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Microcredit as an Economic and Social Development Tool for Microenterprises

[1]Jose Gerardo Vaca Lombana, [2]Jairo Jamith Palacios Rozo, [3]Lugo Manuel Barbosa Guerrero

[1]Master's in Digital Marketing and E-commerce – Universidad Internacional de la Rioja Adjunct Professor at Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia. Email: jvaca@unicolmayor.edu.co.

ORCID: https://orcid.org/0009-0005-3669-933X

[2]PhD Candidate in Socioformation and Knowledge Society – CIFE. Master's in Education. Full-time Professor at Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia. Email: jjpalacios@unicolmayor.edu.co

ORCID: https://orcid.org/0000-0002-1437-9838

[3]PhD Candidate in Administration – Universidad La Salle. Master's in Educational Informatics. Full-time Professor at Universidad Colegio Mayor de Cundinamarca. Bogotá, Colombia. Email: lmbarbosa@unicolmayor.edu.co

ORCID: https://orcid.org/0000-0002-0871-8637

Abstract: Currently, there are advances in microfinance, but there is a need to create a system that adopts and develops tools to combat poverty or a lack of knowledge on how to promote economic development in vulnerable communities. The purpose of the study was the use of microcredit in the economy for financial decision making. (168) micro-entrepreneurs from the cities of Amatitán, Guadalajara and Tequila in Mexico participated. Secondary information taken from the research center for entrepreneurship and social development. –Funciedes-. They provided the survey "Microcredit in Microentrepreneurs in Mexico"; as a result of the hypothesis, the microentrepreneur, according to his main activity and his academic unit, has always lived in the municipality. In the analysis performed of the Bayesian binomial test which is based on the proportions compared and the shape of the prior distribution under the alternative hypothesis specified by Beta (1,1). Where the results give as evidence that the first -NO- with (38) has a proportion of (0.226) with a BF_{10} of (2.964e+10), and the second answer –YES- with (130) have a proportion of (0.774) with a BF_{10} of (2.964E+10), it is concluded that in the evidence provided by the Bayesian factor where the first response is in extreme favor of the alternative hypothesis where the second response is in favor of the alternative hypothesis.

Keywords: *microfinance, microcredit, microenterprises, economic development.*

Introduction

Microfinance has its ancient origins in the agricultural credit cooperatives created in Europe at the end of the 19th century. The system was adopted, adapted and then developed as a promising tool to combat poverty and foster economic development in vulnerable communities. Its origin dates back to the 1970s with the pioneering initiative of Muhammad Yunus in Bangladesh, who granted small loans to groups of women to boost their productive activities. Yunus conceived the idea of providing small loans to groups of women without the need for traditional collateral. Microfinance focuses on monetary

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problems and solutions for low-income people with limited income and expenses. These tools help to improve the performance of money and obtain better financial results over time (Montero Reyes et al., 2023). Access to financial services is crucial for economic development. Latin America has intensified efforts to improve this access, focusing on low-income individuals and households, as well as small businesses (Saiden, 2009). Microcredit programs have a positive impact on the financial well-being and human development of entrepreneurs in developing countries (Chliova, 2015). Grameen Bank's success inspired the creation of similar institutions around the world, and its positive impact on the lives of millions of people worldwide has cemented its position as a key instrument for combating poverty, promoting financial inclusion and empowering the most vulnerable communities. Microcredit is aimed at poor and excluded people who, despite their economic limitations, are able to take on and repay loans. This approach recognizes their skills and needs, offering financial opportunities not available in traditional credit (Garayalde et al., 2014). Microcredit, which is part of microfinance, being considered a financial innovation, tends to expand and improve the efficiency of the financial system, in fact, it reduces the gap in the financial deepening of the economy (Londoño-Bedoya et al., 2022). The global expansion of microcredit in recent decades suggests that it has established itself as an effective tool to provide access to financial resources to the poorest, thus improving their socioeconomic situation (Cairó i Céspedes and Gómez González, 2015).

According to the annual report of the Microfinance Observatory, “microcredit is above all a tool for economic and social development, enabling people with limited resources and a personal project to benefit from loans that the traditional banking system denies them”. The microcredit activity generally consists of granting small loans to entrepreneurs, traders, shopkeepers or artisans who cannot access traditional bank loans. Microfinance programs hold promise for alleviating poverty and spreading financial services (Morduch, 1999), additionally, microfinance includes other financial tools such as microsavings, a deposit service that allows an individual to save small amounts of money for future use to meet unforeseen expenses or plan future investments, but also microinsurance, a system whereby an individual makes a payment to share the risk.

