**Remittances Review**
June, 2023
Volume: 8, No: 4, pp. 1494-1507
ISSN: 2059-6588 (Print) | ISSN 2059-6596 (Online)
remittancesreview.com

Received: 11 November 2022 Accepted: 15 March, 2023
DOI: https://doi.org/10.33182/rr.v8i4.104

# Analysis of placement and delinquency rates in agricultural sector bank financing: Case of the Bolívar Provincial Branch of BanEcuador B.P.

Juan Carlos Bravo Gaibor[1],García Lopez Nelson Javier MBA[2], Edgar Marcelo Vilcacundo Chamorro[3], Arguello Delgado Verónica del Carmen, MsC[4].

***Abstract***

*During the COVID-19 pandemic, bank financing directed towards the agricultural and livestock sector in Ecuador has experienced significant changes. Although there has been a notable increase in financing, details regarding the current scope and conditions of these specialized loans are not available. The volatility and dependence on external factors in the agricultural sector pose a challenge when obtaining loans. Portfolio delinquency is the most important indicator in the management of credit institutions. Our study conducted at BanEcuador B.P (Guaranda - Ecuador) adopts a mixed approach, and the information was obtained from institutional sources and validated surveys. The data reveals an increase in delinquency rates, with a percentage that rose from 0.79% at the end of 2018 to 11.40% in April 2023. Additionally, there are irregular spikes in placement amounts. It is concluded that credit conditions and various internal and external factors significantly contribute to the increase in delinquency rates in the microfinance area of BanEcuador B.P. in the Bolívar province.*

***Keywords:*** *Delinquency, Microcredits, Agricultural, Internal and External Factors, Bolívar Province*

## Introduction

In the Financial System, both public and private entities offer a variety of products and services as part of their portfolio. Among the most well-known are commercial loans, microcredits, and consumer loans, which are widely accepted and sought after by those who wish to carry out various projects and obtain working capital (Quinde et al., 2018). For this research, agricultural microcredits granted in the Bolívar Province since 2018 will be taken as reference.

A microcredit, according to the definition by (Sepúlveda Rivillas et al., 2012), is a small loan granted

[1] Programa de Maestría en Administración de Empresas. Dirección de Posgrado y Educación Contínua. Universidad Estatal de Bolívar http://orcid.org/0009-0008-2206-8969 juanbravo824@hotmail.com
[2] Programa de Maestría en Administración de Empresas. Dirección de Posgrado y Educación Contínua. Universidad Estatal de Bolívar https://orcid.org/0000-0002-6226-4453 jgarcia@ueb.edu.ec
[3] Programa de Maestría en Administración de Empresas. Dirección de Posgrado y Educación Contínua. Universidad Estatal de Bolívar https://orcid.org/0000-0003-1575-8976 mvilcacundo@ueb.edu.ec
[4] Programa de Maestría en Administración de Empresas. Dirección de Posgrado y Educación Contínua. Universidad Estatal de Bolívar https://orcid.org/0000-0002-9158-6830 varguello@ueb.edu.ec

to individuals with low resources for income-generating self-employment projects, in which financial guarantees are replaced by training measures, leading to high credit risk.

On the other hand, the Banking Superintendency (Special Commission for Risk Asset Classification and Reporting to the Banking and Insurance Superintendency) defines microcredit as a loan granted to an individual or legal entity, or a group of borrowers with joint liability, aimed at financing small-scale production, commercialization, or service activities. The main source of repayment for this type of credit comes from sales or income generated by such activities, which are duly verified by the financial institution acting as the lender.

Regarding the diversity of microcredit, according to the current Monetary and Financial Organic Code in Ecuador (CÓDIGO ORGÁNICO MONETARIO Y FINANCIERO - Of. No. SAN-2014-1305), it is classified into three types: retail, simple accumulation, and expanded accumulation.

