



# Profitability, indebtedness and liquidity analysis of microenterprises in Ecuador

## Análisis de rentabilidad, endeudamiento y liquidez de microempresas en Ecuador

**Mg. Fernando José Zambrano-Farías** is a professor and researcher at the International University of Ecuador and the University of Guayaquil (fezambranofa@uide.edu.ec) (<https://orcid.org/0000-0001-6384-3353>).

**Lic. María Estefanía Sánchez-Pacheco** is an independent researcher, International University of Ecuador (masanchezpa@uide.edu.ec) (<https://orcid.org/0000-0002-2469-9018>)

**Mg. Sara Rocío Correa-Soto** is a professor and researcher at the International University of Ecuador (sacorreasoto@uide.edu.ec) (<https://orcid.org/0000-0002-6698-2890>)

### Abstract

*Microenterprises are an important factor in Ecuador's economic development. This research analyzes and compares financial indicators such as financial profitability, indebtedness and current liquidity of microenterprises in the province of Guayas with those in other provinces of Ecuador. The analysis used a quantitative methodology of descriptive type of cross-sectional design for 13,768 microenterprises in the province of Guayas and 16,093 microenterprises in the rest of the provinces of Ecuador that reported their financial statements to the Superintendence of Companies, Securities and Insurance as of 2019. To compare these groups, a t-test was performed for independent samples with unequal variances. The results of this research indicate that, with a 95% confidence level, average indebtedness and average current liquidity are higher in the province of Guayas while microenterprises in the rest of Ecuador report better average financial profitability. Although Guayas province has the highest percentage of microenterprises in the country, this is not a sufficient condition to conclude that its financial indicators, on average, are better than those of the rest of Ecuador. This research aims to make a contribution to the development of lines of work that contribute to the elaboration and design of policies that help the survival and business performance of microenterprises.*

### Resumen

Las microempresas representan un componente significativo para el progreso económico de Ecuador. Esta investigación analiza y compara indicadores financieros como la rentabilidad financiera, el endeudamiento y la liquidez corriente de las microempresas de la provincia del Guayas con las del resto de provincias de Ecuador. El análisis utilizó una metodología cuantitativa de tipo descriptiva de diseño transversal para 13 768 microempresas de la provincia del Guayas y 16 093 microempresas del resto de las provincias de Ecuador que reportaron su información financiera a la Superintendencia de Compañías, Valores y Seguros al año 2019. Para comparar estos grupos se realizó una prueba t para muestras independientes con varianzas desiguales. Los resultados de esta investigación indican que, con un nivel de confianza del 95 %, el promedio de endeudamiento y la liquidez corriente media son mayores en la provincia del Guayas mientras que las microempresas del resto de Ecuador reportan una mejor rentabilidad financiera promedio. A pesar de que la provincia del Guayas tiene el mayor porcentaje de microempresas en el país, no es condición suficiente para concluir que sus indicadores financieros, en promedio, son mejores que los del resto de Ecuador. Esta investigación pretende ser un aporte al desarrollo de líneas de trabajo que contribuyan a la elaboración y diseño de políticas que ayuden a la supervivencia y desempeño empresarial de las microempresas.

### Keywords | palabras clave

*Financial ratio, Student's t-test, profitability, microenterprises, business performance, corporate liquidity, indebtedness, finance.* Ratio financiero, prueba t de Student, rentabilidad, microempresas, desempeño empresarial, liquidez corriente, endeudamiento, finanzas.

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## 1. Introduction

Microenterprises are defined as small organizations managed by their owners, normally they are created by a member of a marginalized and vulnerable segment of the population that, in order to face capital limitations, lack of access to credit, and barriers to entry, adopt various organizational forms (González-Sánchez & Méndez-Vásquez, 2017; Muñoz et al., 2014). Often, the creation of these organizations is done empirically, that is, without the knowledge or experience necessary to evolve in a highly competitive market, resulting in a high rate of business failure in these companies when compared to those of larger size (Blázquez-Santana et al., 2006).

For Okurut (2008), microenterprises belong to the category of survival businesses, since their owners have the expectation of finding a formal job that allows them to improve the minimum income that their businesses produce, which would generate a competitive disadvantage compared to companies of big size. Authors such as Ampudia-Márquez (2008), Díaz-Arreguín (2010), Mungaray-Lagarda and Urquidy (2007) argue that despite the fact that impact policies have been developed for microenterprises, they tend to be of low transcendence since they do not respond to the demands of the sector.