This allows the entrepreneur to focus on growing their business while mitigating risks that affect poverty, health or the ability to work. The limited availability of adequate financing forces microenterprises to depend on their own resources and suppliers, highlighting the importance of microcredit as a key tool for their economic and social development (Aristizábal Velásquez, 2007). The objective of microcredit is to promote an open financial sector that supports the full participation of low-income segments of the population and promotes economic growth. Microfinance institutions, although they have high recovery rates, are affected by high transaction costs and lack of interest from investors seeking to maximize their profits; an innovative approach is needed to overcome these challenges (Cull, 2008). Before granting any financing product to the productive unit, financial institutions apply a credit study with the available information, using statistical models to evaluate the risks. However, in the absence of historical data such as financial statements, account performance, financing for the business is effectively excluded from this method of evaluation. Financial institutions are then induced to seek a level of contribution commensurate with the loan request and guarantees, but if the entrepreneur is in a precarious situation and has no assets, financing will be denied; to circumvent these difficulties, microcredits are created (Newman, 2017). Credit scoring and behavioral techniques effectively predict financial risk in lending decisions, with potential for further development in

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estimating consumer earnings and incorporating economic conditions (Bauchet et al., 2011). In order to apply the granting methodology, a concept known as microcredit technology has been determined, which consists of a table of analysis and decision, which is framed in a matrix that allows the financing decision to be made by means of this simple crossing of information, the following criteria are found:

1) Stability, which allows to identify the time of trajectory of the productive unit, the time of family coexistence, the time of renting its premises or place of residence, among others; the concept of individual responsibility for debt is fundamental to understanding credit risk behavior (Grablowsky & Brewer, 1975), in general, this item allows to know the seniority, both in the place of development of the business activity and in the place of residence; the longer the period of time, the better this attribute will be taken into account in the award decision.

2) Entrepreneurial ability which are personal skills such as creativity, proactivity, risk aversion, and internal sense of control influence entrepreneurial intentions through the mediating effects of self-efficacy and attitude toward entrepreneurship (Rosique-Blasco et al., 2018); these elements occupy a central position: the ease of communication, the history behind the business idea, the trajectory, the way in which a space has been opened in the entrepreneurial ecosystem, communication, the management of emotions, the capacity for teamwork, among others, are essential criteria for the granting of the financing product by the credit issuing entity.

3) Reputation where this criterion conceives the relationships created in the environment by the potential borrower, determines whether it is known by the population, how has been its interaction and its sense of collaboration, both from its neighbors, suppliers, tenants and its competitors with whom it shares market, which is a behavioral credit rating model can help assess the creditworthiness of those who do not have sufficient financial information (Liberati & Camillo, 2018).

4) Payment behavior where this criterion aims to minimize credit risk and expand knowledge about the modeling process (Khanza & Krisnawati, 2021), evaluation elements are incorporated to assess the payment behavior of the potential microcredit holder, validation of invoices with suppliers, rigor in the management of the family budget, verification of payments of public receipts, validation of receipts for payment of rent or cancellation of other credits with previous financial institutions.

While it is true that financial systems worldwide have methods of validating payment behavior with formally reported transactions, timeliness is not recorded in any aspect (Djeundje et al., 2021). Local development and microfinance are fundamental tools to meet the socioeconomic needs of individuals and therefore both realities are conceived as tools for empowering endogenous capacities (Mballa, 2017). Microcredits are tools that arise to provide financial support and enhance the development specifically of the microenterprise segment (Tauro et al., 2020).

Parallel to this assessment of the trust that can be placed in the borrower, known in the industry as “character analysis”, a more traditional analysis of needs and repayment capacity is carried out. This last step is intended to identify the destination of the value of the financing and determine, according to the cash flow of the business unit, a regular installment payable during the necessary periods of time and repay the entity the amount borrowed with the corresponding interest.

