

GROWTH OF SAVINGS AND CREDIT COOPERATIVES IN THE PROVINCE OF EL ORO (2015–2023)

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Recebido: 16.06.2025

Aceito: 18.11.2025

Publicado: 15.01.2026

How to cite: Rico Santana, J., León García, F., Dávila Herrera, J. (2026). Growth of savings and credit cooperatives in the province of El Oro (2015–2023). *Sapientiae*, 11(2), e110209. www.doi.org/10.37293/sapientiae112.09

ABSTRACT

This study aims to analyze the growth of savings and credit cooperatives in the province of El Oro during the period 2015–2023 and their influence on the provincial Gross Domestic Product (GDP). A quantitative approach with a descriptive and correlational scope was used, applying a multiple regression model with variables standardized through Z-score. The variables considered were the number of active cooperatives, the number of members, and the annual profits of the cooperative sector. The results show that, despite the reduction in the number of operating cooperatives, the sustained growth in profits and membership base reflects a process of institutional consolidation. Statistical analysis revealed that profits have a positive and significant impact on GDP, while the number of active cooperatives and members shows a negative relationship, suggesting that numerical growth in the sector does not necessarily lead to greater economic contribution unless accompanied by sound financial management. It is concluded that profitability and operational efficiency are key factors for the cooperative sector to effectively influence local economic development. Furthermore, it highlights the need to guide public policies toward strengthening those cooperatives that demonstrate the capacity to generate economic and social value.

Keywords: Credit Unions, Popular and Solidarity Economy, Economic Growth, El Oro Province, Provincial PIB, Demographic Growth.

Crescimento das Cooperativas de Poupança e Crédito na Província de El Oro (2015–2023)

RESUMO

O presente estudo tem como objetivo analisar o crescimento das cooperativas de poupança e crédito na província de El Oro durante o período de 2015–2023 e sua influência no Produto Interno Bruto (PIB) provincial. Foi adotada uma abordagem quantitativa, de caráter descritivo e correlacional, aplicando-se um modelo de regressão múltipla com variáveis padronizadas por meio do Z-score. As variáveis consideradas foram o número de cooperativas ativas, o número de associados e os lucros anuais do setor cooperativo. Os resultados indicam que, apesar da redução no número de cooperativas em operação, o crescimento sustentado dos lucros e da base de associados reflete um processo de consolidação institucional. A análise estatística revelou que os lucros exercem um impacto positivo e significativo sobre o PIB, enquanto o número de cooperativas ativas e de associados apresenta uma relação negativa, o que sugere que o crescimento numérico do setor não implica necessariamente maior contribuição econômica quando não é acompanhado por uma gestão financeira adequada. Conclui-se que a rentabilidade e a eficiência operacional são fatores-chave para que o setor cooperativo contribua de forma efetiva para o desenvolvimento econômico local. Destaca-se, ainda, a necessidade de orientar as políticas públicas para o fortalecimento das cooperativas que demonstrem capacidade de gerar valor econômico e social.

Palavras-chave: Cooperativas de Poupança e Crédito; Economia Popular e Solidária; Crescimento Econômico; Província de El Oro; PIB Provincial; Crescimento Demográfico.

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Crecimiento de las Cooperativas de Ahorro y Crédito en la Provincia de El Oro (2015–2023)

RESUMEN

El presente estudio tiene como objetivo analizar el crecimiento de las cooperativas de ahorro y crédito en la provincia de El Oro durante el período 2015–2023 y su influencia en el Producto Interno Bruto (PIB) provincial. Se utilizó un enfoque cuantitativo, de alcance descriptivo y correlacional, aplicando un modelo de regresión múltiple con variables estandarizadas mediante Z-score. Las variables consideradas fueron el número de cooperativas activas, el número de socios y las utilidades anuales del sector cooperativo. Los resultados muestran que, a pesar de la reducción en el número de cooperativas operativas, el crecimiento sostenido de las utilidades y de la base de socios refleja un proceso de consolidación institucional. El análisis estadístico reveló que las utilidades tienen un impacto positivo y significativo sobre el PIB, mientras que el número de cooperativas activas y de socios presenta una relación negativa, lo que sugiere que el crecimiento numérico del sector no necesariamente conlleva un mayor aporte económico si no se acompaña de una adecuada gestión financiera. Se concluye que la rentabilidad y eficiencia operativa son factores clave para que el sector cooperativo incida de manera efectiva en el desarrollo económico local. Asimismo, se resalta la necesidad de orientar las políticas públicas hacia el fortalecimiento de aquellas cooperativas que demuestren capacidad de generar valor económico y social.

Palabras Clave: Cooperativas de Ahorro y Crédito, Economía Popular y Solidaria, Crecimiento Económico, Provincia de El Oro, PIB Provincial, Crecimiento Demográfico.

Introduction

In the province of El Oro, savings and credit cooperatives have played a crucial role in the local economy, particularly within vulnerable sectors that require access to financial services (Luque González & Peñaherrera Melo, 2021). These organizations are fundamental pillars of the popular and solidarity economy system, driving financial inclusion and fostering territorial development. During the 2015–2023 period, the provincial Gross Domestic Product (GDP) has shown significant fluctuations, raising questions regarding the capacity of these institutions to adapt to economic shifts and contribute to the region's economic growth (Yaselga Alvarado, 2019).