The role of microenterprises is essential both in emerging societies and in societies with buoyant economies, which has allowed them to progress despite the limited support of government, commercial and financial organizations (de Jorge-Moreno et al., 2010; De Zoysa & Kanthi-Herath, 2007; Halabi et al., 2010; Steinerowska-Streb, 2012). These companies have contributed to job creation by offering opportunities to those who cannot find it while helping to reduce poverty rates thanks to their profitability (Rogerson, 2004; Zainol et al., 2017).

By their nature, microenterprises offer more affordable goods and services to the community because they tend to have a lower price (Rodríguez-Arrieta et al., 2019). Given the positive impact of microenterprises and the limited studies on their performance, the objective of this research work is to carry out a statistical comparison of the financial performance, level of debt to third parties, and current liquidity of microenterprises in the province of Guayas with the rest of the provinces of Ecuador. This study contributes to the literature, as it examines the financial behavior of microenterprises in an emerging country. Typically, studies of this type have been carried out in the context of the United States, Malaysia, Sweden, Poland, Uganda, Nigeria, Peru, and other countries (Adekunle, 2011; Janda et al., 2013; Muñoz et al., 2014; Rasiah et al., 2014; Schreiner & Woller, 2003; Ssebunya et al., 2019; Yazdanfar et al., 2013; Vargas-Vega et al., 2020).

The investigation is structured as follows. After a brief introduction, a summary of the existing literature is presented, where the antecedents of previous investigations that gave the guideline to carry out this investigation are presented. In addition to listing the assumptions or hypotheses to be tested.

The following section explains the selection of the sample and the used methodology, which is quantitative of a descriptive type of cross-sectional design, in order to analyze and compare the indicators of profitability, indebtedness, and liquidity, which are key in the studies of profitability of microenterprises. Next, the results of the investigation for the indexes of financial profitability, indebtedness, and solvency in the short term of the microenterprises of the province of Guayas and how these compare with those of the rest of the provinces of Ecuador are shown. Finally, the general conclusions of the study are presented.

## **1.1. Literature review**

Researchers in business dynamics, industrial economics, strategic management, accounting, and finance have attempted to identify sources of variation in business profitability (Goddard, Tavakoli, & Wilson, 2005). Different authors (Aulová et al., 2019; Floros & Voulgaris, 2016; Lososová & Zdeněk, 2014; Prijadi & Desiana, 2017; Rasiah et al., 2014; Spitsin et al., 2020) have proposed their theories about profitability in companies and their determinants applied to different societies, sectors, and approaches. For example, economic factors of business performance (external to the organization) and organizational factors (financial behavior of the company and suitability of the environment) have shown in previous research that they operate independently and that internal factors are more significantly and directly associated to business performance (Appiah-Adu et al., 2001). In fact, Muñoz et al. (2014) indicate that business performance was scarcely or not at all influenced by factors exogenous to the organization, but there is a moderate incidence between company-specific factors such as financial indicators, seniority, size, and managerial capabilities and the company's earnings. On the other hand, other authors (Floros & Voulgaris, 2016; Jasiniak & Pastusiak, 2014; Zeli & Mariani, 2009) argue that external factors such as the sector to which the firm belongs and its competitiveness are variables that significantly affect the generation of profitability.

Regarding the incidence of company-specific factors such as financial indicators, Goddard et al. (2005), Jinchuña-Huallpa (2021), and Campuzano and Rodríguez (2018) concluded that the leverage ratio of a firm and its profitability is negative but that there are companies that have greater liquidity and tend to be more profitable. Along the same lines, (Castillo-Valero & García-Cortijo, 2013; González-Pérez et al., 2002; Lin & Rowe, 2006; Wood, 2006) factors the level of indebtedness, liquidity in the short term and the size of the company have a strong and positively significant relationship with business performance.

For Yazdanfar et al. (2013), the study of the age of the organization in the market is important for the analysis of profitability, it indicates that the performance of the company changes systematically in the course of its permanence in the market, in this way, profitability is high in the first years of creation and as companies age and develop, their profitability decreases.

