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Business Management And Competitiveness In The Organizations Of The Popular And Solidarity Economy Of Ecuador

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Abstract

This research aims to determine the relationship between business management and competitiveness, the elements analyzed are the financial indices of liquidity and activity with profitability.

The methodology used correlational analysis, which allowed the development of a Multiple Linear Regression model, with financial indicators of liquidity, activity and economic profitability. The sample consisted of 464 associations from zone 7 of Ecuador, whose financial structure is similar.

The main results show that the proposed model is adequate and that it should be considered in the business management of the associations of the Popular and Solidarity Economy of Zone 7.

The conclusions determine that the analysis of the multiple linear regression model Profitability = Liquidity + Activity, dependent and independent variables respectively, allows to ratify that business management has a correlation with competitiveness from the dimension of financial management. In addition, with the research, the authors contribute with the science regarding Business Management in the Associations of the Popular and Solidarity Economy of Zone 7 of Ecuador.

Keywords: Popular and Solidarity Economy, Business Management, Competitiveness, Financial Management, Economic Profitability, Associations.

Introduction

Currently, companies are in an economic business context, such as globalization, high degree of competitiveness, evolution of new technologies, and complex and unpredictable environments; A fast-changing, continuously independent environment that requires organizations to adapt for sustained economic survival. Faced with this challenge, which is the need to compete successfully in a globalized economy, modern companies need to design strategies to ensure their viability and permanence in the long term.

For this, Business Management (GE) is the key to maintaining an open attitude towards change and constant improvement, this implies the taking of appropriate measures and tactics to increase the productivity and competitiveness of companies, that is, its mission is to establish that organizations are economically viable.

So, GE has among its objectives the creation or generation of advantages, and this is where its relationship with competitiveness is focused. That is, while the objective of business management is to obtain competitive advantages, possessing it leads to increased competitiveness.

For this reason, the objective of this research is to analyze GE from the financial dimension and its relationship with competitiveness based on the economic profitability of associative organizations of the EPS in Zone 7 of Ecuador.

The scope of competitiveness will depend on the GE and its relationship between them, so these variables were investigated in the context of the EPS Organizations with specificity in Ecuador.

The organizations of the EPS include the community, associative and cooperative sectors, in addition to the Popular Economic Units; all these with legal personality, in accordance with the laws and regulations of Ecuador. In addition, in the knowledge that, at the global level, the industrial sector is considered a strategic axis for the economic and social development of any country, because it generates important contributions to GDP and also concentrates a large percentage of the labor force (Chamba-Rueda et al., 2018).

The present research argues that GE is strongly related to the competitiveness of companies, in this case of EPS organizations, with this is demonstrated with more evidence and with it, it collaborates with the construction of solid bases so that management processes become a priority element in the development and strengthening of companies or organizations already mentioned. These processes can be configured in singular theoretical models for organizations such as Popular and Solidarity Economy.

According to the analysis of previous studies by Gómez-García et al. (2021), four groups of financial indicators have been identified, such as: liquidity, activity, indebtedness and profitability, however, the indicators of rotation and capital structure are not considered, the latter reason why the economic structure of cooperative organizations differs from the organizations of the study (associations). Below are the financial indicators analyzed:

Table 1 Financial ratios

Classification	Code	Formula
Liquidity	LG	Current assets/current liabilities
	LI	Current cash/liabilities
	UAC	Net working capital/total assets

	CTN	Current assets – current liabilities
	ACAT	Current assets / total assets
	ACANC	Current assets / non-current assets
	ROTAT	Sales / total assets
Activity	VAC	Sales / current assets
	VPT	Sales / total liabilities
	ROTCS	Sales / share capital
	ENDT	Total liabilities / total assets
Indebtedness	CALD	Current liabilities / total liabilities
	RDPAT	Total liabilities / equity
	D	Net income / total assets
Profitability	RF	Net income / equity
	UNPT	Net income / total liabilities
	RSV	Net Income / Sales

Note: Data taken from Gómez et al.(2018)

In this research he presents the importance in relation to the strengthening of organizations through GE and competitiveness, as well as the relationship aimed at developing together, as factors for financial sustainability.

Materials and methods

To begin the approach of the research, a documentary review was carried out (state of the art), such as the indexed journals Scopus, also with the help of the search equation on the investigations and articles related to the subject raised that would allow to inform about the advances achieved, methodologies used and the results found, with this the bases that guide the purposes to carry out the research were structured. Thus, a first review has allowed to select some research at international and national level, which describes the theme of Popular and Solidarity Economy (EPS), Business Management, Competitiveness, Associative Organizations.

As a result of this process, 72 papers were obtained, of which there were coincidences or repetitions, for this reason an additional exclusion process of 40 papers was carried out, through

the R-estudio software, leaving a final base of 32 in relation to the keywords that are intended to be studied in this research. In the present research, a quantitative approach was applied that involved the collection, analysis and interpretation of data necessary for the study; The research design was non-experimental, which is why the phenomena were observed in their original state and then analyzed. The methods applied were descriptive and correlational, the first gave way to the identification, exploration and analysis of information secondary sources of the EPS organizations, which provided financial data of main accounts reported by the organizations of the Non-Financial sector of type associations, cooperatives and community of the Balance Sheet and Income Statement of the year 2019. (Popular and Solidarity Economy Statistics [EEPS], 2023).