(Uquillas & González, 2017) Delinquency in the loan portfolio is the most important indicator in the management of credit institutions. This research focuses on analyzing the delinquency and placement rates of the loan portfolio granted at the Bolívar Provincial Branch of BanEcuador B.P. in the Bolívar Province, during the period from 2018 to April 2023. The analysis of delinquency rates in the agricultural sector of the province and its increase is a matter of vital importance today. As this sector plays a crucial role in the country's economic development and the Central Sierra region, access to financing is essential for producers to invest in crops and improve their productivity.

(Sophie Ávila & -Foucat in the year 2017) state that there are various challenges regarding access to bank financing for the agricultural sector, such as the lack of collateral and the scarcity of reliable credit information to reduce delinquency risks. Despite this landscape, the country has implemented initiatives aimed at promoting bank financing in the agricultural sector, such as the introduction of new credit guarantee programs and the promotion of financial education among producers.

According to the document titled El Crédito Productivo y Su Incidencia En La Producción Agrícola Del Ecuador (published by Lenin Chagerben - Noemí Moreno - Werner Chagerben in the year 2019), it is essential to analyze the current situation of the loan portfolio granted to the agricultural sector in the Bolívar Province, as well as explore the opportunities and challenges that arise in this field. Therefore, the importance of bank financing in the agricultural and livestock sector is addressed, placement amounts and delinquency rates are analyzed, the main challenges and opportunities in this field are explored, and some of the initiatives implemented in the region to promote access to bank financing in the agricultural sector of the province are examined. (Manabí & Oro)

The delinquency rate indicator refers to the percentage of the total unproductive portfolio in relation to the total gross portfolio. This indicator represents the risk associated with payment delays. Payment delays generate default interest. In this article, an analysis of the delinquency risk

index in simple microcredit payments in financial institutions was conducted (Banco Central del Ecuador 2023). It was concluded that delinquency is a risk present in the financial system and that an increase in the delinquency rate is a signal of a possible financial crisis. Therefore, it is necessary to evaluate this index rigorously, as a significant increase in delinquency can cause profitability and liquidity problems, and even result in losses and deficits in provisions. In this sense, a credit union that experiences a deterioration in its loan portfolio may see its profitability affected by the increase in the proportion of loans with unpaid interest (Loor-Zambrano, 2022).

In the Bolívar Province, there is a moderately developed microfinance market with a growing demand for loans. This segment is of great importance to the country's economic activity and, in particular, to the province. Small and medium-scale enterprises constitute the driving force behind the current economic dynamics and represent a significant percentage of the economic units generating employment in the local economy.

This situation, which is related to a series of favorable economic policies (Sophie Ávila-Foucat, 2017), has created a conducive environment for the growth of the microfinance business. However, the boom in this type of credit poses a challenge for credit providers, as the increase in the number of clients represents a challenge in such a competitive market (Tamayo et al., 2019). Therefore, it is common for good clients to receive multiple financing options from public and private banking entities that compete with each other to place their funds. In this context, Ayaviri & Romero (2021) mention that the delinquency rate in the microfinance market has been increasing. In fact, both the magnitude of the delinquent portfolio and the high-risk portfolio (which includes delinquent and refinanced loans) have experienced respective increases (Sanhueza, 2019).

(SUBMANAGEMENT OF PROGRAMMING AND REGULATION NATIONAL DIRECTORATE OF SYSTEMIC RISK, MONITORING OF THE MAIN MONETARY AND FINANCIAL INDICATORS OF THE ECUADORIAN ECONOMY Content, 2018) For this reason, financial institutions, facing the challenge of expanding their portfolios without compromising the profitability of the business, prioritize the search for mechanisms that minimize the possibility of clients defaulting. One of the most relevant issues faced by BanEcuador in the Bolívar Province is the delinquency rate in agricultural microcredits. After these credits have been disbursed, the institution, in the face of the possibility of payment default by the debtor, makes a specific provision based on the category and number of days of delay in said credit. In some cases, the risks of non-payment originate from inadequate credit assessment, the conditions under which the credit is granted, and a lack of interest in credit management, ultimately resulting in a delinquency rate that is much higher than allowed by the bank. On the other hand, the credit evaluation policies implemented by the institution can also be an important factor in the possibility of clients failing to meet their obligations. A lack of experience has been observed among advisors in assessing different industries and types of businesses, as well as a considerable risk propensity from the commercial area in accepting very high risks at a low interest rate and making inappropriate debt purchases. These elements can contribute to clients failing to meet their