Methodology

The sampling applied was non-probabilistic, it was arranged by the conditions of availability and access to the microentrepreneurs, this sampling technique allows the researcher to select the samples based

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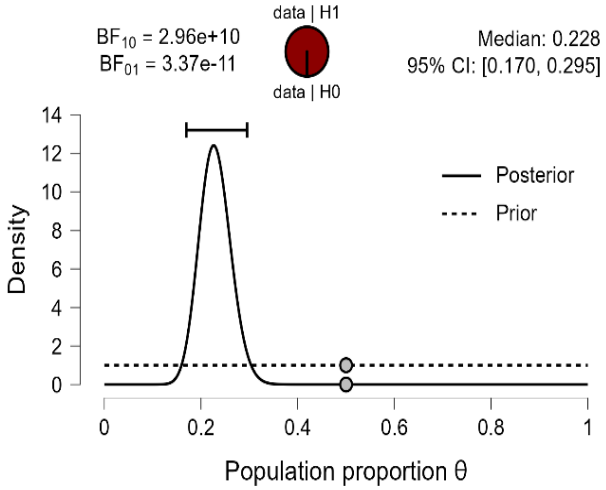
on subjective judgment and this technique allows the observation of the opinion and habits in an effective way. The microentrepreneurs completed the survey "The microcredit tools to combat poverty of microenterprises", from the evidence of the results by the project use of microcredit in the economy for financial decision making. In the interpretation of the hypothesis, the microentrepreneur, according to his main activity and his academic unit, has always lived in the municipality.

Results

The project involved 168 microentrepreneurs of legal age with the main activity of being traders and the economic unit of marketing of luxury goods, marketing of basic necessities, marketing of machinery, technology, tools, miscellaneous, provision of services, production of raw materials and transformation of raw materials to intermediates belonging to the cities of Amatitán, Guadalajara and Tequila in the country of Mexico. They completed the survey "Microcredit in Microentrepreneurs in Mexico". The analysis of the survey was carried out using Bayesian statistics where its pillar is the subjective probability where reasoning is based on additional evidence based on previous acquired knowledge. Next, the hypothesis is interpreted to the microentrepreneur according to his main activity and his academic unit has always lived in the municipality. This is contrasted with the a priori probability. The following is an analysis of the density plot produced in JASP statistical software, which is a representation of the posterior distribution and the a priori distribution of microentrepreneurs. The (x) axis shows the proportion of the population which is between 0 and 1, where the (y) axis illustrates the relative probability density. Subsequently, the inference graph with respect to the question: has the microentrepreneur, according to his main activity and academic unit, always lived in the municipality? According to the answer, the analysis of the density graph and sequential analysis graph is carried out.

Figure 1.

Density graph -priori and posterior. V.406 – NO



Note: The density plot represents the posterior distribution of the proportion of the population surveyed with JASP statistical software (Version 0.16.3) [Computer software].

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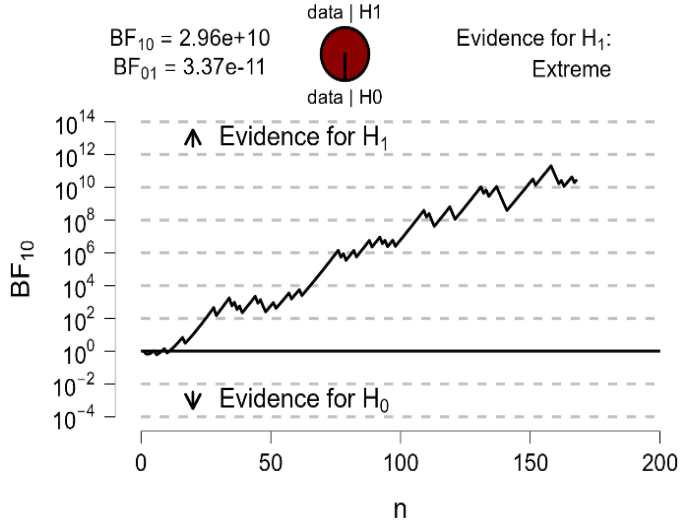
Figure 2.

Sequential analysis graph V.406 – NO



Note. The sequential analysis graph, interpreted according to the evidence to be moderate, anecdotal or Extreme for H0 or H1 with the statistical software JASP (Version 0.16.3) [Computer software].

When considering the a priori neutral beliefs where the median of the posterior distribution is obtained which is centered around (0.228), as the updated probability of (95%) in favor of a differential effect between treatments and against (0.5%) in favor of being equal. Where the credibility interval (CI) is 95%, it has a variation between [0.170, 0.295]. It then indicates that with a (95%) credibility the proportion of the surveyed population of microentrepreneurs is between 0.170 and 0.295. With respect to the Bayes factor, 1) With a (BF10 = 2.96e+10) for the alternative hypothesis (H1) over the null hypothesis (H0), a (BF10 less than 1) suggests that the data are more compatible with (H0) than with (H1), for case a (BF_{10}=2.96e+10) indicates that the data provide more support for the null model (H1) than for the alternative model (H0), strongly; 2) A (BF01 greater than 1) suggests that the data are more supportive of (H0) than (H1). Which means that for this case, a BF01 = 3.37e-11 means that the data are approximately (3.37) times more likely to be in favor of H1 than in favor of H0. Next in the sequential analysis and according to the table of quantifiable interpretation values of the Bayes factor, with a (BF10 = 2.96e+10), is between the values (10^0 to 10^{11}) the evidence is considered to be Extreme the case indicates that the data strongly favor (H1) over (H0) and with a (BF01 = 3.37e-11), it is confirmed that there is more extreme support for H1 than for H0.