The correlational analysis allowed the development of a Multiple Linear Regression model, which adopts financial indicators and economic profitability, to improve business management.

The type of sampling was non-probabilistic and the sample was selected at the discretion of the researchers, since there were limitations when requesting the information from the government entity Superintendence of the Popular and Solidarity Economy (SEPS), and then perform the treatment and analysis both financial and statistical through the R-Studio software version 4.1.3.

The financial database for the year 2019 was of 4793 observations contained in 19 variables subsequently one variable is eliminated, leaving 10 variables of character type, and 8 numerical variables of the main accounts of the financial statements such as the Financial Position Statement and Income Statement reported to the SEPS. The information was then disaggregated to the Association-type organizations of Zone 7 Loja, El Oro and Zamora Chinchipe, since their financial structure differs from those of the Cooperatives and Community types, and they are representative at the national and zonal levels; Having:

Table 2 Associations in zone 7

Province	Type of organization	Number	Participation
Gold	Association	217	46.77 %
Loja	Association	162	34.91 %
Zamora Chinchipe	Association	85	18.32 %
Total		**464**	**100 %**

Note: Data taken from Popular and Solidarity Economy Statistics Popular and Solidarity Economy Statistics (2023)

46.77% of the data belong to the province of El Oro, 34.91% represents the province of Loja, and 18.32% to the

province of Zamora Chinchipe of the total associations considered in the sample.

Once the sample was determined, the financial indices were defined, as follows:

Table 3 Financial indices for analysis

Classification	Code	Formula	Remarks
Liquidity	LG	Current assets/current liabilities	
	UAC	Current assets – current liabilities	464
	ACAT X2	Current assets / total assets	464
Activity	ROTAT X3	Sales / total assets	464
	VAC	Sales / current assets	464
	VPT	Sales / total liabilities	464
Indebtedness	ENDT X6	Total liabilities / total assets	464
	CALD	Current liabilities / total liabilities	464
	RDPAT X8	Total liabilities / equity	464
	ECPP X9	Total liabilities / equity*100	464
Profitability	RE AND	Net income / total assets	464
	RF Y1	Net income / equity	464
	UNPT	Net income / total liabilities	464
	RSV	Net Income / Sales	464

The table above describes all possible indicators with the combination of the original variables, since for the construction of a multiple linear regression model the financial indicators of liquidity, activity, indebtedness and profitability are considered.

The second method for analysis is correlation, the statistical method Multiple Linear Regression was used, as stated by James et al., (2013) this model supports creating a correlation between a dependent variable (Y) and independent variables (X1,..... Xk), in the research profitability is determined as a dependent variable while the independent variable is considered

to the indicators of liquidity, activity and indebtedness. For this statistical analysis, RStudio software version 4.1.3 was used.

This equation represents a multiple regression model:

Yi=(β0 β1X1i β2X2i ⋯ βnXni) ei

The theoretical model of multiple linear regression proposed in the above equation is defined as follows:

β0: is the value of the dependent variable Y at the origin of the ordinate when all predictors are zero.

βi: Average effect of an increase of one unit in the predictor variable Xi on the dependent variable Y, keeping the other variables constant. These are called partial regression coefficients.

EI: is the residual or error, the difference between the observed value and the model estimate.

Outcome and Discussion

For the analysis we considered the types of organizations of the Association form of the province of Zone 7 excluding cooperatives and community organizations, since they are different in their financial structure. For this research, it was proposed to perform a multiple linear regression model of Economic Profitability (ROA) from the total variables and then define the model according to the techniques applied in the following steps:

1. Linear relationship of variables two by two.

We proceed to elaborate the correlation matrix, through the Pearson method, with a confidence level of 95% confidence and margin of error of 5%, that is, with an alpha of 0.05. For the elaboration of the prediction model, the variables of economic profitability, liquidity, activity and indebtedness are considered.

Table 4 Financial Index Correlation Matrix

	Profitability	Liquidity	Activity	Indebtedness
Profitability	1.0000000	0.2742265	0.5761578	0.1400704
Liquidity	0.2742265	1.0000000	0.2404223	0.1786336
Activity	0.5761578	0.2404223	1.0000000	0.3616933
Indebtedness	0.1400704	0.1786336	0.3616933	1.0000000

Source: Data processed from Popular and Solidarity Economy Statistics (2023)

Elaboration: Juan Gabriel Vacacela Pineda

This relationship was also made graphically between the independent variables with the response variable.

