

IMPACT OF INFORMATION TECHNOLOGY ON THE PROFITABILITY OF SMES IN ECUADOR

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ABSTRACT

This study evaluated the impact of investment in social networks on the return on investment (ROI) in Ecuadorian companies, considering the economic sector and the size of the company. Through a quantitative methodology, 384 companies were analyzed using descriptive statistics, ANOVA tests and linear regression. The results showed that the relationship between investment and ROI is weak and not significant ($R^2 = 0.00734$), suggesting that other factors, such as the quality of advertising strategies, could be more determinant. Medium and small companies in the commerce sector presented the highest ROIs, while micro-enterprises stood out in the service sector, reflecting their ability to optimize resources. However, the high variability in investments and returns indicates a lack of standardization in digital strategies. Assumption checks confirmed the validity of the statistical analysis, although the included variables explained only a small fraction of the ROI variation. It is concluded that companies must improve their digital strategies through training, adoption of advanced technologies and differentiation by sector. This is consistent with the literature reviewed, which highlights the importance of campaign segmentation and optimization to maximize ROI. This study offers recommendations for Ecuadorian companies to strengthen their competitiveness in the digital environment.

Keywords: Digital marketing; Information technology; Small and medium-sized enterprises; Social Media

INTRODUCTION

In the Ecuadorian economic panorama, small and medium-sized enterprises (SMEs) represent an essential pillar of productive activity. These companies make up more than 99% of the country's business fabric, according to data from the National Institute of Statistics and Censuses (INEC, 2021), and play a crucial role in job creation and gross

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domestic product (GDP). However, they face significant challenges related to technological modernization and the integration of digital tools into their operations. As global markets go digital (Sahabuddin et al., 2024), Ecuadorian SMEs face increasing pressure to adapt to new technologies that allow them to compete effectively, both locally and internationally. Among these tools, social networks emerge as one of the most accessible and effective platforms for business promotion and income generation (Dunford et al., 2024). However, the use of these tools is still underutilized, with less than 40% of SMEs implementing digital strategies as an integral part of their business model (Interactive Symbol Marketing Agency, 2024).

International literature supports the importance of investing in digital strategies to improve business profitability (Cheratian et al., 2024). Almestarihi et al. (2024) They point out that measuring the return on investment (ROI) in paid advertising campaigns is crucial to evaluate the financial impact of digital strategies. According to their analysis, companies that allocate resources to well-planned digital advertising achieve significant increases in revenue and brand awareness. This finding resonates with the need for Ecuadorian SMEs to optimize their limited financial resources and justify each expenditure, especially in an economic context characterized by budgetary constraints.

Another relevant study is that of Andrei and Veltri (2024), which explores how detailed product descriptions on digital platforms influence purchasing decisions. Although its main focus is the market for illicit goods, the underlying principle of persuasion through visual and textual content is highly applicable to Ecuadorian SMEs. This concept reinforces the importance of creating engaging content tailored to the characteristics of local audiences, which can be a critical differentiator in a saturated market.

For its part, Aridor and Che (2024) They analyze the impact of privacy regulations on the effectiveness of targeted advertising. In the Ecuadorian context, where there is still no robust legislation around data protection, SMEs can take advantage of this lack of restrictions to implement personalized and targeted campaigns, albeit with an ethical approach. This approach can be crucial to maximizing the impact of digital advertising investments.

Bajaj et al. (2024) They present the concept of neuromarketing applied to programmatic advertising, highlighting how artificial intelligence tools can enhance the effectiveness of digital strategies. This study underscores the importance of understanding consumer behavior in order to design campaigns that not only capture attention, but also drive action. For Ecuadorian SMEs, adopting emerging technologies such as neuromarketing could represent a significant competitive advantage, especially against larger and more well-resourced competitors.

In terms of business sustainability, Birim et al. (2024) They look at how companies can balance their financial goals with social and environmental impact through optimized advertising strategies. In Ecuador, where sustainability is gaining importance in the business environment, these strategies could be implemented by SMEs to not only increase their revenues, but also align with the demands of more conscious consumers.