Despite their importance, there is a lack of detailed studies analyzing the relationship between the growth of these cooperatives and provincial economic performance. In this context, the central problem of this research focuses on determining the growth trajectory of savings and credit cooperatives in the province of El Oro between 2015 and 2023 and its correlation with the provincial GDP.

In summary, this study seeks to analyze the growth of El Oro's savings and credit cooperatives and their impact on the provincial economy to identify their real contribution to local development and guide institutional strengthening strategies. This addresses the existing gap in literature, which has primarily focused on general evaluations of financial inclusion rather than the specific link between cooperative performance and provincial GDP.

The research questions guiding this study are: How is the annual growth rate of cooperatives linked to provincial GDP performance? and What is the relationship between the profits generated by cooperatives and the provincial GDP during the study period?

The general objective is to analyze the growth of savings and credit cooperatives in El Oro between 2015 and 2023, considering their annual growth rate, number of members, and profits, while evaluating their impact on local economic development in relation to the provincial GDP. The specific objectives are: i) to analyze the evolution of the annual growth rate of cooperatives in relation to provincial GDP performance; and ii) to examine the profits generated by these institutions and their impact on the provincial economy.

This study aims to contribute to the body of knowledge regarding the impact of savings and credit cooperatives on local economic development. In El Oro, these cooperatives serve as strategic actors for regional development through financial inclusion and credit access. This analysis will identify trends, strengths, and areas for improvement, providing valuable information for policymakers and future research within the field of the popular and solidarity economy.

Methodologically, the work is based on a quantitative, descriptive, and correlational approach, utilizing statistical data from official sources such as the Superintendence of the Popular and Solidarity Economy (SEPS) and the Central Bank of Ecuador (BCE). A multiple regression model with variables standardized via Z-score will be applied to evaluate the relationship between the number of members, annual growth rate, and profits with the provincial GDP.

THEORETICAL FRAMEWORK

Origin and Evolution of Savings and Credit Cooperatives in Ecuador

The growth of savings and credit cooperatives in Ecuador is rooted in historical practices linked to indigenous ancestral traditions, specifically the concept of *Sumak Kawsay* (Good Living), which prioritizes collective well-being. This approach gained theoretical consolidation during the 1980s, supported by scholars such as Saltos Cruz and

Mayorga Díaz (2016), who emphasized the significance of the popular economy in Latin America. In Ecuador, the development of these institutions accelerated after the year 2000, driven by the increasing demand for financial inclusion in rural and vulnerable areas.

From a regulatory perspective, the Constitution of the Republic of Ecuador (2008) formally recognized the Popular and Solidarity Economy (EPS) as a key sector for economic development. Subsequently, the Organic Law of Popular and Solidarity Economy (LOEPS, 2011) established a regulatory framework ensuring principles such as equity in the distribution of surpluses, respect for the social and environmental surroundings, and the preeminence of labor over capital. These regulations facilitated the strengthening of cooperatives as engines of development (Becerra Erráez, Guarnizo Púa, Campuzano Vásquez, & Dávila Herrera, 2021).

Various studies, such as those conducted by Carrera Tobar (2023), have highlighted the dual impact of these institutions: on one hand, their financial performance has enabled economic inclusion in traditionally marginalized sectors; on the other, their social impact has generated employment and provided access to credit in rural communities. National examples, such as successful cases in the provinces of Guayas and Azuay, demonstrate how cooperatives have promoted the development of Small and Medium-sized Enterprises (SMEs). Internationally, countries like Bolivia and Peru have experienced similar results through initiatives that strengthen rural economies and improve the quality of life for underprivileged populations.

In this context, savings and credit cooperatives have been fundamental to financial inclusion in rural areas of Ecuador, where traditional banking services are limited. These institutions have facilitated access to affordable credit, driving productive projects that strengthen food sovereignty, enhance savings capacity, and contribute to the development of local economies.

Popular and Solidarity Economy (EPS)

The Popular and Solidarity Economy (EPS) in Ecuador is defined as an alternative economic system that seeks to overcome economic exploitation by emphasizing the human being as "*homo solidarius*" rather than "*homo economicus*." This economic model is characterized by the inclusion of associative, community, and cooperative sectors, where capital is not prioritized; instead, focus is placed on people and collective ownership. The EPS promotes principles such as cooperation, solidarity, equity, internal and egalitarian democracy, as well as respect for nature and the valuation of ancestral knowledge (Villacres Arias et al., 2018).

Its primary objective is to improve the quality of life for the population, especially those in situations of vulnerability or limited resources. Thus, the EPS seeks to offer solutions to community needs through a non-profit approach based on cooperation in the production, distribution, and consumption of goods and services. The structure of this system emphasizes social and fraternal bonds, prioritizing community integration over capital accumulation (Gómez Ceballos et al., 2021).

In addition to its social focus, the EPS aims to limit the power of the traditional capitalist market, seeking to build markets with fair prices and more egalitarian production relations. The economic surplus generated by organizations within the EPS is not intended for capital accumulation; rather, it must be reinvested in social activities that benefit the community. This vision of a solidarity economy highlights the social character of the system, as it arises from society itself to satisfy the needs of its members while keeping their cultures and traditions alive (Guachamín et al., 2025).