Figure 1 Profitability and Liquidity Ratio

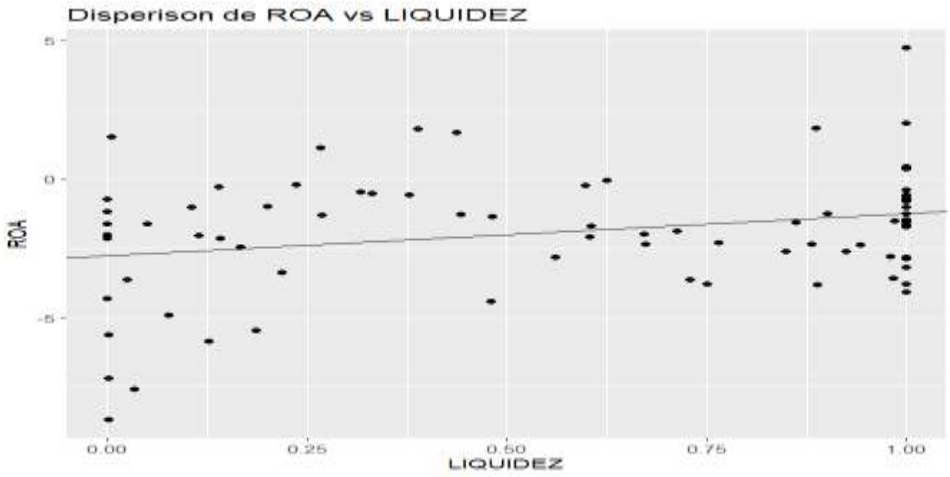


Figure 2 Relationship of Profitability and Activity

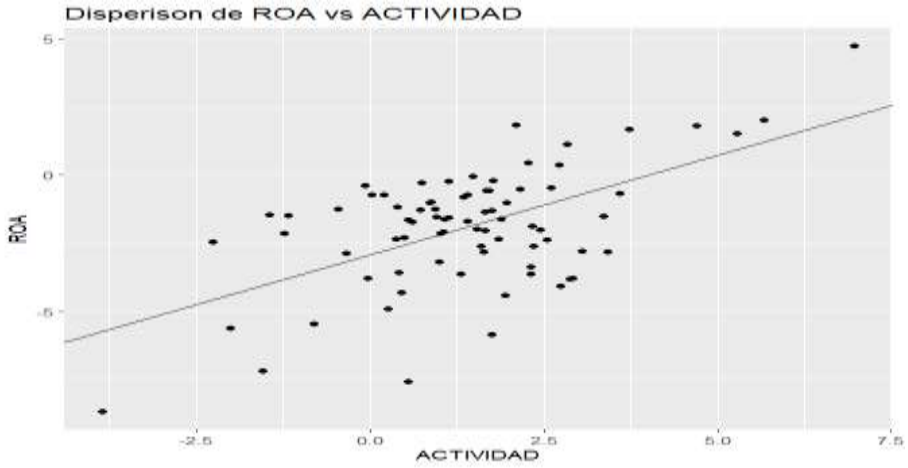
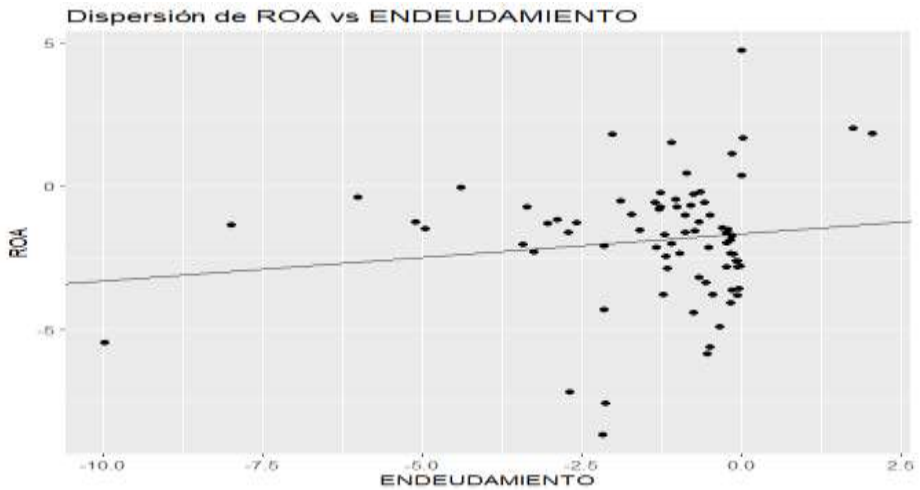


Figure 3 Profitability and Indebtedness Ratio



From the above analysis it can be observed:

The variables with a more linear relationship with financial performance are: activity (r = 0.57), liquidity (r = 0.27) and liabilities (r = 0.14). Activity and debt are moderately correlated (r = 0.36), so it may not be necessary to include these predictors in the model.

Build the model

For the model of the present research, a mixed method was applied, which consists of including all variables as predictors.

model<-lm (ROA~Liquidity+Activity+Indebtedness)

The model with all the variables introduced as predictors has a mean R2 (0.3592), it is able to explain 35.92% of the variability observed in economic profitability.