Hariyanto (2024) offers a practical example of the impact of social media on SMB profitability by analyzing how the use of TikTok helped an Indonesian small business increase its sales. This case illustrates how digital platforms can level the playing field for small businesses, providing access to massive audiences with relatively low investment. This approach is particularly relevant for Ecuadorian SMEs, many of which operate with limited advertising budgets.

Lambrecht et al. (2024) they highlight the phenomenon of inter-temporal substitution between television advertising and online sales, a finding that has direct implications for SMEs seeking to diversify their promotion channels. In the Ecuadorian context, where television remains a dominant advertising medium, this study highlights the need to integrate digital strategies to complement and, in some cases, replace traditional marketing methods.

The work of Zhou et al. (2024) in the use of machine learning algorithms to optimize advertising strategies reinforces the idea that advanced technologies can be key tools for SMEs. Although access to these technologies may be limited in Ecuador, their implementation could be facilitated through collaborations with digital marketing agencies or government training programs.

Finally, Wang et al. (2024) They examine the impact of European legislation on digital advertising, underlining the importance of considering the regulatory context when designing advertising strategies. Although Ecuadorian SMEs operate in a less regulated environment, anticipating future regulations can allow them to stay ahead of the curve and develop more sustainable and effective strategies.

These international studies coincide in highlighting that digital strategies, when implemented correctly, have a positive and direct impact on business profitability. This article seeks to adapt and apply these lessons to the Ecuadorian context, exploring how local SMEs can overcome barriers such as lack of knowledge, limited resources, and cultural resistances to make the most of digital opportunities.

Despite these opportunities, the central problem lies in the underutilization of digital tools by Ecuadorian SMEs. This is due to a variety of causes, including a lack of technological training, the perception of high upfront costs, and a cultural resistance to change (Henriksen et al., 2024; Sulistyaningsih et al., 2024; Yang et al., 2024). These limitations not only restrict the scope of marketing strategies, but also directly affect revenue generation. As a result, many SMEs lose competitiveness to companies that have already adopted more advanced digital approaches.

The causes of this problem include, firstly, the lack of digital training among SME owners and managers, who often lack the necessary skills to implement social media strategies (Aridor & Che, 2024). Second, financial constraints limit their ability to invest in digital advertising, while the absence of a clear regulatory framework contributes to the perception of uncertainty about the return on these investments (Cheratian et al., 2024). Finally, cultural factors, such as the preference for traditional methods of promotion, hinder the adoption of emerging technologies (Hariyanto, 2024).

The effects of these limitations are significant. The competitiveness of SMEs is affected, resulting in lower market share and reduced revenues (Zouaoui & Hamdi, 2024). In addition, the lack of digital presence prevents these companies from establishing strong and lasting relationships with their customers, thus limiting their ability to build customer loyalty (Yenipazarli, 2024). In the long term, these shortcomings can lead to the stagnation or even closure of many SMEs, affecting both their employees and the local economy as a whole (Fang et al., 2024).

The theoretical rationale for this study is based on evidence that well-designed digital strategies can transform companies' financial performance. Studies such as Dunford et al. (2024) demonstrate how digital platforms can be regulated to optimize advertising and protect consumers, while Zhou et al. (2024) highlight the role of advanced technologies

in personalizing and improving advertising strategies. These principles are applicable to the Ecuadorian context, where SMEs can benefit significantly from increased adoption of information technologies.

Methodologically, this study will be based on a mixed approach that combines quantitative and qualitative methods. The quantitative analysis will focus on measuring the ROI of digital campaigns, while the qualitative analysis will explore SMB managers' perceptions of the barriers and opportunities associated with digital marketing. This approach, inspired by studies such as that of Wang et al. (2024), will allow a more comprehensive understanding of the problem.

In practical terms, this paper seeks to provide specific recommendations for Ecuadorian SMEs to adopt digital strategies effectively. This includes designing training programs, promoting public policies to support digitalization, and developing clear indicators to assess the impact of social media investments.