Regarding the legal and regulatory framework governing savings and credit cooperatives in Ecuador, the 2008 Constitution recognizes the EPS as a plural manifestation across various economic activities, including finance, and establishes solidarity and cooperation as the constitutive values of this system. Article 30 of the Regime of Good Living (*Régimen del Buen Vivir*) underscores that the national system of social inclusion and equity aims to ensure constitutional rights and fulfill social development objectives. Within this framework, labor is considered a right, a social duty, and a source of personal fulfillment. Furthermore, the National Development Plan, known as the National Plan for Good Living, reaffirms the fundamental role of the EPS as an economic system designed to promote collective well-being and social inclusion. In this manner, the legal framework supports the integration of savings and credit cooperatives within the EPS, promoting their growth and ensuring their alignment with the principles of equity and social justice (Superintendencia de Economía Popular y Solidaria, 2011).

Savings and Credit Cooperatives

Savings and credit cooperatives are associative financial entities that, governed by cooperative principles, channel resources to satisfy the economic and social needs of their members. These organizations are guided by values such as democratic management, autonomy, and the equitable distribution of surpluses, operating with a dual focus that combines financial profitability with collective well-being. In Ecuador, these cooperatives are fundamental in

promoting financial inclusion within vulnerable sectors and strengthening community development (Gutiérrez García, 2009).

In this context, it is evident that cooperatives play not only a financial role but also a social one by generating cohesion and opportunities for communities underserved by traditional banking. Their participatory structure and capacity to adapt to local needs position them as key actors in the solidarity economy, especially in developing countries like Ecuador.

Savings and credit cooperatives play an essential role in the economic systems of developing nations, promoting access to credit, fostering savings, and contributing to "*Buen Vivir*" (Good Living). These organizations support territorial development by addressing both economic and social needs, driving productive projects, and strengthening solidarity networks. Furthermore, cooperatives contribute to sustainability by balancing economic objectives with collective welfare (Guerrero Burgos, 2020).

It is undeniable that cooperatives become engines of local development by offering solutions tailored to the realities of their communities. Their comprehensive approach, which transcends mere profitability, strengthens community bonds and fosters economic autonomy, making them strategic instruments for sustainable growth in contexts with structural limitations.

Endogenous Development as a Local Economic Development Approach

Endogenous development is defined as a process of structural socioeconomic change that seeks to drive self-sustained progress based on local capacities and resources. This approach places the territory as the central axis of development, in contrast to centralized models that often generate territorial inequalities. Influenced by the theories of authors such as J. Friedmann and Douglas North, it integrates economic, social, cultural, and environmental dimensions, promoting a balance between sustainability and growth. The active participation of communities and the strengthening of social capital are fundamental aspects of this model, which prioritizes cooperation, reciprocity, and innovation as pillars of local development (Alonso Alemán, 2006).

In coherence with these principles, endogenous development emphasizes the importance of creating innovative environments that boost production and human capital formation. Through the efficient use of local resources and decentralized decision-making, this approach allows for the articulation of strategies that promote both social equity and environmental sustainability. However, it recognizes the limitations faced by many local economies, especially in underdeveloped countries, where support from the central government becomes indispensable to complement local efforts and overcome structural barriers.

Access to financial services is presented as a key element within this approach, as it facilitates the mobilization of economic resources necessary for the development of productive and innovative projects. Institutions such as savings and credit cooperatives play an essential role, not only by offering accessible financing but also by building networks of trust and social cohesion that reinforce the sustainability of endogenous development. This, in turn, fosters financial inclusion in traditionally excluded sectors, allowing for more equitable and decentralized economic growth (Sinchi Yong, 2023).

Consequently, it is evident that endogenous development, complemented by effective access to financial services, not only favors the economic autonomy of local communities but also integrates multisectoral efforts to reduce inequalities and promote balanced development. In this way, this approach becomes an essential tool for facing the challenges of sustainable development in contexts of territorial and economic diversity.

Cooperative Growth

The growth of cooperatives, especially within the context of the Popular and Solidarity Economy (EPS) in Ecuador, is a central theme for understanding their impact on the local economy and their capacity to contribute to the well-being of the most vulnerable sectors. The financial sector of the EPS has experienced notable growth in recent years, as evidenced by several key indicators. By December 2018, the sector comprised 608 entities, 6,891,718 members, and assets valued at 14.011 billion dollars. This expansion has been particularly significant in Segment 1 cooperatives—those with assets exceeding 80 million dollars—which concentrate the majority of members and assets, including institutions such as *Juventud Ecuatoriana Progresista* and *Jardín Azuayo*. Between 2017 and 2018, the assets of the Popular and Solidarity Financial System (SFPS) grew by 15.20%, surpassing the growth of private banking, which stood at 5.20%. Furthermore, the equity of the SFPS also experienced higher growth than private banking during the same period, highlighting the strength and expansion of the cooperative sector in the country (Asobanca, 2023).