The p-value of the model is significant (0.0000002995), so it can be accepted that the model is not by chance, at least one of the partial regression coefficients is different from 0. Many of them are not significant, which is an indication that they might not contribute to the model.

2. Analysis of model residuals

Figure 4

Model residual histogram

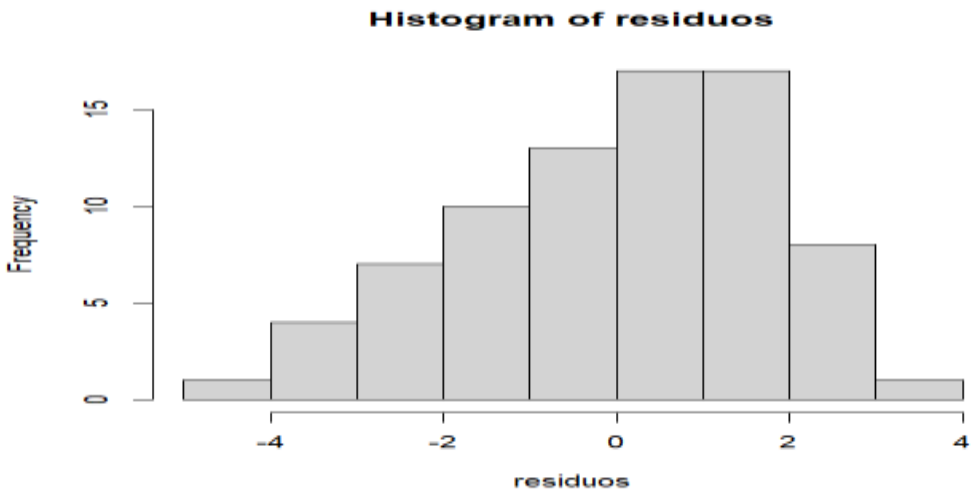
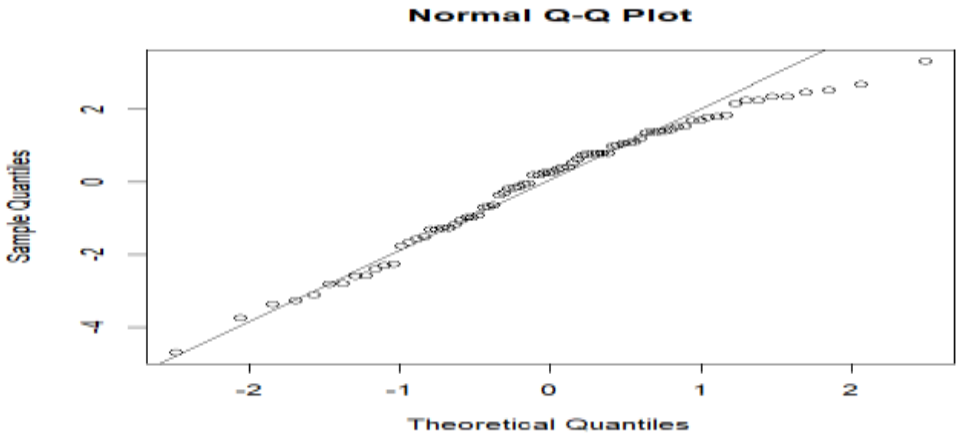


Figure 5 Normality of waste



H0= Normality in waste

H1= Non-normality in waste

According to the graphical analysis and the normality test, p = 0.08302, that is, it is greater than 0.05, which means that there is normality in the residuals of the model.

3. Selecting the best predictors

A mixed step-by-step strategy was used to select the best predictors, and the mathematical value used to determine the quality of the model was that of Akaike (AIC).

The best model resulting from the selection process was:

model1<-lm (formula = ROA ~ Liquidity + Activity)

In model 1 according to the method the variables introduced as predictors has a mean R2 (0.3515), it is able to explain 35.15% of the variability observed in economic profitability.

The p-value of the model is significant (0.00000008842), so it is assumed that the model is not random and has at least a nonzero partial regression coefficient.

For this Model 1, it is recommended to show the confidence intervals for each partial regression coefficient:

Table 5 Confidence intervals

	2.5 %	**97.5 %**
Intercept	-4.0439912	-2.5610230
Liquidity	-0.2596014	1.8572572
Activity	0.4443778	0.9280158