The overall objective of this study is to evaluate the impact of investment in social networks on the profitability of SMEs in Ecuador. To this end, three specific objectives are proposed. The first is to conduct a thorough review of the relevant scientific literature to identify best practices and trends in digital marketing. The second focuses on developing a robust quantitative methodology to measure the ROI and other key indicators of digital ad campaigns. The third seeks to interpret the results obtained to generate practical and theoretical recommendations that benefit Ecuadorian SMEs.

Overall, this research seeks to contribute to the understanding of how SMEs in Ecuador can overcome current barriers and take advantage of the potential of social networks to increase their profitability, thus strengthening their competitiveness in a globalized and constantly evolving market.

MATERIALS AND METHODS

The present study adopts a quantitative approach, characterized by the use of numerical data and statistical analysis to explore the relationship between investment in social networks and the profitability of small and medium-sized enterprises (SMEs) in Ecuador. This approach is appropriate due to the nature of the problem, which requires an objective measurement of the financial impact of digital strategies in a specific business context. The design, population, sample, study variables, and statistical procedure used are described in detail below.

2.1 Study design

The research design is non-experimental, since the study variables will not be manipulated. Instead, existing data will be observed and analyzed to identify relationships between variables. The design is cross-sectional, which implies that the data were collected at a single point in time, specifically during the year 2023. This approach provides a snapshot of the current situation of SMEs in Ecuador with respect to the use of social networks and their profitability.

The study is also descriptive and correlational. On the one hand, the main characteristics of the participating companies are described, including their investment patterns in social networks and their profitability indicators. On the other hand, it seeks to establish relationships between these variables, particularly if the use of digital strategies is associated with a higher return on investment (ROI).

2.2 Population and sample

The target population of this study comprises the 1,246,162 companies registered in Ecuador in 2023, according to the Directory of Companies and Establishments (DIEE) published by the National Institute of Statistics and Census (INEC). These companies cover various economic sectors, sizes and levels of digitalization, although the analysis focuses on small and medium-sized enterprises (SMEs), due to their predominance and relevance in the Ecuadorian economic context.

Given the size of the population, it would be unfeasible to conduct a census study due to time and resource constraints. Therefore, a representative sample was determined using a statistical calculation based on a confidence level of 95% and a margin of error of 5%. According to this calculation, 384 companies were selected to be part of the sample. This size is sufficient to guarantee statistically significant and generalizable results within the context of SMEs in Ecuador.

The selection of the companies was carried out through stratified random sampling, dividing the population into strata according to their economic sector (commerce, manufacturing, services, etc.) and size (micro, small or medium-sized enterprises). This approach ensures that the sample reflects the diversity of the population and allows for comparative analyses between different types of companies.

2.3 Study variables

In this study, the following variables were analyzed:

Independent variable: The amount of investment in social networks, expressed in US dollars, obtained from the breakdown of marketing and advertising expenditures in the financial statements of the companies.

Dependent variable: The return on investment (ROI), calculated using the formula: This indicator measures the return generated for each dollar invested in social networks, providing a direct metric of the financial impact of these strategies.

Control variables: Factors such as firm size (micro, small, or medium-sized) and economic sector (trade, manufacturing, services) were included to control for their possible influence on the relationship between the primary and dependent variables.

2.4 Data collection

In this study, data collection was carried out from official secondary sources, specifically the financial statements of the companies registered until 2023 with the Superintendence of Companies of Ecuador. This approach allowed access to reliable and uniform quantitative data on the variables of interest: the amount of investment in social networks as an independent variable and the return on investment (ROI) as a dependent variable.

The use of official financial data guarantees the objectivity and accuracy of the information, eliminating possible biases introduced by self-reported answers or subjective perceptions of the participants. In addition, this collection method offers a wider and more uniform coverage of the selected sample, facilitating statistical analysis and interpretation of the results.

The financial statements analyzed included details on marketing and advertising expenses, breaking down investments specifically aimed at social networks. Likewise, gross income and operating profit were taken to calculate ROI as an indicator of profitability. This data was collected in digital format through the Superintendence of Companies platform, complying with the procedures and regulations established for access to business information.