The concept of organizational growth applied to the financial cooperative sector can be understood as the expansion of an entity in terms of assets, liabilities, equity, and number of members, reflecting increased operational and economic capacity. This type of growth is measured not only in financial terms but also by the capacity to serve

rural and low-income sectors, thereby contributing to financial inclusion. Through this growth, EPS cooperatives have succeeded in increasing the supply of credit and financial services, especially for new ventures, consolidating their presence and relevance in the popular economy (Malla Alvarado, Pardo Quezada, Bejarano Copo, & Herrera Peña, 2021).

The primary factors driving a cooperative's growth are diverse and interconnected. In the first instance, the increase in membership plays an essential role. The number of members in EPS cooperatives has grown significantly, largely due to the trust the population has placed in these institutions, particularly in the aftermath of the 1999 banking crisis. This trust has allowed cooperatives to attract a larger member base and, consequently, increase their available resources and liquidity. Secondly, capital accumulation is a key factor for sustained growth. The volume of assets in cooperatives follows a consistent upward trend, which is attributable in part to the reinvestment of surpluses and the specific tax benefits granted to these entities. Capital accumulation not only reinforces the financial solidity of cooperatives but also provides the necessary leverage to finance new projects and expand their institutional operations. Finally, operational expansion has been fundamental to the growth of cooperatives, particularly through their specialized reach into rural areas and low-income sectors that remain underserved by the traditional commercial banking system (Morales Molina & Llamuca Pérez, 2021).

Methodology

This research is framed within a quantitative approach, as it is based on the statistical analysis of numerical data related to key economic variables (Nizama Valladolid & Nizama Chávez, 2020). The central objective is to measure the growth of savings and credit cooperatives in the province of El Oro and analyze their influence on the provincial Gross Domestic Product (GDP) during the 2015–2023 period.

The study is descriptive-correlational in nature. In its descriptive dimension, it characterizes variables such as annual profits, the number of active cooperatives, and the number of members (Morillo Guerrero, 2022). In its correlational dimension, it explores the relationship between these independent variables and the provincial GDP to evaluate their impact on local economic development (Viteri Barba, 2019).

The research follows a non-experimental and longitudinal design, as variables are not manipulated but observed as they appear in official records (Lakhemissi & Rebai, 2024). Data are analyzed over a nine-year period, allowing for the identification of trends and patterns over time (Botía Morillas & Jurado Guerrero, 2018).

The study population consists of all active savings and credit cooperatives in the province of El Oro during the 2015–2023 period. In this interval, the number of entities decreased from 15 in 2015 to 7 in 2023; the study considers the totality of available data without applying sampling. Provincial Gross Domestic Product (GDP) was employed as the dependent variable, while the independent variables included the annual profits of the cooperatives (in millions of dollars), the number of active cooperatives, and the total number of affiliated members. Data regarding the cooperatives were obtained from the Superintendence of the Popular and Solidarity Economy (SEPS, 2022), while the provincial GDP and profit series were sourced from the Central Bank of Ecuador (BCE, 2023).

The data were obtained from official secondary sources, primarily the Superintendence of the Popular and Solidarity Economy (SEPS, 2022) and the Central Bank of Ecuador (BCE, 2023), institutions that guarantee reliable and consistent information. To homogenize variables with different units of measurement, standardization was applied using the Z-score formula. This technique allows for the comparison of variables across distinct scales and facilitates interpretation within the multiple regression analysis. The formula used was:

$$Z = \frac{x - \mu}{\sigma}$$

Equation 1. Z-score formula for standardizing variables

Where Z is the standardized value, x is the original value, μ is the arithmetic mean, and σ is the standard deviation. The statistical analysis was conducted using the Stata software, which facilitated data organization, the generation of visualizations, and detailed interpretations (Ponce Renoca, 2023). Standardized coefficients, the R^2 value, statistical significance, and standard errors were evaluated to determine the impact of each independent variable on the provincial GDP.

Finally, the study adhered to the ethical and methodological principles of academic research. Only public data were employed, ensuring that the privacy and confidentiality of the cooperatives and their members remained uncompromised. The use of information was strictly limited to analytical and academic purposes.

Results

For the quantitative analysis, annual information corresponding to the 2015–2023 period was compiled, considering the following as primary variables: the Gross Domestic Product (GDP) of the province of El Oro, the profits generated by savings and credit cooperatives, the number of active cooperatives, and the total number of registered members. These data constitute the empirical basis of the study and allow for the observation of the evolution of cooperatives over time in relation to the provincial economy (Table 1). It is noted that the year 2024 is not included, as the study is expressly limited to the defined period from 2015 to 2023.