financial obligations. (Cevallos-Mendoza & Campos-Vera, 2023)

In the case of BanEcuador B.P. Bolívar, specifically in the microfinance area, it faces a significant threat due to the increase in the delinquency rate in the bank's portfolio. This increase has had a notable impact on recent periods' income, as reflected in the bank's income statement. A decrease in profits, growth in provisions, high operating costs, and a decrease in liquidity have been observed. The objective of this research is to conduct a comprehensive analysis of the increase in the levels of placement of agricultural credits and the variations in the overdue portfolio, as well as the delinquency rate, in the different offices that make up the Bolívar Provincial Branch of BanEcuador B.P. The primary purpose of this study is to identify and determine the internal and external factors that are significantly influencing these indicators, aiming to provide an accurate and complete understanding of the factors that shape and impact these critical indicators for the banking entity.

## Methodology

The methodology applied in this article combines quantitative, qualitative, and descriptive approaches. Data analysis was conducted using data obtained from the credit department of BanEcuador B.P. in the Bolívar Provincial Branch, covering periods from 2018 to April 2023. Descriptive statistics were used to identify the main components of the loan portfolio and the levels of delinquency. The delinquency rate (DELQ) was calculated, and a correlation test was conducted between placed credit operations and overdue credit operations. Surveys were conducted using a representative sample and applied on a Likert scale. Documentary references such as the Credit Concession Process Manual, General Credit Regulations, and current Collection Manuals were reviewed. A systematic review of existing literature was conducted using a qualitative approach, describing and comparing factors related to the central theme of the study using Boolean term searches. The results were presented through statistical graphs and percentage values in Microsoft Excel 2017.

**Table 1** Applied Search Methodology.

| **Sección** | **Ítem** |
|---|---|
| Eligibility Criteria | Inclusion and Exclusion Criteria |
| Sources of Information | Scielo, Dialnet, Scopus, and Google Scholar |
| Search Strings | (Banking financing and agricultural sector and Ecuador)<br>(Banking financing or agricultural sector and Ecuador)<br>(Loans and agricultural sector and Ecuador) |
| Selection Process | Duplicate documents will be eliminated. Abstracts of selected studies will be read. Data from studies that meet the selection criteria will be obtained by reading the full text of each article. |
| Data Collection Process | The Scimago platform will be used to collect data from journals |
| Synthesis Methods | Results from the studies will be organized into tables to improve their comprehension. These tables will display specific data that will help demonstrate |

the relevance of the presented information in a clear and simple manner.

**Note:** Characteristics and Criteria for Bibliographic Information Search.

**Source:** Own elaboration based on the searches criterial.

## Results and Discussion

After analyzing the obtained data, the first result identified is that the placement amounts of microloans in BanEcuador B.P. Bolívar Branch have been irregular during the periods corresponding to 2018, 2019, 2020, 2021, 2022, and April 2023. A higher peak in placement amounts is observed in 2020, followed by another peak in 2019. These placement amounts mainly focus on the major segments of the agricultural and livestock sectors. As of April 30, 2023, BanEcuador B.P. has a total outstanding portfolio of $27,907,073.26, distributed among a total of 7,320 granted credit operations. Additionally, a total amount of $4,978,001.08 is recorded in the overdue portfolio, distributed among 1,340 operations.