2.5 Sample Identification

384 companies were selected from the database of the Superintendence of Companies, using a stratified random sampling. The strata were defined according to the size of the company (micro, small and medium) and the economic sector (commerce, manufacturing, services, etc.), ensuring an adequate representation of the total population of companies registered in Ecuador.

2.6 Data extraction

The financial statements of the selected companies were downloaded directly from the database of the Superintendence of Companies. To ensure the integrity of the data, it was verified that the companies had complete and updated financial information corresponding to the fiscal year 2023.

2.7 Coding and organization

Once extracted, the financial data was coded in a structured database, organizing the information according to the variables of interest: amount invested in social networks, revenue generated, total costs and ROI. Control variables, such as economic sector and firm size, were also included.

2.8 Statistical analysis

The statistical analysis was designed to address the descriptive and correlational objectives of the study. The techniques employed include:

Descriptive analysis: Descriptive statistics (mean, median, mode, standard deviation and ranges) were calculated to describe the main characteristics of the participating companies. This included the average amounts invested in social networks, the average ROI and the variations according to the size and economic sector of the companies.

Correlation tests: Pearson's correlation coefficient was used to explore the relationship between social media investment and ROI. This analysis allowed to determine the strength and direction of the association between the variables.

Multiple linear regression: A multiple linear regression model was applied to analyze the impact of the amount of investment in social networks on ROI, controlling for the size of the company and the economic sector. This model made it possible to identify the specific contribution of investment in social networks to business profitability.

Cross-group comparisons: Analyses of variance (ANOVA) were performed to compare the average ROI between companies from different economic sectors and sizes. This allowed us to identify possible significant differences in the impact of social networks according to the business context.

Visualization of results: The results were presented using graphs and tables, including scatter plots to show the relationship between social media investment and ROI, bar charts for cross-industry comparisons, and summary tables with descriptive statistics.

2.9 Ethical considerations

The study was conducted in strict ethical standards. The financial data used is public and available through the Superintendence of Companies, which guarantees that its use is legally and ethically appropriate. No identifiable information of the participating companies was disclosed, protecting their confidentiality. In addition, the results were presented in an aggregated form to avoid the identification of individual companies.

2.10 Limitations

While the official financial data-based approach offers significant advantages, it also has certain limitations. First, financial statements may not reflect all the details of digital marketing strategies, especially in companies with less detailed financial records. Second, the cross-sectional design limits the ability to establish definitive causal relationships between social media investment and ROI. Finally, the exclusion of companies with incomplete data could introduce a bias into the sample.

The revised methodology provides a robust approach to measure the impact of social media investment on the profitability of SMEs in Ecuador. By using official financial data and advanced statistical techniques, this study guarantees the objectivity and accuracy of its findings, contributing to academic knowledge and offering practical insights for the development of effective digital strategies in the Ecuadorian business context.

RESULTS

3.1 Descriptive results

According to Table 1, investment in social networks varies significantly between economic sectors and company sizes. In the trade sector, medium-sized companies have an average investment of \$2597.17, which is slightly higher than micro-enterprises, which invest \$2461.11 on average. Small businesses, on the other hand, have a similar average of \$2587.76. However, microenterprises show a lower dispersion in the amounts invested, as evidenced by their standard deviation of \$1096.65, while small and medium-sized companies present greater variability in their investments. This suggests that, in the commerce sector, microenterprises tend to maintain more homogeneous strategies in their budgets for social networks.

In the manufacturing sector, medium-sized companies lead in average investment with \$3103.97, a significantly higher figure than microenterprises, which reach an average of \$2710.09, and small companies, which invest an average of \$2556.85. This pattern indicates that mid-sized manufacturing companies tend to allocate greater resources to digital strategies, possibly reflecting a more strategic approach or greater financial capacity to take advantage of social media marketing opportunities. However, small businesses in this sector show the highest standard deviation (\$1462.35), evidencing greater heterogeneity in their investment levels.