Other studies on microenterprises show a link between the administrative skills of their owners and their gender generate more sales but not profitability, while the participation of the owners in the business does not affect growth but adds profitability (Manzaneque et al., 2016; Prijadi & Desiana, 2017; Valls- Martínez & Cruz-Rambaud, 2019).

This research work takes as a reference studies previously carried out on the profitability of companies, to understand the subject, in Table 1 several authors are cited, along with their methodology, and the results.

**Table 1. Previous work on business performance**

Author	Methodology	Results
Sánchez (1994)	It analyzes the large non-financial Spanish companies, whether they are listed on the Stock Market or not.	He verified how the circumstances in which each sector develops its operations justify undertaking different paths towards the search for economic profitability.
González Pérez et al. (2002)	Uses descriptive analysis to explain the behavior and distribution of the variables generated from accounting information	Factors that affect financial profitability and that could explain possible insolvency scenarios were identified.
Cortés, Rayo and Lara (2011)	Analyze data from companies that reported their financial statements in countries such as Spain and Portugal	The factors that explain financial profitability come from financial ratios of profitability, indebtedness, and management.
Arcos-Mora and Benavides-Franco (2008)	Study the stages of cash during the fiscal year and its influence on the performance of non-financial companies in Colombia.	The performance of non-financial companies in Colombia is not determined by the level of cash the company has during the fiscal year.
Cano-Flores, Olivera-Gómez and Balderrabano-Briones (2013)	Analyzes the structure of the Statement of Financial Position and Statement of Income. The economic value of the company is obtained through financial indicators.	Return on equity or return on assets are the indicators that are frequently used when evaluating financial success or bad debt.
Rivera-Godoy and Ruiz-Acero (2011)	Evaluate business performance through financial indexes.	Management and administration indicators largely explain the generation of financial returns.
Salazar-Mosquera (2017)	Evaluates the financial ratios of asset management and return on investment as determinants of financial profitability, through the correlation coefficient.	The turnover of goods sold is the main determinant of financial profitability.
Cedeño, Ostaiza and Vélez (2018)	Descriptive study with a qualitative approach of successful microenterprises. The participant observation technique and interviews with representatives of these various sectors were applied.	The microenterprises included in the present investigation achieved success in some aspects, while in others it is limited or they still do not achieve anything.
Sánchez and Lazo (2018)	It uses an exploratory factor analysis to determine the variables that affect business performance.	The size of the company is key when measuring business survival, microenterprises are more likely to avoid scenarios of financial distress

Author	Methodology	Results
Sumba-Bustamante and Santistevan- Villacreses (2018)	Use field research to describe the performance of a sample of 347 microentrepreneurs from three towns and cities in the Manabí province.	Use field research to describe the performance of a sample of 347 microentrepreneurs from three cantons in the Manabí province.

As could be seen, the studies, detailed in the table above, use a descriptive methodology, in some cases of a qualitative nature and in others of a cross-sectional quantitative nature based on univariate analysis of financial ratios, using information from companies obliged to keep accounting and accounting. That report their financial statements to the relevant regulatory entity.

In the other line of research mentioned, several authors have focused their attention on the determination of variables that explain the profitability of companies. In the same way, the objective, the methodology, and the results of some research studies are presented in Table 2.

**Table 2. Explanatory studies of profitability**

Author	Objective and methodology	Results
Yazdanfar et al. (2013)	Examines the profitability life cycle of Swedish microenterprises. The methodology used to explore the direction and strength of the relationship between all the variables in the ANOVA and MANOVA models was Pearson's relationship coefficient.	The profitability of the company changes systematically throughout the stages of its life cycle. Profitability is high in the first stage of their life cycle and as they develop and age, it decreases. The size variable influences profitability and the sector to which they belong has a more pronounced effect on companies than the size and life cycle stages variables.
Rasiah et al. (2014)	They empirically examine the trend of small, medium and large companies when their generated profitability is high. The methodology used to explain the behavior of profitability is through a regression model	Growth significantly explains the profitability of both small and medium-sized companies but was not significant in large companies.
Castillo-Valero y García-Cortijo (2013)	Identifies the explanatory variables that determine the profitability of the Castilla-La Mancha wine companies through an econometric model made up of performance variables, defined with the principal components technique.	The profitability of wine companies comes from: (a) their corporate structure, (b) their size, (c) financial structure
Ghosh y Guha (2015)	It determines the factors that affect the profitability of microenterprises in the slums of Mumbai through a generalized ordered logistic regression.	The age of the entrepreneur, the geographical location, the family structure of the entrepreneur, and the motivation to start the business are the main variables that determine the level of profitability of microenterprises.

