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THE TRANSFORMATIVE IMPACT OF SOCIAL ENTREPRENEURS ON TERRITORIAL ECONOMIC DEVELOPMENT: AN EMPIRICAL ANALYSIS OF AGRICULTURAL COOPERATIVES IN MARRAKECH-SAFI REGION USING BINARY LOGISTIC REGRESSION

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A B S T R A C T

This study examines how individual characteristics of social entrepreneurs influence territorial economic development in Morocco's Marrakech-Safi region. Using binary logistic regression analysis, we investigated personality traits, motivations, and competencies of 100 social entrepreneurs operating in agricultural cooperatives engaged in livestock farming, beekeeping, and local product commercialization. Data were collected through semi-structured questionnaires and analyzed using SPSS version 25. Results demonstrate significant positive relationships between entrepreneurial characteristics and regional development. Personality traits ($\beta=8.248$, $p<0.05$), intrinsic and extrinsic motivations ($\beta=2.403$, $p<0.05$), and cognitive, relational, and functional competencies ($\beta=4.486$, $p<0.05$) significantly impact performance. The model exhibits strong predictive power (adjusted $R^2=0.896$) with high reliability (Cronbach's $\alpha=0.872$). Statistical tests confirm robust associations (Chi-Square $p=0.000$; Cramer's $V=0.710$-0.840). These findings provide actionable insights for policymakers to design targeted support mechanisms, favorable policies, and strategic partnerships that foster sustainable social entrepreneurship and territorial economic development in developing regions.

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1. INTRODUCTION

Social entrepreneurship has emerged as a powerful driver of economic, social, and societal transformation worldwide, representing a dynamic approach to addressing urgent global challenges including climate change, poverty, education, and unemployment (Dees, 2018; Lapin, 2024; Moutard-Martin, 2024). In Morocco, significant efforts have been undertaken to foster social entrepreneurship and promote sustainable development,

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particularly through the National Initiative for Human Development (INDH) launched in 2005 (Boulkhir et al., 2024c; Choudhary, 2023; Hmama, 2022). Despite these initiatives, the determinants influencing social entrepreneurs' performance in Morocco remain insufficiently studied.

Many social entrepreneurs operate in contexts marked by substantial obstacles, including limited resource access, insufficient institutional support, and cultural and economic constraints (Azhana et al., 2024; Boulkhir & Touhami, 2024b; Hmama, 2022). Understanding what motivates these entrepreneurs, how their personality traits influence their actions, and what competencies are necessary for success is essential for designing effective support mechanisms. Mair and Martí (2006) demonstrated that institutional contexts significantly shape opportunities and obstacles for social entrepreneurs, while Boulkhir et al. (2024a) emphasized the critical role of individual characteristics in the Moroccan context. This research addresses this gap by examining the personality traits, motivation, and competencies of social entrepreneurs and their role in territorial economic development. Understanding how individual characteristics such as openness to experience, resilience, and innovation capacity can promote both personal success and community prosperity is critical (Lapin, 2024; Santos, 2012; Zahra et al., 2009). We also investigate how intrinsic and extrinsic motivations influence performance, as Ryan and Deci (2000) demonstrated that intrinsic motivation is associated with higher performance and satisfaction across various contexts.

Our study focuses specifically on the Marrakech-Safi region, examining how social entrepreneurs' creativity and social commitment promote socioeconomic inclusion and strengthen social cohesion. Their individual characteristics, often underestimated, significantly influence their ability to propose innovative solutions to social problems (Boulkhir & Touhami, 2024b; Santos, 2012). This leads to our central research question: To what extent do the individual characteristics of social entrepreneurs contribute to territorial economic development in the Marrakech-Safi region?We employ a quantitative, post-positivist approach using binary logistic regression to investigate relationships between personality traits, motivation, competencies, and territorial economic development indicators including revenue generation, job creation, customer satisfaction, and environmental protection. Baron and Tang (2011) demonstrated that entrepreneurial competencies are essential for success in uncertain and complex environments, a finding particularly relevant to the Moroccan context (Boulkhir et al., 2024a).

This article is structured as follows: Section 2 presents the theoretical framework examining individual determinants of social entrepreneurs. Section 3 describes the empirical context and methodology adopted. Section 4 presents our analytical results. Section 5 concludes by synthesizing main implications and offering recommendations for practitioners, policymakers, and researchers interested in fostering social entrepreneurship's role in territorial economic development in Morocco.