In the services sector, small businesses have the highest average investment in social networks, with \$2775.83, surpassing both microenterprises (\$2426.09) and medium-sized enterprises (\$2668.54). The highest median also corresponds to small businesses, reaching \$2940.79, suggesting that a considerable number of companies in this group allocate high amounts to social networks. In contrast, microenterprises in this sector, although they have a lower average, show less dispersion in their amounts, which indicates greater consistency in their investment strategies.

Table 1. Descriptive statistics

	Economic Sector	Company Size	N	Media	Medium	Desv.Est.	Minimum	Maximum
Social Media Investment (USD)	Trade	Medium	43	2597.174	2464.430	1440.5686	529.520	4958.260
		Micro	44	2461.111	2406.790	1096.6475	586.810	4694.840
		Small	36	2587.762	2077.690	1139.7081	893.870	4985.600
	Manufacturing	Medium	43	3103.973	3364.400	1353.9761	669.450	4984.390
		Micro	40	2710.090	2445.645	1278.4201	630.100	4927.150
		Small	51	2556.852	2213.500	1462.3467	501.630	4977.110
	Services	Medium	41	2668.542	2490.470	1379.9244	791.220	4985.460
		Micro	46	2426.091	2244.420	1264.2974	571.030	4940.370
		Small	40	2775.827	2940.785	1339.3140	523.700	4926.780
ROI (%)	Trade	Medium	43	0.438	0.444	0.0916	0.195	0.625
		Micro	44	0.418	0.409	0.0974	0.246	0.642
		Small	36	0.431	0.431	0.0869	0.262	0.607
	Manufacturing	Medium	43	0.428	0.416	0.0969	0.139	0.621
		Micro	40	0.421	0.401	0.0716	0.304	0.572
		Small	51	0.417	0.417	0.0937	0.238	0.593
	Services	Medium	41	0.397	0.395	0.0831	0.233	0.611
		Micro	46	0.434	0.420	0.0804	0.269	0.639
		Small	40	0.406	0.409	0.0928	0.192	0.630