Table 1. Annual data on GDP, profits, number of cooperatives, and members in the province of El Oro (2015–2023)

Year	Provincial GDP (USD millions)	Profits (USD millions)	Number of Cooperatives	Number of Members
2015	3,293 M	1,466 M	15	3,507
2016	3,174 M	2,126 M	14	4,218
2017	3,467 M	2,516 M	13	4,630
2018	3,359 M	2,948 M	12	5,044
2019	3,383 M	2,849 M	10	4,956
2020	3,207 M	3,500 M	10	5,458
2021	3,602 M	4,378 M	10	6,075
2022	3,821 M	3,879 M	8	5,588
2023	4,011 M	3,959 M	7	5,626

Note: Superintendence of the Popular and Solidarity Economy - SEPS (2022) and Banco Central del Ecuador – BCE (2023)

It should be noted that, according to information recorded by the Superintendency of Popular and Solidarity Economy (SEPS), only seven active savings and credit cooperatives with significant operations in the province of El Oro were identified for the year 2023. These are:

1. *Cooperativa de Ahorro y Crédito Educadores de El Oro Ltda.*
2. *Cooperativa de Ahorro y Crédito Nuevos Horizontes El Oro Ltda.*
3. *Cooperativa de Ahorro y Crédito Luz de El Oro Ltda.*
4. *Cooperativa de Ahorro y Crédito Comerciantes de El Oro Ltda.*
5. *Cooperativa de Ahorro y Crédito Empleados Bancarios de El Oro Ltda.*
6. *Cooperativa Internacional Fronteriza Asociada (CIFA).*
7. *Cooperativa de Ahorro y Crédito Santa Rosa Ltda.*

This progressive reduction in the number of cooperatives does not necessarily reflect a decline in the sector; rather, it indicates institutional consolidation. In this process, several entities have been absorbed, merged, or liquidated, while others have centralized their accounting information at their headquarters, making provincial breakdowns more complex. For this study, the data were filtered to include only those cooperatives with direct operations and the greatest economic influence in the province of El Oro, thereby ensuring the relevance and representativeness of the territorial analysis.

Below are the descriptive statistics for the variables used in the analysis, including measures of central tendency and dispersion such as the mean, median, standard deviation, minimum, and maximum. This information provides insight into the general behavior and variability of each variable throughout the study period (see Table 2)

Table 2. Descriptive statistics for selected variables (2015–2023)

Variable	Mean	Median	Minimum	Maximum	Standard Deviation
GDP	3,480 M	3,383 M	3,174 M	4,011 M	283 M
Profits	3,069 M	2,948 M	1,466 M	4,378 M	947 M
Nº of Cooperatives	11	10	7	15	3
Nº of Members	5,011	5,044	3,507	6,075	797

The Gross Domestic Product (GDP) of the province of El Oro shows a fluctuating evolution during the 2015–2023 period. Following a decline between 2015 and 2016, the GDP experienced a gradual recovery starting in 2017, reaching its highest peak in 2023 at USD 4.011 billion. This trend evidences a progressive economic reactivation following the contraction experienced in 2020, which is attributable to the pandemic and other cyclical factors.

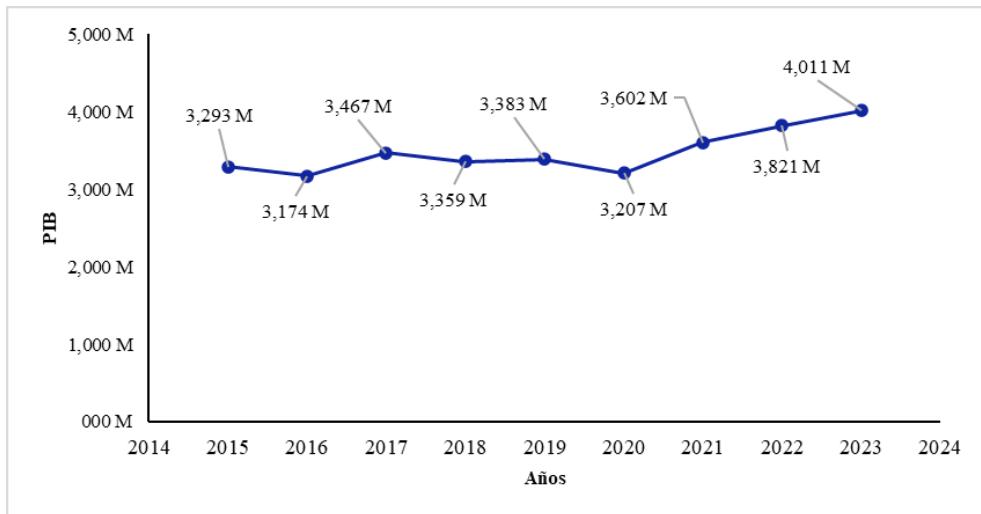


Figure 1. Evolution of El Oro's provincial GDP (2015–2023)

Note: Banco Central del Ecuador – BCE (2023)

The profits generated by savings and credit cooperatives exhibit a sustained growth trend throughout the analyzed period. From USD 1.466 billion in 2015, they increased significantly to reach USD 3.959 billion in 2023. This behavior reveals a consistent improvement in the profitability of the cooperative sector, despite fluctuations in the broader economic environment.