2. THEORETICAL FRAMEWORK: INDIVIDUAL DETERMINANTS OF SOCIAL ENTREPRENEURS

Social entrepreneurship is the process through which individuals create or transform organizations, structures, or regimes to address social and environmental issues (Dees, 2018; Lapin, 2024). However, social entrepreneurs vary considerably in their effectiveness and efficiency in contributing to territorial economic development. Multiple factors influence their capacity to create social and economic impact, including institutional context, business model, governance, and partnerships (Mair & Martí, 2006; Santos, 2012). Among these factors, individual characteristics personality traits, motivation, and competencies are consistently identified as key elements explaining entrepreneurial behavior, choices, and outcomes (Baron & Tang, 2011; Boulkhir et al., 2024c; Zahra et al., 2009).

Table 1. Theoretical Frameworks of Individual Determinants of Social Entrepreneurs

Determinant	Theoretical Framework	Key Dimensions	Key References
Personality Traits	Big Five Model	Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experience	Boulkhir et al. (2024a); Choudhary (2023); de Bruin et al. (2023); Lapin (2024)
Motivation	Self-Determination Theory	Intrinsic Motivation (autonomy, competence, relatedness); Extrinsic Motivation (rewards, recognition)	Boulkhir & Touhami (2024c); Ryan & Deci (2000); Smith et al. (2013)
Competencies	Boyatzis' Competency Model	Cognitive Skills (reasoning, creativity); Relational Skills (communication, leadership); Functional Skills (technical, managerial)	Baron & Tang (2011); Corner & Ho (2010); Morris et al. (2022)

Source: Compiled by authors from literature review

Understanding these individual determinants is essential for maximizing social entrepreneurs' effectiveness and impact. Better comprehension of these factors enables development of appropriate support and training strategies, helping social entrepreneurs overcome obstacles and optimize their potential in achieving economic and social goals (Boulkhir & Touhami, 2024e; Lapin, 2024; Zahra et al., 2009). Table 1 synthesizes the main theoretical frameworks and key findings regarding individual determinants of social entrepreneurs, presenting the three principal models employed in this study: the Big Five personality model, self-determination theory, and Boyatzis' competency model.

2.1 Personality Traits of Social Entrepreneurs and Territorial Economic Development

This subsection examines the relationship between social entrepreneurs' personality traits and their influence on territorial economic development. The Big Five personality model, as presented in Table 1, provides a comprehensive framework for measuring five fundamental personality dimensions: conscientiousness, extraversion, agreeableness, emotional stability (neuroticism reversed), and openness to experience (Boulkhir et al, 2024c; de Bruin, Teasdale, & Roy, 2023). Social entrepreneurs, characterized by their orientation toward solving social or environmental problems while generating income, tend to exhibit elevated levels across multiple dimensions including autonomy desire, self-efficacy, conscientiousness, extraversion, agreeableness, openness to new experiences, proactive personality, and innovation disposition (Choudhary, 2023; Lapin, 2024).

These personality traits reflect social entrepreneurs' capacity to demonstrate creativity, take initiative, manage uncertainty, collaborate with stakeholders, establish ambitious goals, maintain self-belief, confront challenges, operate autonomously, anticipate opportunities, and innovate for collective benefit (Santos, 2012; Zahra, Gedajlovic, Neubaum, & Shulman, 2009). At the individual level, these characteristics influence decisions to create social enterprises, entrepreneurial intentions, business performance and growth, and entrepreneur satisfaction and well-being. Collectively, these traits contribute to creating social and environmental value, solving social problems, stimulating innovation, promoting inclusion, generating employment and income, and improving community quality of life (Baron & Tang, 2011; Boulkhir & Touhami, 2024b; Mair & Martí, 2006).

However, the literature emphasizes that personality traits are not sole determinants of social entrepreneurial behavior and success. Other variables—including context, enterprise type, development stage, leadership style, motivations, attitudes, emotions, competencies, and networks—also play crucial roles (Ryan & Deci, 2000; Zahra et al., 2009). Therefore, understanding social entrepreneurship's impact on economic development requires a holistic and dynamic approach. Empirical evidence from the Moroccan context supports the positive relationship between personality traits and social entrepreneurial performance (Boulkhir et al., 2024a).