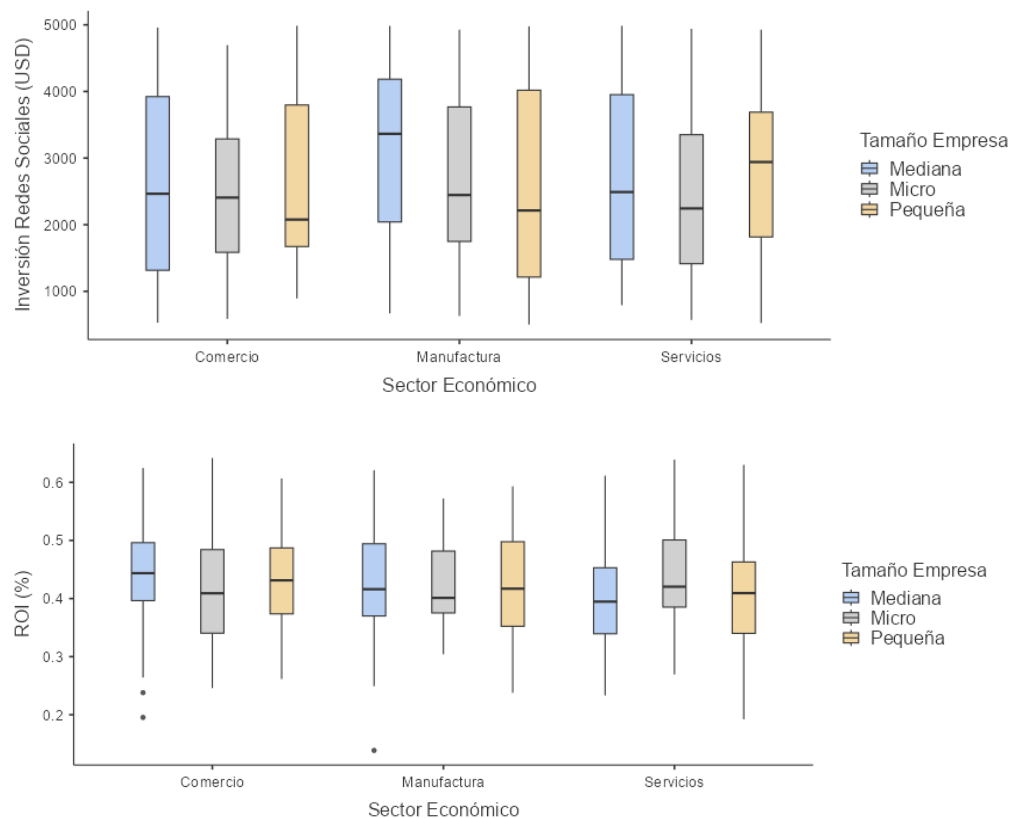
Source: Own elaboration

In terms of return on investment (ROI), the commerce sector stands out with a higher average ROI among medium-sized companies, reaching 43.8%. This group also has the highest median at 44.4%, indicating more consistent and effective returns relative to their investment. Small businesses in this sector follow closely with an average ROI of 43.1%, while microbusinesses have a slightly lower return of 41.8%. The highest standard deviation in this group corresponds to microenterprises (0.0974), reflecting greater variability in their financial results.

In the manufacturing sector, the average ROI is relatively similar between medium-sized companies (42.8%) and micro-enterprises (42.1%), while small companies have a slightly lower average ROI of 41.7%. However, microenterprises have a lower standard deviation (0.0716), suggesting more consistent returns compared to the other categories. This could reflect a more uniform optimization of digital strategies in this segment.

The services sector, on the other hand, shows a different behavior. Microenterprises achieve the highest average ROI at 43.4%, outpacing both medium-sized (39.7%) and small businesses (40.6%). This finding is remarkable, as it indicates that microenterprises, although they invest less on average, manage to optimize their resources to obtain better returns. On the other hand, small companies present the greatest variability in results, as reflected by their standard deviation of 0.0928.

Figure 1. Mustache Box



Source: Own elaboration

Figure 1, both representations suggest that size and economic sector have a significant impact on social media investment and associated returns. While medium-sized companies tend to lead in investment, micro-enterprises in the service sector are better able to optimize the available resources to obtain a higher ROI. This analysis reinforces the need to customize digital strategies according to the size and sector of each company, focusing on maximizing the efficiency of the investments made.

In general terms, medium-sized companies in the commerce sector stand out as the ones that most efficiently convert their investment in social networks into financial returns. However, microenterprises in the service sector are also notable for their ability to optimize resources, achieving high ROIs with more modest investments. On the other hand, the high variability in the results of small companies suggests a lack of standardization in the strategies used, which could represent an opportunity for improvement for this group.

These results highlight the importance of adapting digital marketing strategies not only to the size of the company, but also to the specific characteristics of each sector. In addition, they underscore the need to optimize social media investment to maximize ROI, especially in sectors such as manufacturing and services, where returns tend to be less consistent. This analysis provides a basis for Ecuadorian companies to adjust their strategies and more effectively take advantage of the opportunities offered by social media in today's competitive environment.

3.2 Correlation results

The correlation matrix in Table 2 shows a very weak relationship between return on investment (ROI) and investment in social networks, represented by a correlation coefficient of 0.044. This value indicates that there is practically no significant linear association between these two variables. In other words, the data doesn't show that an increase in social media spend is directly related to a positive or negative change in ROI.

This result suggests that, although companies are allocating resources to social networks, other factors may be influencing the returns obtained. For example, the effectiveness of the strategies used, the quality of the content, or even external factors such as market characteristics or the target audience, could have a greater impact on ROI. It is necessary to deepen the analysis by including additional variables or different methodologies to better understand the relationship between investment and return in this business context.

Table 2. *Correlation Matrix*

	ROI (%)	Social Media Investment (USD)
ROI (%)	—	
Social Media Investment (USD)	0.044	—

Source: Own elaboration

3.3 Linear regression

Table 3 of ANOVA presented analyzes whether there are significant differences in return on investment (ROI, %) depending on the economic sector, the size of the company and the interaction between both variables. The results suggest that none of these factors have a statistically significant

impact on ROI, indicating that the variations observed in the data cannot be directly explained by these variables.