Regarding the question: has the microentrepreneur, according to his main activity and academic unit, always lived in the municipality? in the second alternative answer 'Yes'. The data summarized in the density table and sequential analysis represent.

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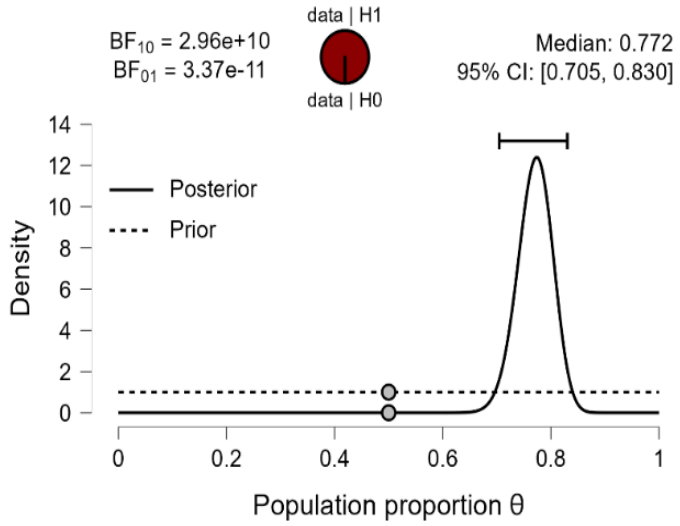
Figure 3.

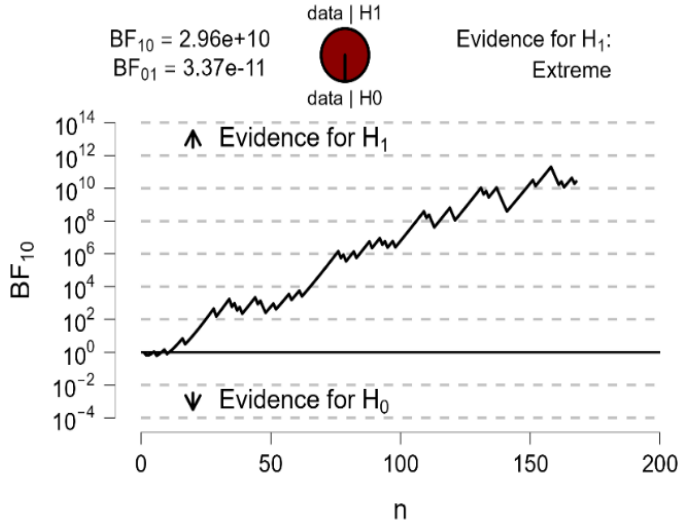
Density graph -priori and posterior V.406 – YES



Note: The density plot represents the posterior distribution of the proportion of the population surveyed with JASP statistical software (Version 0.16.3) [Computer software].

Figure 4.

Sequential analysis chart V.406 – YES



Note. The sequential analysis graph, interpreted according to the evidence to be moderate, anecdotal or strong for H0 or H1 with JASP statistical software (Version 0.16.3) [Computer software].

Next, a priori neutral beliefs are considered where the median of the posterior distribution is obtained which is centered around (0.772), as the updated probability of (95%) in favor of a differential effect between treatments and against (0.5%) in favor of being equal. Where the 95% credibility interval (CI) has a range between [0.705, 0.830]. Then it indicates that with a (95%) credibility the