2.2 Social Entrepreneurs' Motivation and Regional Economic Development

This subsection examines driving forces behind social entrepreneurs and their effects on regional economic growth, focusing on intrinsic and extrinsic motivational dimensions. As outlined in Table 1, self-determination theory provides the theoretical foundation for understanding motivation. Motivation, defined as the internal or external force driving individual action, divides into two categories: intrinsic motivation, related to pleasure and personal satisfaction, and extrinsic motivation, influenced by external rewards (Ryan & Deci, 2000). Facing social entrepreneurship's particular challenges, entrepreneurs must leverage their motivation to reconcile social mission with economic viability (Boulkhir & Touhami, 2024e; Lapin, 2024).

The analysis employs self-determination theory, highlighting three essential psychological needs: relatedness (social affiliation), competence, and autonomy (Ryan & Deci, 2000). Empirical studies using quantitative data reveal that intrinsic motivation—characterized by passion, conviction, altruism, and meaning-seeking—yields favorable outcomes on social entrepreneurial performance and impact, including revenue, growth, job creation, customer satisfaction, and social and environmental contributions (Choudhary, 2023; Smith, Gonin, & Besharov, 2013). Conversely, extrinsic motivation—influenced by necessity, opportunity, ambition, and recognition—generally demonstrates negative or neutral impact on social entrepreneurial performance (Mair & Martí, 2006). Thus, literature suggests that intrinsic motivation emerges as an essential determinant of social entrepreneurs' contribution to territorial economic development, while extrinsic motivation exhibits limited or negative impact (Baron & Tang, 2011; Boulkhir & Touhami, 2024b; Zahra et al., 2009).

Recent empirical evidence from the Marrakech-Safi region confirms these theoretical predictions, demonstrating that social entrepreneurs driven primarily by intrinsic motivation achieve significantly higher performance outcomes (Boulkhir & Touhami, 2024d).

2.3 Social Entrepreneurs' Competencies and Regional Economic Development

This subsection explores social entrepreneurial competencies' impact on territorial economic development. Following Boyatzis' competency model presented in Table 1, competencies are categorized into three groups: cognitive, relational, and functional.

Cognitive competencies—encompassing perception, memory, reasoning, problem-solving, and creativity—prove essential for identifying opportunities, designing innovative solutions, and managing complexity (Morris, Webb, & Franklin, 2022). Relational competencies—including communication, negotiation, cooperation, leadership, and empathy—play crucial roles in articulating vision, mobilizing resources, fostering cooperation, and managing stakeholders (Corner & Ho, 2010). Finally, functional competencies—such as accounting, marketing, project management, and sector-specific knowledge—are necessary for effectively handling operational, financial, and strategic aspects (Smith et al., 2013).

Based on Boyatzis' (1982) competency model, which classifies competencies according to their generality and performance linkage, empirical studies using quantitative data demonstrate positive impacts. Results suggest that cognitive, relational, and functional competencies positively impact social entrepreneurial performance, including revenue, growth, job creation, customer satisfaction, and social and environmental contributions (Dees, 2018; Zahra et al., 2009). The integration of these three competency categories enables social entrepreneurs to navigate complex environments effectively, balancing social mission with economic sustainability (Baron & Tang, 2011).

2.4 Research Hypotheses

Based on the theoretical framework and literature review examining individual traits of social entrepreneurs and their contribution to territorial economic development, we formulate three research hypotheses. Table 2 synthesizes these hypotheses, presenting the theoretical foundations, expected relationships, and supporting literature for each hypothesis concerning personality traits, motivation, and competencies.

Table 2. Research Hypotheses and Theoretical Foundations

Hypothesis	Determinant	Theoretical Foundation	Expected Relationship
H_1	Personality Traits	Big Five Model (Boulkhir et al., 2024a; de Bruin et al., 2023)	Positive (+): Extraversion, agreeableness, conscientiousness, emotional stability, and openness positively influence territorial development
H_2	Motivation	Self-Determination Theory (Ryan & Deci, 2000; Boulkhir & Touhami, 2024b)	Positive (+): Intrinsic motivation shows stronger positive effects than extrinsic motivation on territorial development
H_3	Competencies	Boyatzis' Model (Baron & Tang, 2011; Morris et al., 2022)	Positive (+): Cognitive, relational, and functional competencies positively influence territorial development

Source: Developed by authors based on literature review

Based on Table 2, the formal statements of our research hypotheses are as follows:

H_1: The personality traits of social entrepreneurs (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) positively influence their contribution to territorial economic development.