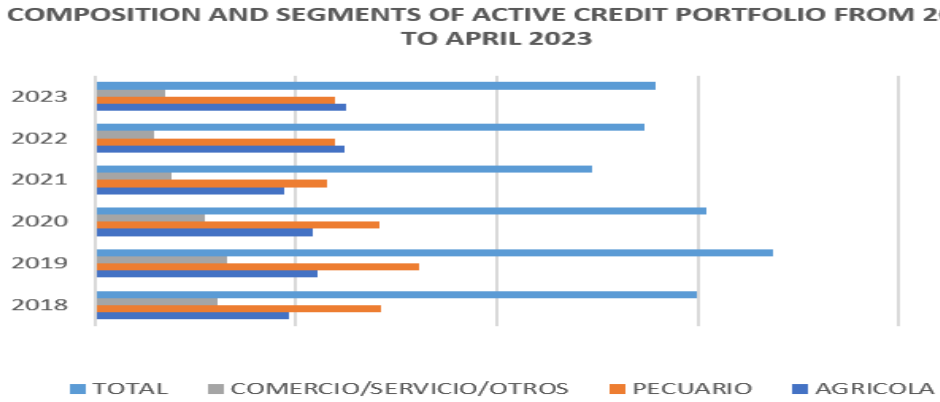


**Figure 1** Composition of Active Portfolio in Provincial Bolívar Branch of BanEcuador B.P.

**Note:** The highest peaks in credit placement are evident in the years 2019 and 2020**.**

**Source:** Own elaboration based on data obtained from BanEcuador Bolívar.

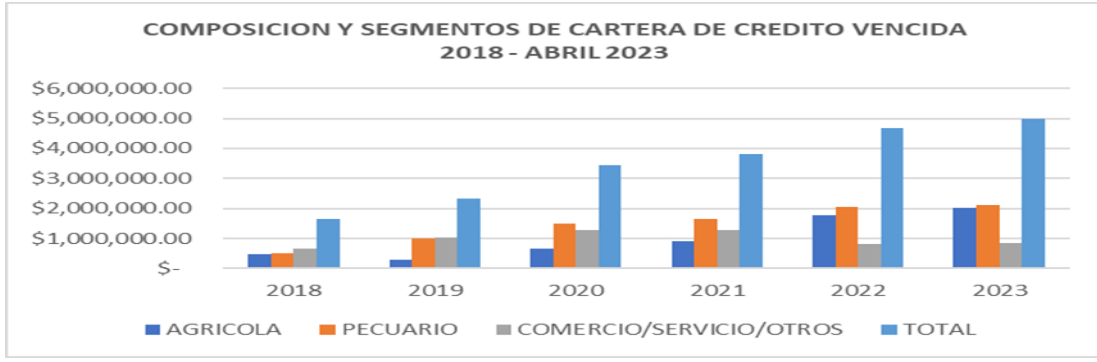

**Figure 2** Composition of Delinquent Portfolio in Bolívar Province, BanEcuador B.P.

**Note:** The highest peaks of delinquent portfolio are observed in the year 2023.

**Source:** Own elaboration based on data obtained from BanEcuador Bolívar.

The performance of bank financing in the agricultural sector has been a topic of interest and debate in Ecuador, especially during the pandemic. According to Macías et al. (2022), an increase in bank financing targeted at the agricultural sector has been observed during the COVID-19 crisis (Figure 1). This could be a response to the needs of farmers who have been affected by the health situation and the demand from consumers to acquire food products. On the other hand, studies conducted by Lara et al. (2021) and Coello & Medina (2019) indicate that the levels of financing to the agricultural sector by private credit institutions exceed those of public banks by more than 70%. However, it is also highlighted that public banks have granted a greater number of microloans compared to the private sector. This difference may reflect the financing policies and approaches adopted by each type of institution. BanEcuador B.P. has a total amount of $27,907,073.26 in loans granted for agricultural and commercial purposes.