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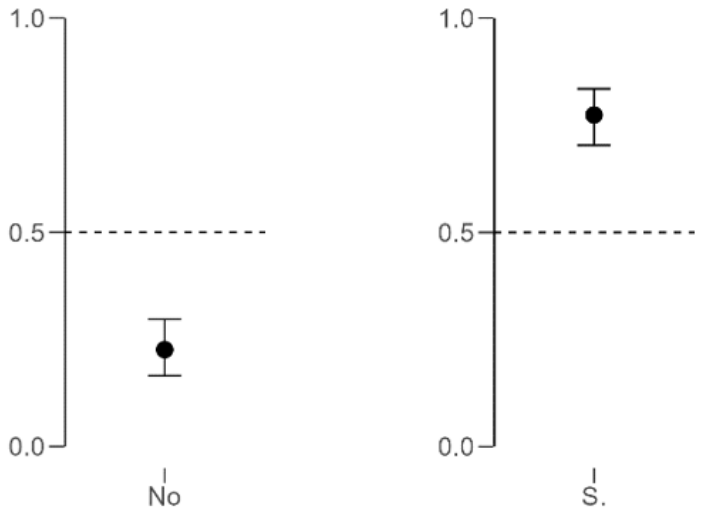
proportion of the surveyed population of microentrepreneurs is between 0.705 and 0.830. With respect to the Bayes factor, 1) With a (BF10 = 2.96e+10) for the alternative hypothesis (H1) over the null hypothesis (H0), a (BF10 less than 1) suggests that the data are more compatible with (H0) than with (H1), for the case a (BF_{10}=2.96e+10) indicates that the data provide support for the null model (H1) than for the alternative model (H0), strongly; 2) A (BF01 greater than 1) suggests that the data support (H0) more than (H1). Which means that for this case, with a BF01 = 3.37e-11 means that the data are approximately (3.37) times more likely in favor of H1 than in favor of H0. Next in the sequential analysis and according to the table of quantifiable interpretation values of the Bayes factor, with a (BF10 = 2.96e+10), is between the values (10^0 a 10^{11}) the evidence is considered to be Extreme the case indicates that the data strongly favor (H1) over (H0) and with a (BF01 = 3.37e-11), it is confirmed that there is more extreme support for H1 than for H0.

Below is the descriptive graph of the question: has the microentrepreneur, according to his main activity and academic unit, always lived in the municipality? with the response of the microentrepreneurs, which graphically shows the percentage distribution of the responses.

Figure 5.
Descriptive graph of perception on the question: has the microentrepreneur, according to his main activity and academic unit, always lived in the municipality?



Note: Descriptive graph with JASP statistical software (Version 0.16.3) [Computer software].

This descriptive graph shows the percentage distribution of the answers given by the microentrepreneurs. This survey was applied to 168 microentrepreneurs from the cities of Amatitán, Guadalajara and Tequila in Mexico. They completed the survey "Microcredit in Microentrepreneurs in Mexico". They provided their perception through the question: has the microentrepreneur, according to his main activity and academic unit, always lived in the municipality? with the following distribution: 1) With the answer No (38) microentrepreneurs, which represents a proportion of (0.226); 2) With the

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answer Yes (130) microentrepreneurs, which represents a proportion of (0.774). Where a proportion which is compared with a value of zero point zero to zero point five is evident.

Conclusion

In considering the application of Bayesian hypothesis testing as an intuitive tool for statistical inference. In response to the question: has the microentrepreneur, according to his/her main activity and academic unit, always lived in the municipality?. Where microentrepreneurs answered the survey "Microcredit tools to combat poverty of microenterprises", from the evidence of the results by the project use of microcredit in the economy for financial decision making. The role that microcredit has played in the access to financing for households and companies, the natural persons who accessed credit for the first time in that year did so through microcredits, evidencing the impact of this credit modality as a tool for access to productive financing. When considering the a priori neutral beliefs where the median of the posterior distribution is obtained which is centered around the mean as the updated probability in favor of a differential effect between treatments and against one in favor of being equal the credible interval the data provide more support for the alternative model than for the null model strongly.

The data are approximately more likely to be in favor of the alternative hypothesis than in favor of the null hypothesis, next in the sequential analysis and according to the table of quantifiable interpretation values of the Bayes factor, the evidence is considered to be Extreme the case indicates that the data strongly favor Extreme, it is confirmed that there is more extreme support for the alternative hypothesis than for the null hypothesis concluding that in the evidence provided by the Bayesian factor where the first answer in extreme favor of the alternative hypothesis where the second answer in favor of the alternative hypothesis.

When applying Bayesian hypothesis testing to answer the question of whether microentrepreneurs have always lived in the municipality where they carry out their activity, we found strong evidence in favor of the alternative hypothesis. This suggests that the microentrepreneurs surveyed, for the most part, are long-time residents of the municipality. This conclusion is reinforced when considering the key role that microcredit has played in providing access to financing for these individuals and their businesses. As the first source of credit for many, microcredit has democratized access to productive financing, especially in regions where traditional options are limited. The results of the Bayesian analysis by strongly supporting the alternative hypothesis, indicate that there is a high probability that the microentrepreneurs surveyed have established deep roots in their communities, which in turn reinforces the importance of microcredit as a tool for local development and employment generation.

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