H_2: The intrinsic and extrinsic motivation of social entrepreneurs constitutes a determining factor in their contribution to territorial economic development, with intrinsic motivation demonstrating stronger positive effects.

H_3: The competencies of social entrepreneurs, grouped into three categories (cognitive, relational, and functional competencies), positively influence their contribution to territorial economic development.

These three hypotheses will be empirically tested using binary logistic regression analysis on data collected from 100 social entrepreneurs operating in agricultural cooperatives in the Marrakech-Safi region. The following section describes the research methodology employed to test these hypotheses.

3. METHODOLOGY

This section presents the research methodology employed to empirically test the hypotheses formulated in Section 2. We adopt a quantitative, post-positivist approach using binary logistic regression analysis to examine the relationships between social entrepreneurs' individual characteristics (personality traits, motivation, and competencies) and their contribution to territorial economic development in the Marrakech-Safi region.

This methodological choice is justified by the dichotomous nature of our outcome variable and the need to estimate probability relationships between multiple predictor variables and entrepreneurial performance (Hosmer & Lemeshow, 2000; Nelder & Wedderburn, 1972).

3.1 Research Design and Sample

This study employs a cross-sectional research design with primary data collection through semi-structured questionnaires administered to social entrepreneurs in the Marrakech-Safi region. The target population comprises social entrepreneurs operating in agricultural cooperatives engaged in diverse activities including livestock farming, beekeeping, poultry farming, rabbit breeding, and production and commercialization of

local products such as cereals, dried fruits, dairy products, and aromatic and medicinal plants. The Marrakech-Safi region was selected due to its significant concentration of agricultural cooperatives and its status as a priority region for social entrepreneurship development under Morocco's National Initiative for Human Development (INDH) (Boulkhir et al., 2024a; Hmama, 2022).

The sample consists of 100 social entrepreneurs selected through purposive sampling to ensure representativeness across different cooperative types and provinces within the region. Data collection was conducted over a six-month period from March 2023 to September 2023, allowing sufficient time for comprehensive data gathering and initial validation. The sample size of 100 respondents exceeds the minimum recommended threshold for binary logistic regression analysis, which typically requires at least 10 events per predictor variable to ensure statistical power and model stability (Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996).

3.2 Variables and Measurement Instruments

The operationalization of variables follows established theoretical frameworks and validated measurement instruments. Table 3 presents a comprehensive overview of the study variables, their operational definitions, measurement scales, and theoretical foundations.

Table 3. Variable Operationalization and Measurement

Variable Type	Variable Name	Operational Definition	Measurement Scale
Dependent Variable	Territorial Economic Development Contribution	Composite measure of revenue generation, job creation, customer satisfaction, and environmental protection	Dichotomous (0=Low contribution, 1=High contribution)
Independent Variable 1	Personality Traits (X_1)	Big Five dimensions: Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness	5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree)
Independent Variable 2	Motivation (X_2)	Intrinsic motivation (autonomy, competence, relatedness) and Extrinsic motivation (rewards, recognition)	5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree)
Independent Variable 3	Competencies (X_3)	Cognitive skills (reasoning, creativity), Relational skills (communication, leadership), Functional skills (technical, managerial)	5-point Likert scale (1=Strongly Disagree to 5=Strongly Agree)

Source: Developed by authors based on theoretical frameworks

3.3 Binary Logistic Regression Analysis

Binary logistic regression is a statistical method specifically designed to model the relationship between one or more predictor variables and a dichotomous outcome variable (Hosmer & Lemeshow, 2000). Unlike linear regression, which assumes a linear relationship and normally distributed errors, logistic regression uses the logit link function to ensure predicted probabilities remain bounded between 0 and 1 (Nelder & Wedderburn, 1972). The method is particularly appropriate for this study given our binary outcome variable representing high versus low contribution to territorial economic development Hair, Black, Babin, & Anderson, (2014).