Author	Objective and methodology	Results
Aulová et al. (2019)	It addresses the analysis of profitability indicators of agricultural companies in the Czech Republic through the DuPont analysis. The methodology used in this study is a correlation analysis	There are significant differences in the impact of both the economic profitability and financial profitability ratios between the individual groups of agricultural companies owned by legal entities.

From the results of the main explanatory works on business profitability, we gathered that both the financial indicators and the size variable have received special attention from researchers (Zambrano-Farías et al., 2018).

As a contribution to future research carried out in Ecuador, this work aims to initiate the study of financial profitability through comparisons of certain indicators that are important for the development of the company. Two groups of microenterprises have been considered: those that belong to the Guayas province and those that reside in the other provinces of the country. Therefore, the following hypotheses are proposed:

*H1: On average, the financial profitability of micro-enterprises in the Guayas province is lower than the financial profitability of micro-enterprises in the provinces of the rest of Ecuador.*

*H2: The average level of indebtedness of microenterprises in the Guayas province is higher than that of microenterprises in the provinces of the rest of Ecuador.*

*H3: The short-term solvency of microenterprises in the province of Guayas is greater than that of microenterprises in the provinces of the rest of Ecuador.*

## 2. Materials and method

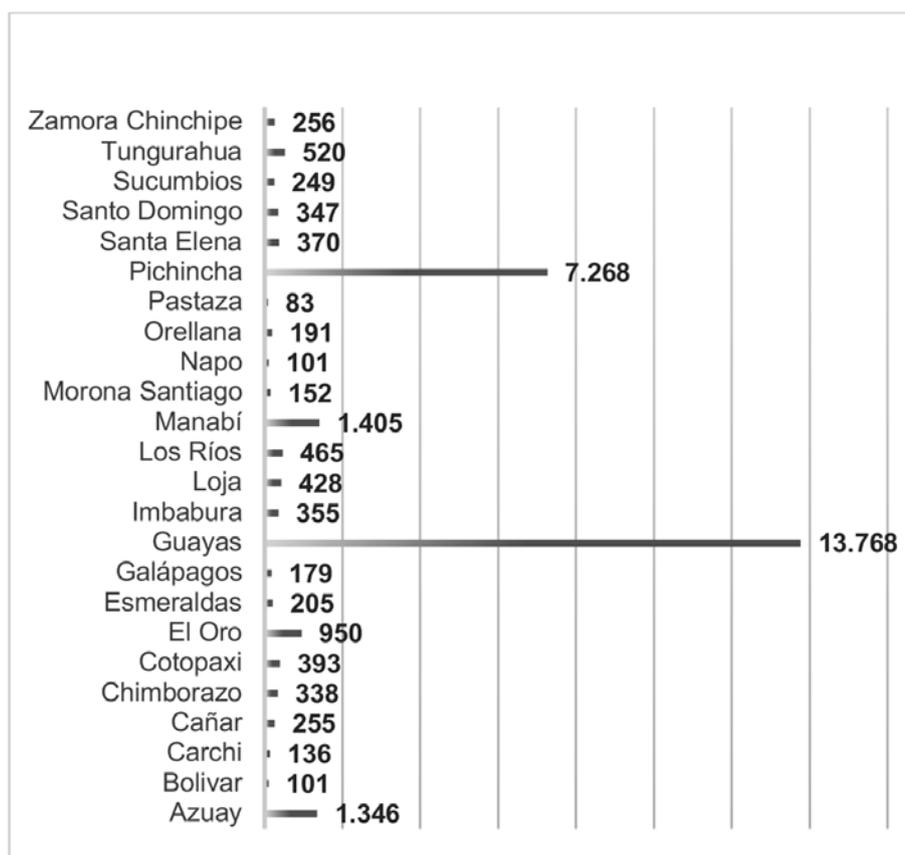
The methodology that supports this research is quantitative of a descriptive nature of cross-sectional design whose purpose is to analyze and compare the financial indicators of profitability, indebtedness, and liquidity of the microenterprises of the Guayas province with the microenterprises of the rest of the provinces of Ecuador.