As for the effect of the economic sector, the sum of squares is 0.01777, with 2 degrees of freedom (gl), which results in a square mean of 0.00889. The calculated F-value is 1.126, and the associated p-value is 0.325. This p-value, being greater than 0.05, indicates that there are no significant differences in ROI between economic sectors (trade, manufacturing, and services). This means that no matter what industry a company belongs to, the return generated by social media investments doesn't vary significantly.

In relation to the size of the firm, the sum of squares is 0.00279, with 2 degrees of freedom, resulting in a square mean of 0.00140. The value of F is 0.177, and the p-value is 0.838. This result suggests that there are no statistically significant differences in ROI according to the size of the company (micro, small or medium). This means that, in this analysis, companies of different sizes achieve similar returns from their investments in social networks.

Likewise, the interaction between the economic sector and the size of the company does not show a significant effect on ROI. The sum of squares associated with this interaction is 0.04171, with 4 degrees of freedom, and a mean square of 0.01043. The value of F is 1.321, and the p-value is 0.262. This p-value indicates that there is no significant interaction between these two variables, i.e., the impact of the economic sector on ROI does not depend on the size of the company, nor vice versa.

Finally, the residuals show a sum of squares of 2.96003, with 375 degrees of freedom, resulting in a square mean of 0.00789. This component reflects the variation in ROI that cannot be explained by the economic sector, the size of the company or the interaction between both variables, the results of the ANOVA analysis indicate that neither the economic sector, nor the size of the company, nor the interaction between these variables have a significant effect on the ROI obtained by investments in social networks. This suggests that other factors, possibly related to the quality and effectiveness of advertising strategies, could play a more important role in determining return. Therefore, it is recommended to explore additional variables and dig deeper into the design of marketing campaigns to identify the key elements that influence the return on digital investments.

Table 3. ANOVA - ROI (%)

	Sum Squares	of Good luck	Mean Square	F	p
Economic Sector	0.01777	2	0.00889	1.126	0.325
Company Size	0.00279	2	0.00140	0.177	0.838
Economic Sector * Company Size	0.04171	4	0.01043	1.321	0.262
Waste	2.96003	375	0.00789		

DISCUSSION

The results of this study reveal that although Ecuadorian companies are investing in social media marketing strategies, this investment does not show a statistically significant impact on ROI. This can be due to several factors. First, many companies may not be optimizing their use of social media, either due to a lack of knowledge or poorly executed strategies. Previous studies such as that of Almestarihi et al. (2024) have highlighted that ROI depends not only on investment, but also on the quality of the strategies employed, such as appropriate audience segmentation and the creation of relevant content.

In sectoral terms, although the trade sector showed a higher average ROI, the differences were not significant. This could be explained by the inherent characteristics of the sectors. Companies in the retail sector may benefit more directly from social media due to the transactional nature of their business, while sectors such as manufacturing and services could experience a more indirect or long-term impact.

The lack of a meaningful relationship between investment and ROI may be a reflection of a resource allocation strategy that does not maximize the potential of social media. According to Bajaj, et al. (2024), neuromarketing and data analytics can be crucial tools to optimize the return on investment in digital campaigns, strategies that may be absent in many Ecuadorian SMEs. Another possible explanation for these results is that smaller companies, while achieving a slightly higher ROI, may be limited by their resources and not reach the level of investment needed to deliver more significant results. This finding is consistent with Birim et al. (2024), who suggest that small businesses face greater barriers to implementing effective advertising strategies.

The fact that the ANOVA analysis did not detect significant differences between company sizes or sectors could be related to the homogeneity in social media marketing practices between these categories. This suggests an opportunity for companies to develop more differentiated strategies tailored to their specific contexts. Finally, the results of linear regression raise the need to explore additional variables that can moderate or mediate the relationship between social media investment and ROI, such as the quality of the content, the type of platform used, or the level of interaction of the target audience with the campaigns. These factors could be the subject of future research to better understand the dynamics of digital profitability in Ecuadorian SMEs.