4. Analysis of the residuals of the chosen model:

Figure 6 Histogram residuals model 1

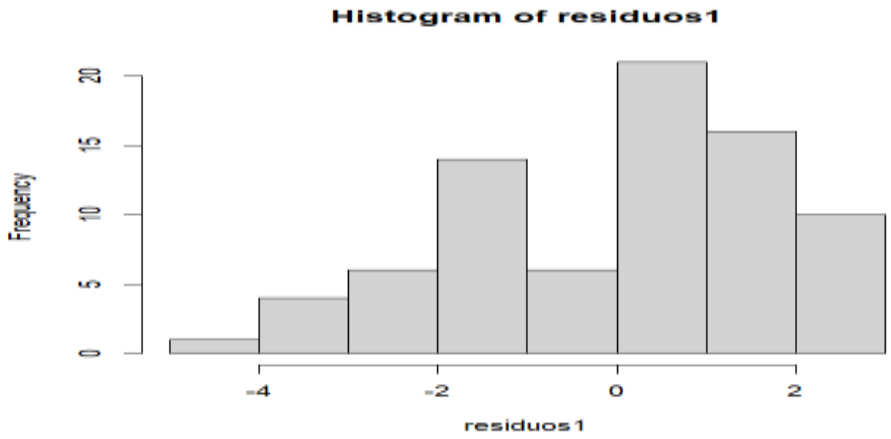
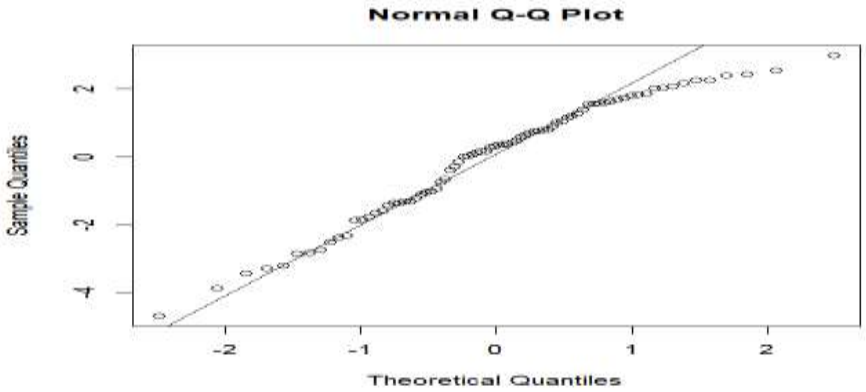


Figure 7 Normality of waste



H0= Normality in waste

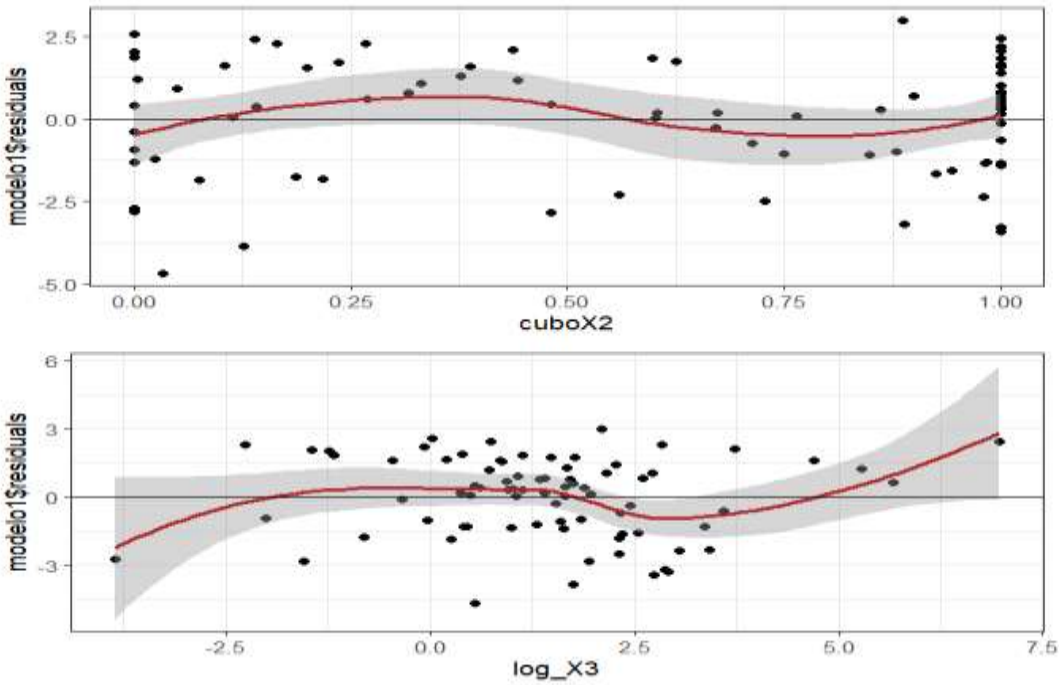
H1= Non-normality in waste

According to the graphical analysis and the normality test, p = 0.02143, that is, it is less than 0.05, which means that there is evidence to reject the null hypothesis, so there is no normality in the residuals of model 1.