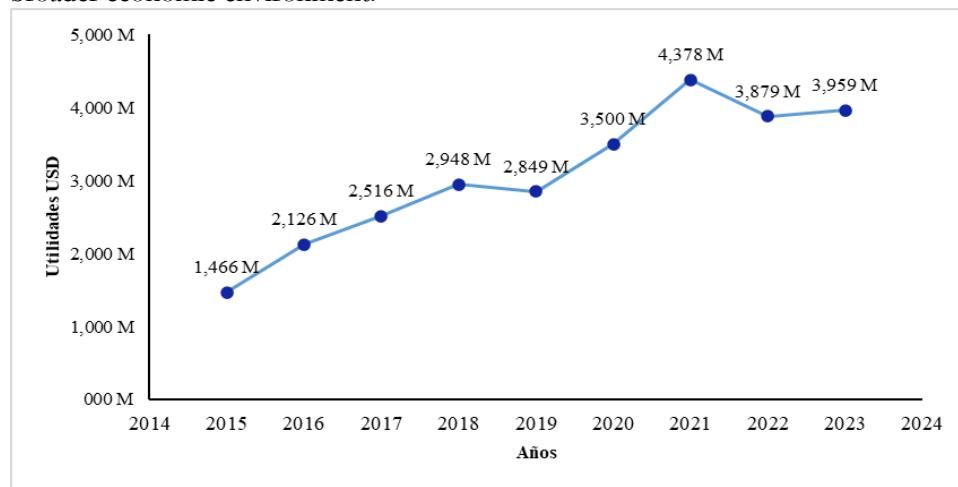


Figura 2. Saving and Credit Cooperatives' Profits (2015–2023)

Note: Superintendence of the Popular and Solidarity Economy - SEPS (2022)

The number of active cooperatives in the province has recorded a progressive decline, dropping from 15 in 2015 to only 7 in 2023. This reduction reflects a process of institutional concentration and sector restructuring, where fewer entities operate but with greater financial efficiency, as evidenced by the growth in their profits.

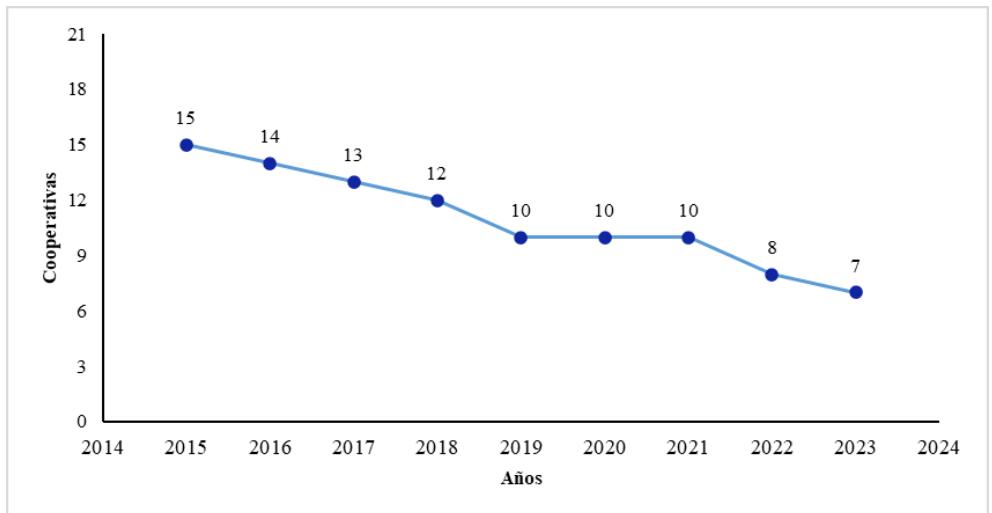


Figure 3. Number of active cooperatives per year in El Oro (2015–2023)

Note: Superintendence of Popular and Solidarity Economy – SEPS (2022)

The number of cooperative members grew steadily during the study period, starting with 3,507 people in 2015 and exceeding 5,600 members in 2023. This increase reflects greater participation by the population in the cooperative system, as well as the strengthening of the solidarity economy model in the province.

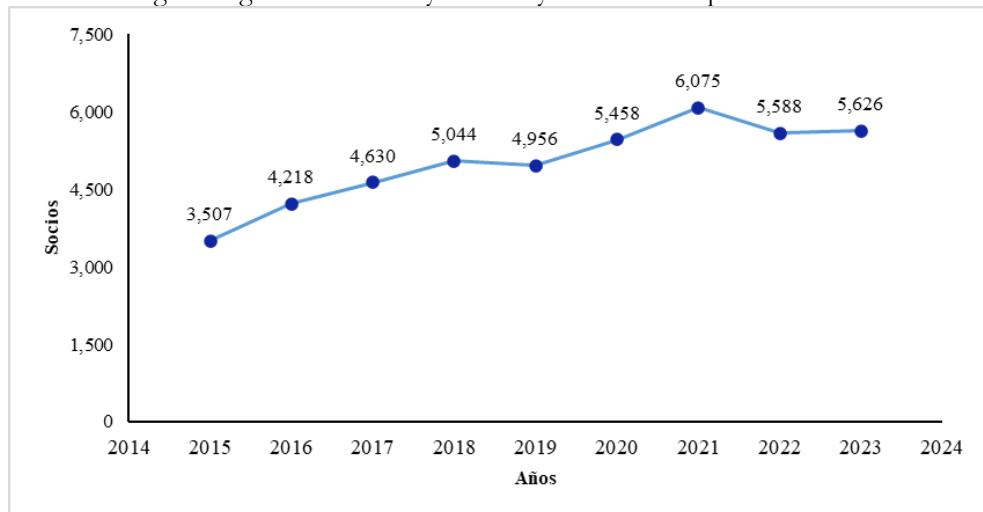


Figure 4. Number of members in cooperatives El Oro (2015–2023)

Note: Superintendence of Popular and Solidarity Economy – SEPS (2022)

The Pearson correlation matrix reveals key relationships between the provincial GDP and the variables of the cooperative system. The GDP shows a moderate positive correlation with profits (0.6632) and with the number of members (0.5879). This indicates that as the profits of the cooperative sector increase and citizen participation grows, an increase in the provincial Gross Domestic Product is also observed. This relationship suggests a significant connection—though not a perfectly linear one—between the performance of cooperatives and local economic development. In other words, GDP growth appears to be partially driven by the financial dynamism and the social base of these entities.