The logistic regression model estimates the probability π that an observation belongs to a particular category (Y = 1, indicating high contribution) based on predictor variables X_1, X_2, and X_3. The model is expressed as:

$$\boldsymbol{logit}(\boldsymbol{\pi}) = \boldsymbol{ln}[\boldsymbol{\pi}/(\mathbf{1}-\boldsymbol{\pi})] = \boldsymbol{\beta}_0 + \boldsymbol{\beta}_1\boldsymbol{X}_1 + \boldsymbol{\beta}_2\boldsymbol{X}_2 + \boldsymbol{\beta}_3\boldsymbol{X}_3$$

where π represents the probability of high contribution, β_0 is the intercept, and β_1, β_2, β_3 are regression coefficients representing the effects of personality traits, motivation, and competencies respectively. The logit transformation allows modeling of non-linear relationships while maintaining probabilistic interpretations (Menard, 2002). The implementation of binary logistic regression in this study follows six methodological steps, as outlined below and synthesized in Table 4.

Each step in Table 4 was rigorously implemented in this study to ensure methodological robustness and validity of findings. Data preparation involved systematic screening for missing values (< 5% observed), outlier detection using standardized residuals, and verification of data entry accuracy.

The dichotomous outcome variable was constructed through a composite scoring system integrating four performance indicators, with entrepreneurs scoring above the median classified as high contributors (coded 1) and those below as low contributors (coded 0), following Bernoulli distribution assumptions (Agresti, 2013).

Model specification employed the logit link function within a generalized linear model framework, establishing the functional relationship between predictor variables and the log-odds of the outcome (Nelder & Wedderburn, 1972). The three predictor variables—personality traits, motivation, and competencies—were entered simultaneously into the

model to assess their independent and collective effects while controlling for intercorrelations. Maximum likelihood estimation was conducted using SPSS version 25, employing iterative Newton-Raphson algorithms to converge on optimal parameter estimates that maximize the log-likelihood function (Cox & Snell, 1989). Model evaluation incorporated multiple fit indices to comprehensively assess model quality. The omnibus Chi-Square test evaluated overall model significance compared to a null model ($p < 0.05$ indicating significant improvement). The Hosmer-Lemeshow goodness-of-fit test assessed calibration between observed and expected frequencies across deciles of predicted probabilities ($p > 0.05$ indicating acceptable fit). Pseudo R^2 measures (Cox & Snell R^2 and Nagelkerke R^2) estimated the proportion of variance explained, while the Akaike Information Criterion (AIC) facilitated model comparison (Burnham & Anderson, 2004; Hosmer & Lemeshow, 2000).

Model interpretation focused on the substantive meaning of regression coefficients (β) and their exponentiated forms (odds ratios = exp(β)). Each β coefficient represents the change in log-odds of high contribution associated with a one-unit increase in the predictor variable, holding other variables constant. Odds ratios provide more interpretable effect sizes, indicating the multiplicative change in odds for each unit increase in predictors. Statistical significance of individual predictors was assessed using Wald Chi-Square tests with $p < 0.05$ threshold (Menard, 2002).
Model validation examined predictive accuracy and generalizability through multiple approaches. Classification accuracy was evaluated using the confusion matrix, reporting sensitivity, specificity, and overall correct classification percentage. Receiver Operating Characteristic (ROC) curve analysis quantified discriminatory power, with area under curve (AUC) values above 0.70 indicating acceptable discrimination. Cross-validation procedures assessed model stability and tested for overfitting, ensuring results generalize beyond the sample data (Harrell, 2015).

3.4 Data Analysis Software and Statistical Procedures

All statistical analyses were performed using IBM SPSS Statistics version 25 (IBM Corporation, Armonk, NY). Descriptive statistics (means, standard deviations, frequencies) characterized the sample and study variables. Reliability analysis employed Cronbach's alpha coefficients to assess internal consistency of measurement scales. Correlation analysis examined bivariate relationships between variables using Pearson correlation coefficients. Binary logistic regression constituted the primary analytical technique for hypothesis testing, with significance level set at $\alpha = 0.05$ for all statistical tests. This rigorous methodological approach ensures that findings presented in Section 4 are statistically valid, theoretically grounded, and practically meaningful for understanding how individual characteristics of social entrepreneurs influence their contribution to territorial economic development in the Marrakech-Safi region.Table 4 presents the six methodological steps of binary logistic regression employed in this study, detailing the specific procedures, analytical tools, and evaluation criteria for each step.