5. Validating conditions for linear multiple regression

Linear relationship between numerical predictors and response variable:

Figure 8 Linearity of predictors

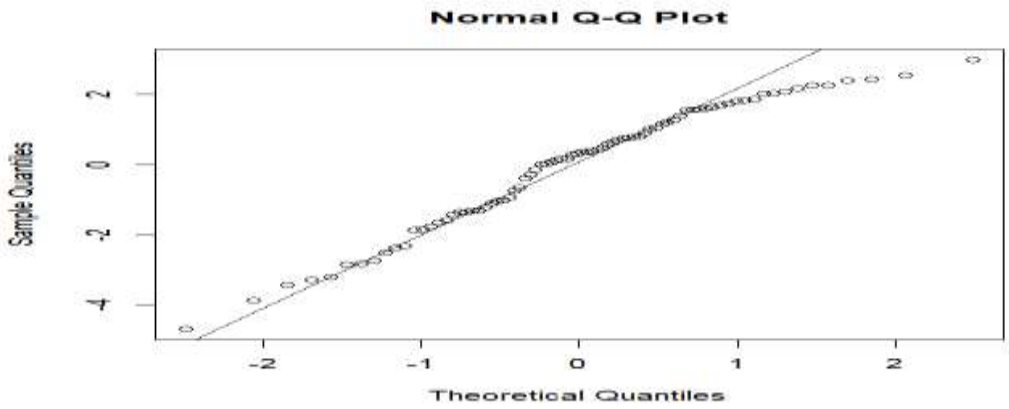


This condition can be tested using a scatter plot between the dependent variable and each predictor variable (as was done in the primary analysis) or a scatter plot between each predictor variable and the model residuals. If the relationship is linear, the residuals must be randomly distributed around 0 with constant variation along the x-axis. The last option is usually more indicative, since it allows us to identify possible deviations:

From the graph above it can be visualized that the linearity is met for all predictors and outliers are not displayed

Normal distribution of waste

Figure 9 Normality of waste



For the analysis of the normality of the model, it proposes the following hypotheses with a significance level of 5% and with a confidence level of 95%

Ho= the model follows a normal distribution

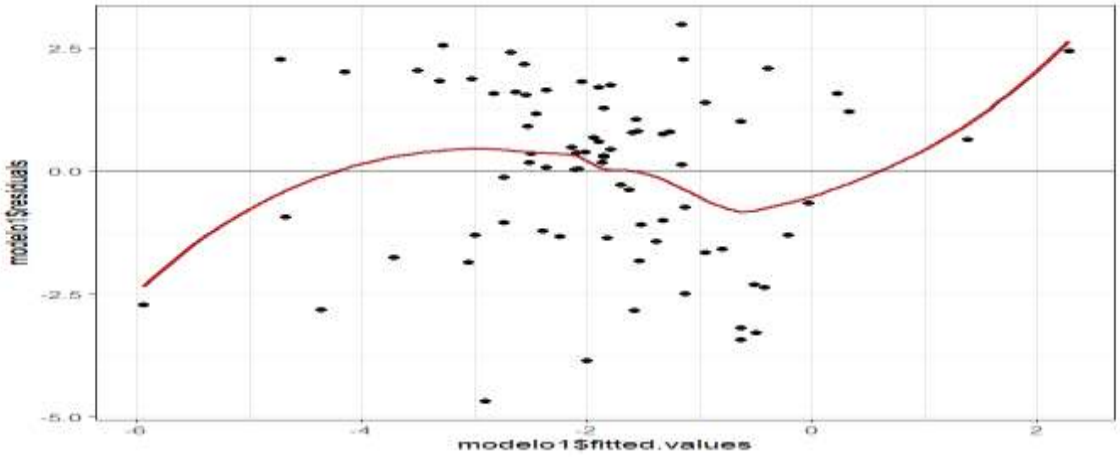
Hi= the model does not follow a normal distribution

For the present research, the Kolmogorov-Smirnov test of normality recommended for > 50 observations, which in our case are 78, was applied.

Both in the graphical analysis normality is confirmed, while in the test the p-value is < 0.02143

Constant variability of residues (homoscedasticity):

Figure 10 Homoscedasticity of the model



When residuals are plotted against the adjusted values in the model, they must be randomly distributed around zero, with about the same variability along the x-axis. For example, if a certain pattern is observed, in extreme cases it will form a cone or a larger dispersion, which means that the variability depends on the adjusted values, so there is no homoscedasticity.

Additionally, the Breusch-Pagan test was used to determine homoscedasticity: BP = 2.0571, df = 2, p-value = 0.3575, so it is evident that there is no lack of homoscedasticity.

Non-collinearity

Figure 11 Correlation matrix between predictors

The correlation between variables is 0.24, which means that there is a positive correlation between the predictors.

Analysis of Variance Inflation (VIF):

Liquidity Activity

1.061349 1.061349

There are no predictors that show a very high linear correlation or variance inflation.