Conversely, the number of active cooperatives shows a strong negative correlation with all other variables: -0.7729 with GDP, -0.8813 with profits, and -0.8602 with the number of members. This reveals a clear trend: as the number of cooperatives decreases, the remaining entities concentrate higher profits and more members, suggesting a sector consolidation. Far from representing a contraction, this reduction may be associated with greater operational and economic efficiency, with fewer actors generating a larger impact. This phenomenon also aligns with the hypothesis

that institutional quality and operational scale have been more decisive than the sheer quantity of entities in driving economic growth in El Oro.

Table 2. Correlation Matrix between Provincial GDP and Cooperative System Variables (2015–2023)

Variable	GDP	Profits	Nº of Cooperatives	Nº of Members
GDP	1.0000			
Profits	0.6632	1.0000		
Nº of Cooperatives	-0.7729	-0.8813	1.0000	
Nº of Members	0.5879	0.9898	-0.8602	1.0000

To determine the impact of the cooperative system variables on the Gross Domestic Product (GDP) of the province of El Oro, a multiple linear regression model was applied. The analysis included as independent variables the annual profits of the cooperatives, the number of active cooperatives, and the total number of registered members, while the provincial GDP served as the dependent variable.

Table 3. Summary statistics of the multiple regression model

Regression Statistics	
Multiple correlation coefficient	0.8787
Coefficient of determination R^2	0.7720
Adjusted R^2	0.6353
Observations	9

The table presents the primary indicators summarizing the performance of the multiple regression model applied to explain the variation in provincial GDP based on the variables of profits, number of cooperatives, and number of members, all transformed via Z-score. The multiple correlation coefficient (R) is 0.8787, indicating a strong joint linear relationship between the explanatory variables and the dependent variable. In practical terms, this signifies that the independent variables, when combined, possess a high predictive power over the GDP.

The coefficient of determination R^2 shows that the model explains 77.20% of the total variability of the GDP—a significant proportion reflecting a good model fit to the observed data. However, the Adjusted R^2 , which corrects the R^2 based on the number of variables and observations to prevent overfitting, is 63.53%. This value indicates that while the model maintains a strong explanatory level, part of the variability may be influenced by factors not considered in the analysis or by the limited number of available observations ($n = 9$), corresponding to the years of the study period (2015–2023).

The number of observations is limited, which presents a constraint for statistical robustness; nonetheless, within the context of temporal and sectoral analysis, these results provide a solid foundation for the interpretation and validation of the impact of the independent variables on the provincial GDP.

Table 5. Estimates of coefficients and standard errors of the multiple regression model

Variable	Coefficient	Standar Error
Profits (USD Millions)	2.9960	1.6417
Number of Cooperatives	-0.6839	0.4591
Number of Members	-2.9658	1.5216
Constant	-8.55E-17	0.2013

The model estimates coefficients that demonstrate how each variable impacts the standardized GDP, incorporating their respective standard errors to measure precision. Profits exhibit a positive coefficient of 2.9960, indicating that an increase in cooperative profits has a directly proportional and significant effect on the provincial GDP. This confirms that the profitability of the cooperative sector serves as a fundamental engine for regional economic growth, as higher profits translate into more resources available for investment and consumption.

Conversely, the negative coefficient of -0.6839 for the number of cooperatives reflects that a mere increase in the quantity of entities does not translate into GDP growth. This suggests a potential saturation or a decrease in operational efficiency as the number of institutions rises, which limits the positive impact of each individual cooperative on the provincial economy. Furthermore, not all cooperatives generate the same level of added value or contribute equitably to economic development.

Similarly, the number of members presents a negative coefficient of -2.9658, with a standard error of 1,5216. This indicates that expanding the membership base without parallel improvements in efficiency or profitability may actually represent a burden on economic growth. This phenomenon is explained by the fact that the volume of members alone does not guarantee a greater financial contribution or better performance, emphasizing the critical importance of cooperative management quality and the active participation of its members.

Finally, the constant (intercept) near zero with a low standard error reflects that the model is well-centered and does not exhibit bias when the explanatory variables are at their mean, confirming the robustness of the model fit. Collectively, these results demonstrate that to boost provincial GDP, it is crucial to focus on the profitability and efficiency of the cooperative sector rather than the simple increase in the number of entities or affiliates.

Discussion

The results obtained in this research confirm and expand upon previous findings regarding the role of savings and credit cooperatives in local economic development, such as those presented by Buestán Pesántez (2023), who highlighted their relevance in vulnerable contexts. The positive and significant relationship between cooperative profits and provincial GDP supports studies like that of Escandon Dutan and Fernández Sacotto (2023), which emphasize profitability as an essential component for the cooperative sector to have a tangible impact on economic growth.