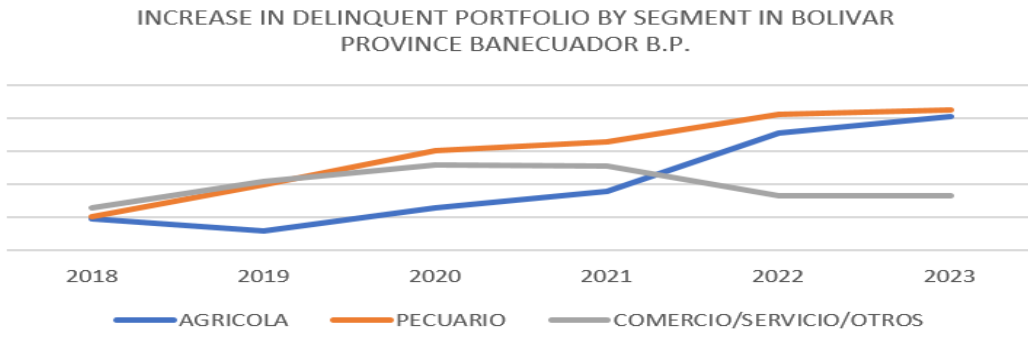


**Figure 3** Increase in Delinquent Portfolio by Segment in Bolivar Province, BanEcuador B.

**Note:** The growth of the overdue portfolio by concession segments and year in Bolívar Province is shown.

**Source:** Own elaboration based on data obtained from BanEcuador Bolívar

**Table 2** Amount of Non-performing Portfolio and Delinquency Rate by Office and by Year.

| Non-Performing Portfolio | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|
| ECHEANDIA | $ 54,132.42 | $ 96,842.09 | $ 66,963.28 | $ 160,650.51 | $ 237,269.05 | $ 303,982.61 |
| SAN MIGUEL | $ 11,822.43 | $ 104,964.01 | $ 94,213.11 | $ 257,501.97 | $ 234,436.14 | $ 327,674.14 |
| GUARANDA | $ 225,799.04 | $ 576,768.80 | $ 767,742.77 | $ 973,156.05 | $ 1,011,777.3 | $ 1,241,871.6 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | 1 | 9 |
| CALUMA | $ 6,052.27 | $ 22,526.07 | $ 34,875.40 | $ 60,923.33 | $ 108,341.89 | $ 137,483.58 |
| LAS NAVES | $ 30,924.52 | $ 23,683.54 | $ 36,487.73 | $ 273,696.72 | $ 606,224.05 | $ 891,825.86 |
| CHILLANES | $ 6,533.33 | $ 20,625.19 | $ 101,251.77 | $ 330,339.43 | $ 512,126.37 | $ 540,880.91 |
| Provincial Total | $ 335,264.01 | $ 845,409.70 | $ 1,101,534.06 | $ 2,056,268.01 | $ 2,710,174.81 | $ 3,443,718.79 |
| Delinquency Rate | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| ECHEANDIA | 0.93% | 1.45% | 1.24% | 3.26% | 4.51% | 5.79% |
| SAN MIGUEL | 0.37% | 3.15% | 2.92% | 8.35% | 8.00% | 11.10% |
| GUARANDA | 2.29% | 5.47% | 8.50% | 11.46% | 13.65% | 15.71% |
| CALUMA | 0.23% | 0.73% | 1.27% | 2.50% | 4.73% | 5.76% |
| LAS NAVES | 0.74% | 0.45% | 0.72% | 5.34% | 11.93% | 17.73% |
| CHILLANES | 0.15% | 0.42% | 2.03% | 49.65% | 11.77% | 12.33% |
| Provincial Total | 0.79% | 1.94% | 2.78% | 13.43% | 9.10% | 11.40% |

**Note:** Impaired Portfolio Amount and Delinquency Ratio by Office for the Provincial Branch, calculated using the IMOR method. **Source:** Self-made based on data obtained from BanEcuador Bolívar.