### *Sample selection*

For the selection of the microenterprises that make up the sample under study, the following process has been carried out: (i) As of 2019, the number of active companies that registered their operations in the Superintendency of Companies, Securities and Insurance (SCVS) was 67,660 at the national level, of which only microenterprises were taken into account for this study. Their selection was in accordance with the criterion: the amount of total income being less or equal to USD100 thousand dollars, (ii) companies whose equity is greater than USD800 dollars were chosen, and (iii) those whose status is reported as active to the SCVS.

A sample of 29,861 active companies nationwide was drawn. Figure 1 shows the distribution of microenterprises by province, it can be seen that the province of Guayas has the largest number of companies with 13,768, which represents 46.11 %. In the second place, is the province of Pichincha with 7,268 companies which represents 24.34 %, followed by Manabí with 1405 companies, and Azuay with 1346 companies which represent 4.71 % and 4.51 % respectively.

**Figure 1. Distribution of micro-enterprises by province**



Source: Superintendency of Companies, Securities and Insurance (2020).

An important aspect to highlight is the number of microenterprises according to their constitution. Table 3 details the types of companies both in the province of Guayas and in the rest of the provinces of Ecuador. In the province of Guayas, there are 12,766 public limited companies while in the rest of the country there are 10,125 companies of this type. It is important to note that there are 5,964 corporation-type companies on rustic properties in the rest of the provinces of Ecuador, while in the province of Guayas there are only three companies of this type. This is due to the fact that most microenterprises in the other provinces register their homes in non-urban areas.

**Table 3. Microenterprises according to their constitution**

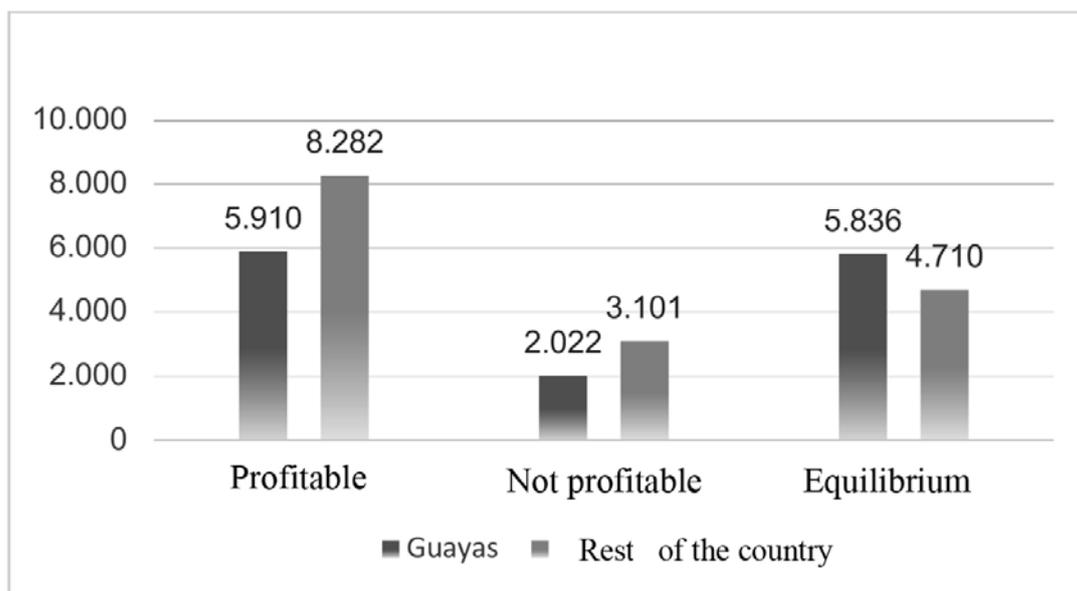
Company type	Guayas	Rest of the country
Limited company	12 766	10 125
Limited liability	994	1
Consortium	5	3
Limited company in rustic properties	3	5964
Total	13 768	16 093

Source: Superintendency of Companies, Securities and Insurance (2020).

Figure 2 shows the classification of microenterprises according to the results of their performance. Of the total sample of microenterprises in the Guayas province, 42.93 % of the companies are profitable, that is, 5,910 companies. The number of com-

panies with negative profitability (losses) is 2022 companies which represent 14.69 % of the sample, while companies that did not generate profit represent 42.39 %. In the rest of the Ecuadorian provinces, 51.46 % of the companies presented profits, 29.26 % presented losses and 19.26 % did not generate profit.

