), WK and FI (-0.44), CT and FI (-0.39), and finally CR and the indicators TI (-0.4), FI (-0.42) and TL (-0.4) was observed.

Conclusions

It was found that the relationship between liquidity risk and its financial structure is higher in Bolivar than in Bogota, which constitutes a challenge for lodging companies when applying for loans or leveraging the growth of their operations. However, when analyzing the relationship between the technological transformation processes and the increase in the company's profitability or liquidity, it is observed that there is no correspondence whatsoever, which highlights the fact that those companies interested in betting on new technologies that decide to leverage such growth through financial indebtedness, will be involved in risk levels that may lead them to incur not only in crisis but also in the possibility of bankruptcy.

This is in line with what was established by [4], for whom financial equilibrium is one of the most important aspects regarding the financial and economic stability of an entity, and its long-term financial sustainability.

The findings reflect that there is little research on financial sustainability and digital transformation processes in SMEs in Colombia, unlike in other parts of the world. Regarding the T-test, no statistically significant differences were found between financial sustainability and the application or not of technological transformation processes in the companies analyzed. This motivates research and business strengthening in this field of study, and the creation of synergies between the business and academic sectors.

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