Haro (2021) argues that the agricultural sector faces significant inequality in accessing formal credit from banks. Only a small percentage of participants in this activity receive financing, which can limit the growth and development of the sector. This inequality may be related to various factors, such as lack of collateral or restrictive financial requirements. Ayaviri & Romero (2021) point out that the agricultural sector is considered one of the riskiest for investment recovery, especially when working with external capital. This could explain the resistance of some financial institutions to grant loans to the agricultural sector. The volatile and externally dependent nature of agriculture can generate uncertainty and risk for lenders and financial institutions, and the increase in the delinquent portfolio in the provincial branch of BanEcuador B.P. is evidence of this condition, reaching a total amount of $4,978,001.08 (Figure 2). The deficiencies in cooperative strategies to ensure loan repayment, as highlighted by Tamayo et al. (2019), emphasize the importance of establishing efficient monitoring and support mechanisms for borrowers, as well as strengthening financial management capacities in the agricultural sector. Pinda's proposal (2022) to maintain jobs in the agricultural sector and support agricultural SMEs highlights the relevance of generating specific policies and measures that promote job creation and sustainable development in the sector,

while reducing credit risk and the increase in delinquency indicators caused by internal and external factors (Table 2). However, Chuncho et al. (2020) find that agricultural production can be sustained without the presence of agricultural productive credit, raising questions about the effectiveness of this tool in public policies for the sustained growth of the sector. This raises the question of whether agricultural credit is truly necessary or if there are other ways to support agricultural development. Regarding banks, the authors mention that private banks invest more in the agricultural sector than public banks. This disparity raises questions about resource distribution and the efficiency of public banks in providing adequate financial support to the agricultural sector.

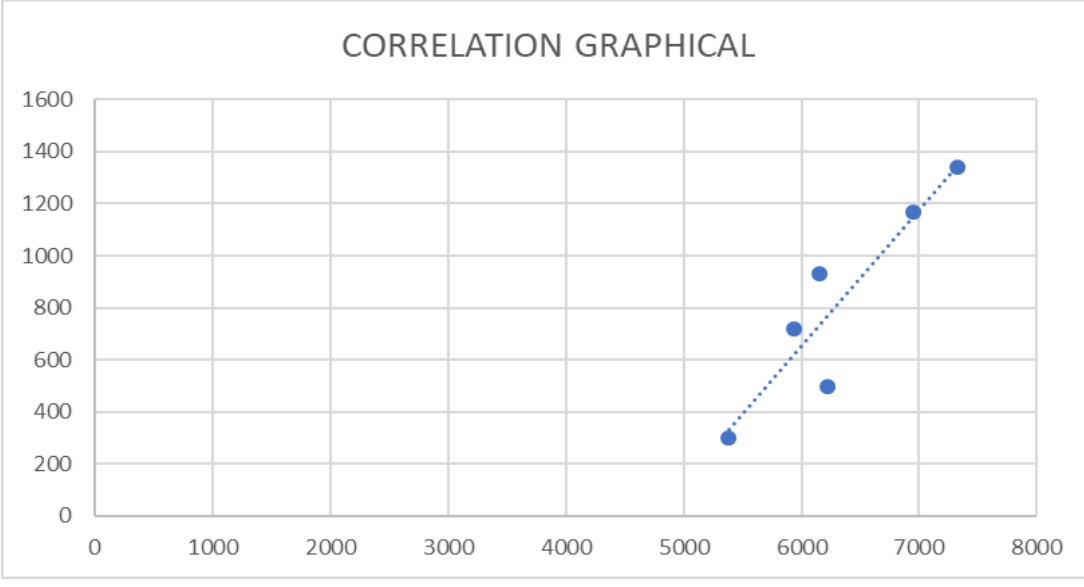


**Figure 4** Correlation Test.

Note: The coefficient of correlation (r) indicates a strong positive relationship between the number of disbursed operations and the number of defaulted operations in the Provincial branch of BanEcuador Bolívar. With a value of 0.91, it suggests a high degree of correlation, meaning that as the number of disbursed operations increases, there is a strong tendency for the number of defaulted operations to increase as well.