Autocorrelation:

lag Autocorrelation D-W Statistic p-value

1 0.005108717 1.966086 0.88

Alternative hypothesis: rho != 0

Ho= No autocorrelation

Hi= There is homoscedasticity

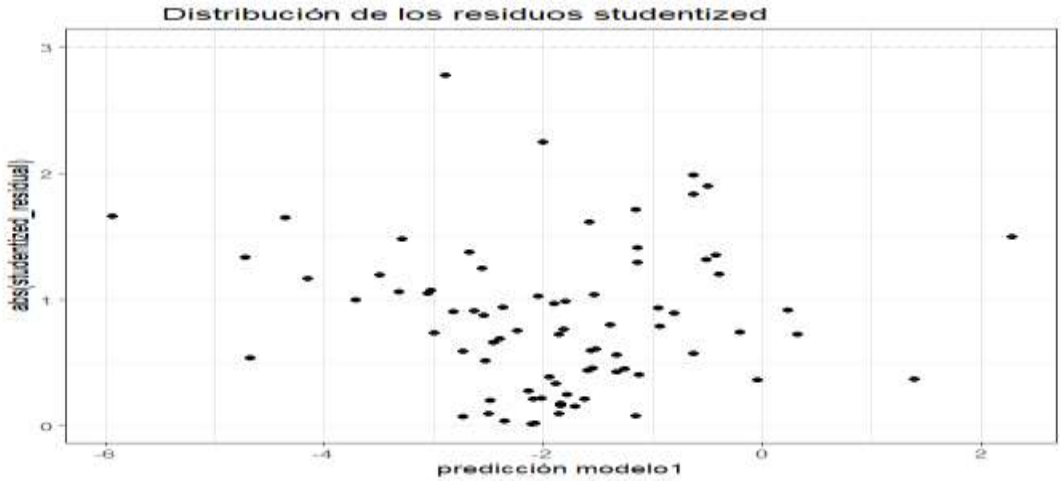
According to the analysis there is no evidence to conclude that there is autocorrelation

Sample size:

There is no specific requirement for the minimum number of observations, but if a variable has a large effect when it actually has a small effect, it is recommended that the number of observations be 10 to 20 times the number of predictor variables. This study must have at least 20 observations and 78 observations are available to be considered eligible.

Identification of potential outliers or influencers

Figure 12 Outliers



No atypical observations were identified

Table 6 Influential data

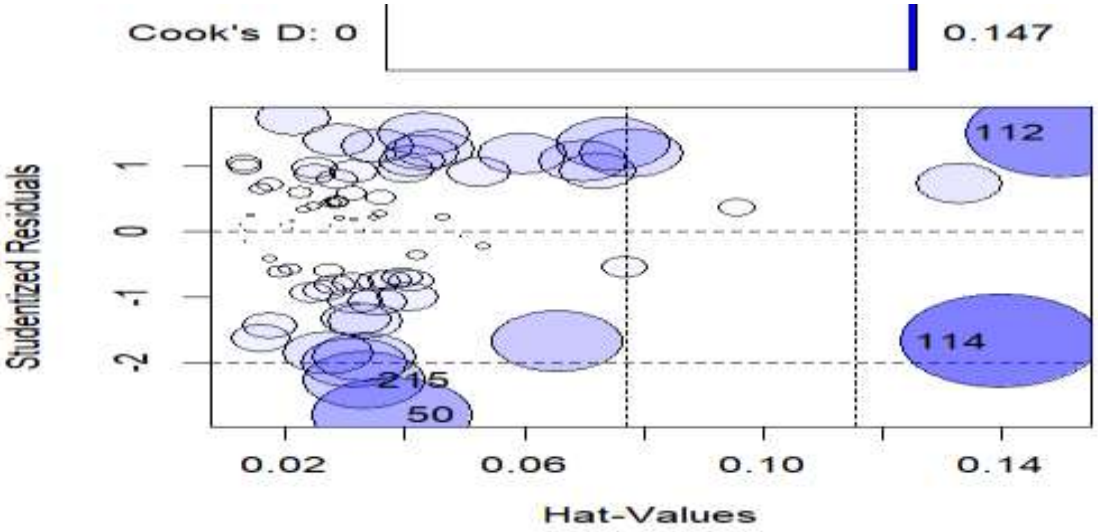
Obs.	dfb.1_	dfb.cb_ (Liquidity)	dfb.l_ (Activity)	dffit	cov.r	cook.d	Hat
50	-0.54	0.42	0.05	-0.55	0.80_*	0.09	0.04
112	-0.21	0.06	0.57	0.63_*	1.12	0.13	0.15_*
114	-0.49	0.15	0.57	-0.67_*	1.08	0.15	0.14_*
193	0.09	-0.18	0.24	0.29	1.18_*	0.03	0.13_*
209	-0.04	0.02	0.10	0.12	1.14_*	0.00	0.10

Table 6 contains observations (one column for each predictor) that significantly affect at least one predictor. The last three columns are 3 different measures to quantify impact. Please consider the following as a guide.

- Leverage (cap): observations with a cap value greater than 2.5((p 1)/n), where p is the number of predictors and n is the number of observations, are considered influential observations.
- Cooking distance (cook.d): values greater than 1 are considered influential.

A graphical representation of the effect is as follows:

Figure 13 Influential data



The analysis revealed several influential observations (positions 50, 112, 114 and 215), although they did not exceed leverage limits or Cook distance values. Deeper analysis can rethink patterns and explore their implications without influential observations.

Conclusions

This study concludes that there is a positive relationship between financial indices, i.e. financial management and profitability. Through the management of liquidity and activity are closely related, the greater liquidity and activity, the greater the profitability of the EPS associations.