Although social media represents a valuable tool for SMEs, the results of this study underscore the importance of designing and executing more effective strategies that can translate investments into tangible economic benefits. This finding has practical implications for companies and policymakers, who should focus their efforts on training companies in the strategic use of these platforms and in constantly monitoring the impact of their digital campaigns.

CONCLUSIONS

This study has evaluated the impact of investment in social networks on the return on investment (ROI) in Ecuadorian companies, considering the size of the company and the economic sector. The conclusions are then presented organized in relation to the objectives set and contrasted with the findings of the relevant references.

The literature highlights the importance of measuring and optimizing digital strategies to maximize ROI. For example, Almestarihi et al. (2024) emphasize that the success of digital campaigns depends to a large extent on adequate measurement of return and well-executed strategies. This study confirmed that, although Ecuadorian companies invest in social networks, the average ROI

was relatively low and did not show a significant relationship with the amounts invested. This is in line with the findings of Bajaj et al. (2024), who stress that the use of advanced technologies, such as neuromarketing, is crucial to optimizing results, an approach that seems to be absent in most of the companies analyzed.

Additionally, Aridor and Che (2024) argue that regulations and ethical data management can also influence the effectiveness of digital strategies. Although this aspect was not directly evaluated in the present study, it could be relevant in the Ecuadorian context, where companies still face challenges in the implementation of ethical and transparent strategies.

The methodology used made it possible to analyze the differences in investment and ROI according to the size of the company and the economic sector. However, the ANOVA results and regression analysis showed that neither industry nor firm size has a significant effect on ROI. These results differ from the findings of Hariyanto (2024), who highlighted that microenterprises can significantly benefit from well-designed digital strategies, especially on platforms such as TikTok. While micro-enterprises in the service sector showed a slightly higher ROI in this study, the relationship was not statistically significant, suggesting that these companies are not maximizing the potential of their social media investments.

The descriptive analysis also reflected a high variability in investments within sectors and company sizes, which coincides with the findings of Birim et al. (2024), who highlight that companies face challenges in the efficient allocation of resources for digital advertising. This reinforces the need for more personalized and optimized strategies.

The results showed that the relationship between social media investment and ROI is very weak ($R^2 = 0.00734$). This suggests that factors other than those considered in this study, such as the quality of advertising strategies or the level of interaction with consumers, could be influencing the results more. This finding is consistent with Lambrecht et al. (2024), who argue that the effectiveness of digital investments is influenced by multiple factors, including consumption patterns and the characteristics of advertising content.

In addition, the commerce sector showed the best results in ROI, especially in medium and small companies, which could be related to the transactional nature of this sector. However, this behavior was not significant enough in the statistical analysis, indicating that the strategies used are not yet optimized. This is in line with the findings of Zhou et al. (2024), who argue that optimizing advertising strategies requires the use of advanced tools, such as machine learning, to improve targeting and maximize returns.

5.1 Implications and Recommendations

Training in digital strategies: Companies, especially micro and small ones, should invest in training on segmentation, content design and use of advanced platforms, as suggested by Bajaj et al. (2024). This could improve the effectiveness of your campaigns and increase ROI.

Adoption of advanced technologies: Incorporating tools such as machine learning and data analytics for campaign optimization is essential, as proposed by Zhou et al. (2024).

Differentiation of strategies by sector: The results suggest that strategies should be adjusted to the context of the economic sector. For example, the services sector could benefit from strategies focused on loyalty and branding, while the commerce sector should prioritize transactional strategies.

Constant ROI evaluation: Following the recommendations of Almestarihi et al. (2024), companies should implement clear metrics and regular reviews to measure and adjust their social media investments.

Although investments in social networks are a key tool for Ecuadorian companies, the results of this study suggest that these investments do not directly translate into a significant ROI. This reinforces the need to design more effective and optimized strategies, taking advantage of emerging technologies and adapting campaigns to the specific characteristics of each sector and company size. These findings provide a solid basis for future research and for the development of policies and programs that strengthen the ability of Ecuadorian companies to compete in a globalized digital marketplace.

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