The coefficient of determination (r^2) of 0.84 indicates that approximately 84% of the variation in the number of defaulted operations can be explained by the variation in the number of disbursed operations. This suggests that the number of disbursed operations is a good predictor of the number of defaulted operations in the Provincial branch.

Overall, these results indicate a significant relationship between the two variables, suggesting that the number of operations disbursed has a strong influence on the number of operations that become defaulted in the Provincial branch of BanEcuador Bolívar.

Furthermore, issues such as the mismatch between financing time and harvest time are mentioned, highlighted by Ayaviri & Romero (2021). This lack of synchronization can create difficulties for farmers as they cannot obtain financing at the right time to carry out their productive activities. Pinargote & Avilés (2020) highlight the insufficiency and inefficiency of investment policies towards the agricultural sector compared to neighboring countries such as Peru and Colombia. This comparison emphasizes the importance of improving agricultural financing policies to drive sector development and achieve regional competitiveness. Regarding agricultural SMEs, Delgado & Chávez (2018) point out that they face difficulties in accessing financing due to high collateral requirements and other criteria set by banks. This limits their ability to obtain the necessary resources for their development and growth. In contrast, Huilca & Baño (2021) highlight that the government has offered fiscal incentives to financial institutions that provide credit to the agricultural sector. These measures aim to increase productivity and promote growth in the agricultural sector. Vera & Bravo (2022) emphasize the crucial role of public development banking, such as BanEcuador, in promoting the agricultural sector and financial inclusion of marginalized rural and urban populations. This highlights the importance of having specialized financial institutions that understand the needs of the agricultural sector and provide services tailored to its characteristics.

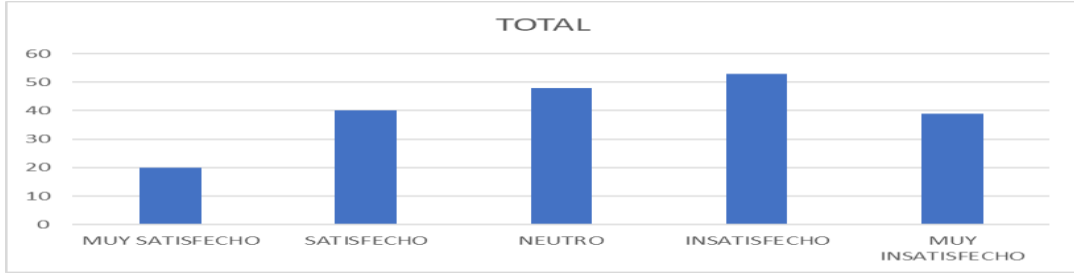


**Figure 5** BanEcuador B.P Internal User Satisfaction Survey.

Note: The survey results of the sample mean, measured using the Likert scale methodology, were tabulated in Microsoft Excel 2017. The obtained coefficient of Cronbach's alpha was 0.7019. The survey was conducted among employees involved in credit granting within the BanEcuador Bolívar Provincial branch.

Source: Self-generated from data obtained from BanEcuador Bolívar.