Table 4. Six-Step Process of Binary Logistic Regression Analysis

Step	Process	Procedures and Tools	Key References
Step 1	**Data Preparation**	Data cleaning, missing value treatment, outlier detection; Outcome variable coded using Bernoulli distribution (π = probability of success); SPSS v.25 for data organization	Agresti (2013)
Step 2	**Model Specification**	Selection of predictor variables (X_1, X_2, X_3); Specification of logit link function; Generalized linear model framework	Nelder & Wedderburn (1972)
Step 3	**Model Estimation**	Maximum Likelihood Estimation (MLE); Iterative algorithms to maximize log-likelihood; Estimation of β coefficients	Cox & Snell (1989)
Step 4	**Model Evaluation**	Chi-Square test, Hosmer-Lemeshow test; Pseudo R^2 (Cox & Snell, Nagelkerke); AIC for model comparison	Burnham & Anderson (2004); Hosmer & Lemeshow (2000)
Step 5	**Model Interpretation**	Interpretation of β coefficients as log-odds; Calculation of odds ratios exp(β); Assessment of practical significance	Menard (2002)
Step 6	**Model Validation**	Classification accuracy, ROC curve analysis; Cross-validation to assess generalizability; Check for overfitting	Harrell (2015)

Source: Adapted from Hosmer & Lemeshow (2000) and Nelder & Wedderburn (1972)

4. RESULTS AND DISCUSSION

This section presents the results of the empirical analysis examining the relationships between individual characteristics of social entrepreneurs and their contribution to territorial economic development in the Marrakech-Safi region. The presentation follows a systematic structure: first, descriptive characteristics of the study sample and context are provided; second, preliminary statistical tests assess data quality and model assumptions; third, binary logistic regression results test the three research hypotheses; and finally, findings are discussed in relation to theoretical frameworks and prior empirical evidence.

4.1 Sample Characteristics and Empirical Context

The study examines 100 social entrepreneurs operating agricultural cooperatives across the Marrakech-Safi region of Morocco. This region, known for its economic diversity and significant concentration of social entrepreneurial activity, provides an ideal context for investigating the determinants of entrepreneurial contribution to territorial economic development (Boulkhir et al., 2024a). The social entrepreneurs in this sample are engaged in diverse activities addressing both social missions and economic sustainability objectives, including livestock farming, beekeeping, poultry farming, rabbit breeding, production and commercialization of cereals and dried fruits, collection and marketing of milk and dairy derivatives, and harvesting of aromatic and medicinal plants. Data collection was conducted over a six-month period from March 2023 to September 2023, utilizing semi-structured questionnaires administered through face-to-face interviews. This extended timeframe allowed comprehensive observation of social entrepreneurial activities and their impacts on local economic development. Table 5 presents the operationalization of study variables employed in the analysis, while Figure 1 illustrates the geographical distribution of cooperatives across provinces within the Marrakech-Safi region.

Table 5. Study Variables and Operational Definitions

Variable Category	Variables Measured	Data Source
Dependent Variable	Territorial economic development contribution (dichotomous: high/low)	Primary data (questionnaire)
Independent Variables	Personality traits (X_1), Motivation (X_2), Competencies (X_3)	Primary data (questionnaire)
Contextual Data	Cooperative activities, performance indicators, geographical distribution	Primary and secondary data (records, reports, databases)

Source: Authors' compilation from data collection instruments

As illustrated in Figure 1, the distribution of cooperatives across the eight provinces of Marrakech-Safi demonstrates considerable geographical variation, with the highest concentrations in provinces with established agricultural infrastructure and INDH support programs. This spatial distribution reflects differential levels of social entrepreneurial ecosystem development across the region.

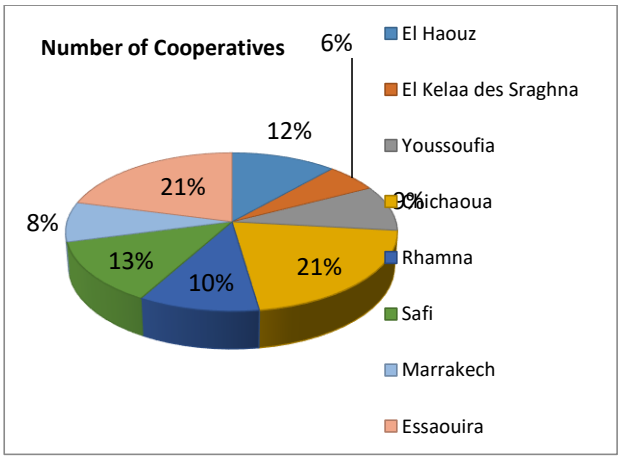

Figure 1. Distribution of agricultural cooperatives by province in Marrakech-Safi region

4.2 Preliminary Statistical Tests and Model Diagnostics

Prior to conducting the binary logistic regression analysis, several preliminary statistical tests were performed to assess data quality, verify measurement reliability and validity, and examine preliminary relationships between variables. These tests include reliability assessment using Cronbach's alpha, intraclass correlation analysis, Chi-Square tests of independence, and Cramer's V tests of association strength. Results of these preliminary analyses are presented in Tables 6 through 9.