The results of the statistical analyses conclude that the multiple line regression model is adequate, for future research influential data should be excluded for an analysis, this would represent generating another multiple linear regression model with its respective validation analyses.

The associations of the EPS, must consider business management strategies based on financial indicators to achieve greater profitability and this leads them to a competitive level within the market.

References

Chamba-Rueda, L.-M., Higuerey, A., Pardo-Cueva, M., & Rios-Zaruma, J. (2018). Quality factors and their impact on the business performance in the Ecuadorian manufacturing sector-Loja. 2018 13th Iberian Conference on Information Systems and Technologies (CISTI), 1-6. https://doi.org/10.23919/CISTI.2018.8399467

Popular and Solidarity Economy Statistics. (2023a, March 29). https://estadisticas.seps.gob.ec/index.php/estadisticas-eps/

Popular and Solidarity Economy Statistics. (2023b, March 29). https://estadisticas.seps.gob.ec/index.php/estadisticas-eps/

Gómez, M., Zambrano, I., & Rosales, A. (2018). Mathematical model of a planar four-link mechanism for motion of the cruciate ligaments of the knee joint; And validation of the model using video analysis. IEEE Ecuador Tech. Chapters Meet., ETCM, 2017-January, 1-6. Scopus. https://doi.org/10.1109/ETCM.2017.8247479

Gómez-García, S. L., Leyva-Ferreiro, G., Murillo-Mora, M. K., & Reyes-Espinosa, M. V. (2021). Financial indicators predicting failure in transport service cooperatives in the Portoviejo Canton (Ecuador). Revista Venezolana de Gerencia, 26(6), Article 6. https://doi.org/10.52080/rvgluz.26.e6.39

James, G., Witten, D., Hastie, T., & Tibshirani, R. (2013). An Introduction to Statistical Learning.

Annex 1 Scopus search equation:

Date	Rank	Equation
23.03.2023	2013-2023	(TITLE-ABS-KEY ({popular and solidarity economy})
23.03.2023	2013-2023	(TITLE-ABS-KEY ({popular and solidarity economy}) AND TITLE-ABS-KEY ({business management}) OR TITLE-ABS-KEY ({competitiveness}) OR TITLE-ABS-KEY ({partnerships}) OR TITLE-ABS-KEY ({cooperatives}) OR TITLE-ABS-KEY ({community}))
23.03.2023	2013-2023	(TITLE-ABS-KEY ({popular and solidarity economy}) AND TITLE-ABS-KEY ({business management}) or title-abs-key ({competitiveness}) OR TITLE-ABS-KEY ({associative sector}) OR TITLE-ABS-KEY ({community sector}) OR TITLE-ABS-KEY ({cooperative sector}))
23.03.2023	2013-2023	(TITLE-ABS-KEY ({popular and solidarity economy}) AND TITLE-ABS-KEY ([business AND management]) OR TITLE-ABS KEY ([competitiveness]) OR TITLE-ABS-KEY ([associative AND sector]) OR TITLE-ABS-KEY ([community AND sector]) OR TITLE-ABS-KEY ([cooperative AND sector]))
23.03.2023	2013-2023	(TITLE-ABS-KEY ({popular and solidarity economy}) AND TITLE-ABS-KEY ([business AND management]) OR TITLE-ABS-KEY ([competitiveness]) OR TITLE-ABS-KEY ([partnerships]) OR TITLE-ABS-KEY ([cooperatives]) OR TITLE-ABS-KEY ([community]))

Annex 2

Exclusion of papers:

Process	R-Studio Code
We join df equal columns, rows are repeated	Datafin <- rbind (scopus_1, scopus_2, scopus_3, scopus_4, scopus_5, scopus_6) Duplicated(DataFin)
Delete repeating titles or rows that are the same	Datafin. unique <- unique(datafin)
I check for duplicates in the final df	duplicated (datafin. unique)

Annex 3 Codes in R-studio

Activity	Code in R
Correlation matrix	matriz_cor <- cor(data_BoxCox, method = "pearson") matriz_co
Figure 1: Relationship of Profitability and Liquidity	ggplot(data = data_BoxCox, aes(x=cubeX2, y=log_Y))+ geom_point()+ geom_abline(intercept = lm(log_Y~cuboX2, data=data_BoxCox)$coefficients[1], slope = lm(log_Y~cuboX2, data = data_BoxCox)$coefficients[2])+ labs(title = "Disperison de ROA vs LIQUIDITY", x = "LIQUIDITY", y= "ROA"
Graph 2: Relationship of Profitability and Activity	ggplot(data = data_BoxCox, aes(x=log_X3, y=log_Y))+ geom_point()+ geom_abline(intercept = lm(log_Y~log_X3, data=data_BoxCox)$coefficients[1], slope = lm(log_Y~log_X3, data = data_BoxCox)$coefficients[2])+ labs(title = "ROA vs ACTIVITY Experience", x = "ACTIVITY", y= "ROA")