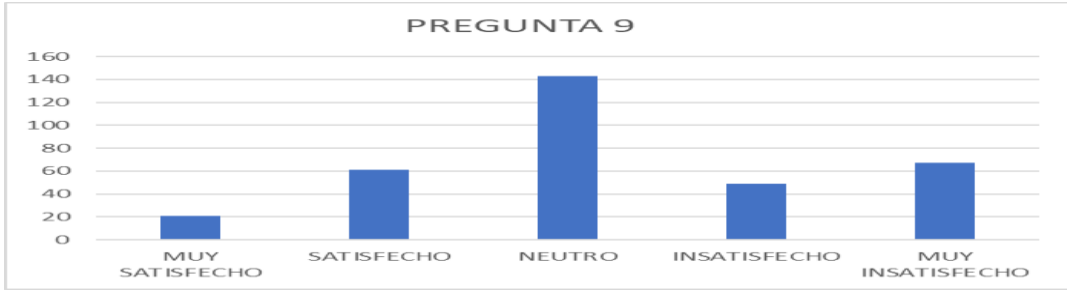


**Figure 6** Survey of External User Satisfaction BanEcuador B.P

**Note:** Result of surveys from a sample mean using Likert scale-based measurement methodology and tabulated in Microsoft Excel 2017, with a corresponding Cronbach's coefficient of 0.7153, of customers with overdue operations comprising the credit portfolio of BanEcuador Bolívar's Provincial branch.

Source: Self-generated from data obtained from BanEcuador Bolívar

Intriago et al. (2020) mention that small and medium-sized agricultural enterprises face challenges in obtaining financing due to their informal nature and other factors that limit their ability to meet the requirements of financial institutions. This situation highlights the need to develop more flexible financing mechanisms adapted to the characteristics of agricultural SMEs. The issue of the contributions of bank financing to the agricultural sector is of great relevance, as access to credit can have a significant impact on sector productivity and development. By analyzing the contributions mentioned by different authors, several key points can be identified. Macías et al. (2022) emphasize the fundamental role of bank financing in providing credit access to farmers, enabling them to invest in their operations and improve productivity. This implies that farmers can acquire inputs, equipment, and other necessary resources for their operations, which is crucial for sector growth.

## Conclusion

After analyzing the performance of bank financing in the agricultural and livestock sector, several relevant ideas can be highlighted. First, it is observed that during the COVID-19 pandemic, bank financing in the agricultural sector in Ecuador increased, possibly in response to the needs of farmers affected by the health crisis. However, detailed information about the extent and conditions of these specialized loans is not provided.

Regarding the contributions of bank financing to the agricultural sector, several significant aspects are identified. Studies reveal that private credit institutions exceed the financing levels of public banks by more than 70%. However, public banks have granted more microloans than the private sector, reflecting different financing approaches adopted by each type of institution. However, a significant inequality in access to formal credit by farmers is evident, which can limit the growth

and development of the sector. This inequality may be related to factors such as a lack of collateral or restrictive financial requirements.

Furthermore, it is highlighted that the agricultural sector is considered the riskiest for investment recovery, especially when working with external capital. This volatile and externally dependent characteristic of agriculture may explain the reluctance of some financial institutions to provide loans to the agricultural sector.

Regarding bank financing policies for the agricultural sector, it is important to promote alternative sources of financing and foster coordination between the public and private sectors. It is necessary to develop more flexible financing mechanisms adapted to the specific needs of small and medium-sized agricultural enterprises. Additionally, the importance of establishing credit rates and efficient technical management in credit issuance is emphasized, with the aim of ensuring equitable access and sustainable growth of the agricultural sector.

The performance of bank financing in the agricultural sector faces challenges and presents opportunities. Although an increase in financing has been observed during the pandemic, inequalities in access to credit and limitations in financing policies persist. Therefore, it is essential to implement measures that promote equitable access, simplify credit application processes, and develop specific policies that drive sustainable growth and development of the agricultural sector.

Regarding the delinquency rate, it is evident that it is closely related to the lack of proper execution of protocols for granting loans, resulting in ineffectiveness. Therefore, it is suggested to design policies and strategies for control and improvement of these processes. It is also important to consider the impact of the credit policies specific to financial institutions, as excessive flexibility can lead to a disproportionate increase in loan placements, which can directly impact the delinquency rate.

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