However, the negative relationship between the number of active cooperatives and members with the GDP challenges the notion that a greater institutional volume or membership base automatically guarantees higher development. This finding complicates the traditional approach of quantitative expansion, demonstrating that "more" does not always mean "better."

According to Sarmiento Vintimilla and Paredes Lucero (2024), strengthening the popular and solidarity economy does not depend solely on the number of entities but on their ability to articulate sustainable productive networks. Along these lines, SENPLADES (2013) maintains that local development is enhanced when cooperatives integrate efficient management mechanisms that promote equity and income redistribution. Nevertheless, the negative correlation observed between membership volume and GDP aligns with warnings from Sanchez Zambramo (2025) and Collaguazo Simbaña (2021), who suggest that excessive expansion without efficient management can deteriorate the sector's sustainability.

From a technical perspective, this contrast highlights the importance of factors such as operational efficiency, management quality, and financial sustainability as mediating variables between the structural growth of the cooperative sector and its economic impact (Ramírez Velásquez et al., 2024). The application of the Z-score allowed for the homogenization of variables with different scales, ensuring comparability within the multiple regression model and providing robustness to the analysis (Solórzano Hernández et al., 2023).

Furthermore, the longitudinal nature of the study reveals that, throughout the analyzed period, the reduction in the number of cooperatives coincided with a greater consolidation of the most profitable ones. This reflects a process of institutional maturation and refinement that, far from being negative, has been favorable for the provincial GDP (Bohórquez Cáceres and Ricaurte Ortega, 2024).

Theoretically, these findings enrich the understanding of the popular and solidarity economy in regional contexts, indicating that truly sustainable growth arises when volume is combined with quality (Hidalgo Mayorga and Rivera Solano, 2024). In practice, this implies that public policies should focus not on indiscriminately increasing the number of cooperatives or affiliates, but on strengthening entities with the best institutional and financial performance (Zambrano Loor and Zamora Cusme, 2025). This orientation would allow for not only a greater contribution to economic development but also a more solid, resilient, and lasting financial inclusion.

Ultimately, this analysis invites a rigorous review of traditional cooperative expansion strategies. It is not enough to increase territorial coverage or the number of members; the fundamental challenge lies in generating tangible value for communities through modern, transparent, and sustainable management models (Valor Salas, 2024). In this

sense, the study proposes a shift in focus toward a more strategically oriented popular and solidarity economy, where qualitative growth prevails over mere quantitative growth.

Conclusion

This research demonstrates that savings and credit cooperatives in the province of El Oro during the 2015–2023 period have played a crucial role in local economic development, although their influence has been neither homogeneous nor linear. Beyond the quantitative expansion of the sector, the real determinants of impact are institutional solidity, operational efficiency, and the capacity to generate profits—elements that allow cooperatives to consolidate as strategic actors in the provincial economy.

The analysis proves that a higher number of cooperatives or members does not guarantee sustained economic development. On the contrary, only those entities with solid structures, efficient management, and positive financial results manage to significantly influence the provincial Gross Domestic Product. Numerical expansion without the accompaniment of adequate management mechanisms may reflect disorganized growth that limits real economic value generation and could even compromise the sector's sustainability.

Findings show that profitability is the primary factor determining economic impact, while variables such as the number of cooperatives and members present weak or even inverse relationships with the GDP. This highlights that the sector's contribution to local development is not measured by the quantity of actors, but by their capacity for effective management, institutional quality, and sustained economic performance. Operational efficiency thus becomes the true engine that powers financial inclusion and territorial development.

Furthermore, the research identifies that sector growth must be interpreted from a qualitative and strategic perspective, considering how organizational structure, management processes, and financial sustainability determine the capacity of cooperatives to generate positive economic and social impacts. Cooperatives with solid management not only strengthen the local economy but also generate trust and social cohesion, fostering a more balanced and equitable development in the communities where they operate.

Despite these insights, the study presents certain limitations that should be considered in future research. First, the analysis relied on secondary information from official sources, restricting the ability to explore qualitative variables such as member satisfaction levels or internal governance efficiency. Second, the research focused solely on the province of El Oro; therefore, results cannot be generalized to other regions of the country with different cooperative structures. Finally, future studies should incorporate mixed methods, utilizing interviews or direct surveys with cooperative actors to complement statistical views with a more comprehensive understanding of the social and organizational factors influencing sector performance.

Consequently, the evidence suggests that territorial development policies and strategies should focus on strengthening institutionality, optimizing management, and guaranteeing the financial sustainability of the cooperative sector. Implementing measures aimed at improving operational efficiency and institutional solidity will maximize the sector's potential as an agent of economic and social transformation, favoring inclusive, sustained, and resilient local development.

Ultimately, this study reaffirms that the true added value of the cooperative sector lies not in mere quantitative expansion, but in the combination of institutional quality, operational efficiency, and financial sustainability. This serves as a benchmark for formulating public policies and development strategies that promote financial inclusion, economic equity, and the consolidation of more prosperous and sustainable territories.

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