**Figure 2. Microenterprises according to their results**



Source: Superintendency of Companies, Securities and Insurance (2020).

Table 4 details the sector to which the microenterprises selected in the sample belong. In the province of Guayas, 61.83 % of the companies are concentrated in sectors A, G, L, and M, while in the provinces of Ecuador, 72.16 % of microenterprises are concentrated in sectors F, G, H, M and N.

**Table 4. Distribution of microenterprises according to economic sector**

Sector	Activity	Guayas	Rest of the country
A	Agriculture, forestry and fishing	1035	634
B	Mining and quarrying	67	207
C	Manufacturing industries	767	735
D	Electricity, gas, steam and air conditioning supplies	63	103
E	Water distribution; sewerage, waste management and sanitation activities	75	67
F	Construction	942	1610
G	Wholesale and retail trade; repair of vehicles, automobiles and motorcycles	3052	2246
H	Transport and storage	950	4,275
I	Accommodation and food service activities	200	226
J	Information and communication	522	832
K	Financial and insurance activities	394	389

Sector	Activity	Guayas	Rest of the country
L	Real estate activities	2549	618
M	Professional, scientific and technical activities	1877	2019
N	Administrative and support service activities	722	1,462
O	Public administration and defense; compulsory social security plans	3	1
P	Teaching	168	242
Q	Human health care and social assistance activities	207	235
R	Arts, entertainment and recreation	91	61
S	Other service activities	83	70
U	Activities of extraterritorial organizations and bodies	1	1
	Total	13 768	16 093

Source: Superintendency of Companies, Securities and Insurance (2020).

## 2.1. Variables

*Profitability.* In frequent investigations, the explained variable is the financial profitability that results from the quotient between the net profit margin and the equity. This ratio indicates the capacity of the shareholders' investment to generate profitability in the company.

*Liquidity.* Considered as a short-term solvency indicator. In general, it is a variable that directly affects the generation of profitability, it results from the quotient between current assets and current liabilities, it measures the ability of the company to pay its obligations (liabilities) in the short term.

*Indebtedness.* By means of this leverage ratio, the aim is to analyze the relative importance of financing through debt, showing what is the percentage of assets that microenterprises have financed through third parties.

## 2.2. Estimation method

For this study, a quantitative methodology was used. To test the hypotheses, the financial profitability, indebtedness, and liquidity were compared using a t-test for two independent samples with unequal variance. Specifically, the behavior of these financial ratios of microenterprises in the Guayas province has been compared with their counterparts in the rest of the country. The program used for this study was STATA.

## 3. Results

In order to observe the behavior of each of the financial ratios a descriptive analysis of the most representative univariate statistical measures was carried out for this research. Table 5 details the following information: On average, the financial profitability of the Guayas province is 15.60 % while the average financial profitability of the rest of the country is 29.60 %. It can be seen that for both groups the median value is zero, which indicates that half of the microenterprises in both the Guayas province and the rest of the country's provinces are negative. The asymmetry coefficient for both groups is negative, which indicates that the distribution of profitable companies is above the

average. Additionally, the distributions of both groups have a leptokurtic behavior, being higher in the Guayas province, which allows concluding that the profitability of microenterprises has a higher concentration around the average.

With regard to indebtedness, it can be seen that the province of Guayas has a higher average indebtedness, that is, 32.2 % finance their assets through debt, while the assets of microenterprises in the rest of the country's provinces 30.9 % have external financing. Fifty percent of the companies in the province of Guayas have their assets financed above 11.1 % through debt, while companies in the rest of the country's provinces have 13.0 %. The distribution of indebtedness, for both groups, has a positive bias, which indicates that the indebtedness of microenterprises is lower than the average, and given that their kurtosis coefficient is negative, it is concluded that both groups have a low concentration of data around the average.

Finally, the average current liquidity of microenterprises in the Guayas province is relatively higher than that of companies in the rest of the country's provinces, that is, for every dollar of debt. Despite this, 50 % of companies in the province of Guayas barely have USD 0.34 to pay off a dollar of debt in the short term, while microenterprises in the rest of the country have USD 1.11.

**Table 5. Descriptive analysis of the variables**

Statistical	Profitability		Indebtedness		Current liquidity	
	Guayas	Rest of the country	Guayas	Rest of the country	Guayas	Rest of the country
Mean	0.156	0.296	0.322	0.309	152.665	151.553
Median	0	0	0.111	0.130	0.342	1.11268
Kurtosis	2834.51	796.21	-1.203	-1.079	12699.49	5434.85
Asymmetry coefficient	-41.174	-14.190	0.668	0.704	110.72	70.05

As stated in the methodology, to test hypothesis 1 of this research, which indicates whether the average financial profitability of micro-enterprises in the Guayas province is greater than the financial profitability of microenterprises in the rest of the country, a test of comparison of means, whose results are shown in Table 6, was performed.

**Table 6. Comparison of Guayas profitability versus the rest of Ecuador profitability**

Variable	Observations	Mean	Interval of Confidence 95 %		T statistic	p-value
Profitability Guayas	13 768	0.156	0.054	0.258	-2.147	0.015
Profitability Rest of the country	16 093	0.296	0.218	0.375		

With a 95 % confidence level, it can be concluded that the financial profitability of the microenterprises in the Guayas province is not significantly higher than the financial profitability of the microenterprises in the rest of the country.

The results of the comparison of average indebtedness between the microenterprises of the Guayas province with respect to those of the rest of Ecuador are presented in Table 7.

**Table 7. Comparison of Guayas indebtedness versus indebtedness in the rest of Ecuador**

Variable	Observations	Mean	Interval of Confidence 95 %		T statistic	p-value
Indebtedness Guayas	13 768	0.156	0.054	0.258	-2.147	0.015
Indebtedness Rest of the Country	16 093	0.296	0.218	0.375		

With a 95 % confidence level, it can be concluded that the average indebtedness of the Guayas province is greater than the average indebtedness of the microenterprises of the provinces of the rest of Ecuador.

Regarding the short-term solvency of microenterprises, the results in Table 8. conclude that, on average, microenterprises in the Guayas province have greater liquidity than microenterprises in the rest of Ecuador.

**Table 8. Comparison of Guayas liquidity versus rest of Ecuador liquidity**

Variable	Observations	Mean	Interval of Confidence 95 %		T statistic	p-value
Liquidity Guayas	13 768	152.66	24.87	280.45	0.013	0.494
Liquidity Rest of the Country	16 093	151.55	56.80	246.30		

#### 4. Conclusions and discussion

This research has explored the behavior of three financial indicators that are considered key for the analysis of the profitability of microenterprises. A comparative study has been carried out of the financial profitability, indebtedness, and current liquidity between the microenterprises of the Guayas province and the microenterprises of the rest of the provinces of Ecuador. Despite the fact that, as of 2019, the largest number of microenterprises are located in the Guayas province, it is not possible to conclude that they have better financial indicators than the microenterprises in the provinces of the rest of the country. The average profitability of microenterprises in the province of Guayas is lower than that of microenterprises in the provinces of the rest of Ecuador, but it must also be considered that there are more companies that develop in the mining and quarrying sector in the rest the provinces of Ecuador and that, on average, the amount of their assets exceeds USD 7 million, which could significantly benefit these companies.

The average indebtedness of microenterprises in the province of Guayas is two percentage points higher than companies in the rest of Ecuador, this indicates that there is homogeneity in terms of the criteria for financing at the national level. It is also

important to note that microenterprises in the Guayas province have a greater capacity to pay their obligations in the short term. Descriptive analysis indicates that 50 % of these companies have less than \$ 0.34 to answer to their creditors in the short term. On the other hand, in the rest of the Ecuadorian provinces, 50 % of microenterprises have more capacity to pay in the short term.

The main contribution of the research is the delimitation of the data to the micro-enterprise segment since most of the studies focus on micro, small and medium-sized enterprises (defined as MSMEs) or small and medium-sized enterprises (defined as SMEs) as a single set, which makes it possible to highlight the importance of this type of organization in terms of its contribution to the Ecuadorian economy. Another contribution highlighted by this research aims to contribute to the development of lines of work that contribute to the development and design of policies that help the survival and business performance of microenterprises.

It is recommended to deepen this analysis for each province of the country, in such a way that the level of regional development can be determined and that it contributes to taking measures to promote equity between the regions.

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