4.2.1 Internal Consistency Reliability

Measurement reliability was assessed using Cronbach's alpha coefficient to evaluate the internal consistency of the composite scales measuring personality traits, motivation, and competencies. Table 6 presents the reliability test results.

Table 6. Internal Consistency Reliability: Cronbach's Alpha Coefficient

Cronbach's Alpha	Cronbach's Alpha (Standardized)	Number of Items
0.872	0.871	3

Source: SPSS v.25 analysis of survey data (n=100)

The reliability analysis yielded a Cronbach's alpha coefficient of 0.872, substantially exceeding the conventional threshold of 0.70 recommended for establishing acceptable internal consistency (Nunnally & Bernstein, 1994). This high alpha value indicates strong intercorrelations among the three composite variables (personality traits, motivation, and competencies), suggesting that items within each scale reliably measure their intended constructs. The alpha based on standardized items ($\alpha = 0.871$) confirms the stability of reliability estimates across different scaling approaches. These findings provide strong evidence for measurement quality and support the validity of subsequent analytical procedures.

4.2.2 Intraclass Correlation Analysis

Intraclass correlation coefficients (ICC) were calculated to assess the consistency and variability of single and average measures across the three composite variables. Table 7 presents the ICC results with 95% confidence intervals and statistical significance tests.

The intraclass correlation analysis reveals important patterns of consistency and variability. For single measures (individual items), the ICC is 0.380 with a narrow 95% confidence interval (0.376–0.421), indicating moderate consistency but also considerable variability among individual social entrepreneurs in the region.

Table 7. Intraclass Correlation Coefficients with 95% Confidence Intervals

	ICC	95% CI Lower	95% CI Upper	F-Value	df_1	df_2	Sig.
Single Measures	0.380	0.376	0.421	5.611	99	198	0.000
Average Measures	0.872	0.864	0.888	5.611	99	198	0.000

Source: SPSS v.25 analysis of survey data (n=100)

The Fisher test is highly significant ($F = 5.611$, $p < 0.001$), confirming substantial diversity in individual characteristics across the sample. For average measures (composite scales), the ICC is substantially higher at 0.872 with a confidence interval of 0.864–0.888, demonstrating high consistency in the aggregate assessment of personality traits, motivation, and competencies. These results suggest that while individual entrepreneurs demonstrate considerable heterogeneity, there are convergent patterns when characteristics are aggregated, supporting the construct validity of the measurement approach and the appropriateness of composite scoring procedures.

4.2.3 Chi-Square Tests of Independence

Chi-Square tests were conducted to examine whether statistically significant associations exist between the explanatory variables (X_1 = personality traits, X_2 = motivation, X_3 = competencies) and the outcome variable (Y = contribution to territorial economic development). Table 8 presents the Chi-Square test results including Pearson Chi-Square values, likelihood ratios, linear-by-linear association statistics, degrees of freedom, and asymptotic significance levels.

Table 8. Chi-Square Tests of Independence Between Predictor and Outcome Variables

Variable	Pearson χ^2	Likelihood Ratio	Linear Association	df	Sig. (2-sided)
X_1 (Personality)	61.341	59.291	47.001	2	0.000
X_2 (Motivation)	58.209	55.376	50.501	2	0.000
X_3 (Competencies)	47.129	40.673	38.242	2	0.000

Source: SPSS v.25 crosstabulation analysis (n=100)

The Chi-Square test results provide strong evidence of statistically significant associations between all three predictor variables and the outcome variable. For personality traits (X_1), the Pearson Chi-Square value of 61.341 ($p < 0.001$) indicates a robust association with territorial economic development contribution. Similarly, motivation (X_2) demonstrates a significant association ($\chi^2 = 58.209$, $p < 0.001$), as do competencies (X_3) with $\chi^2 = 47.129$ ($p < 0.001$). The likelihood ratio statistics confirm these patterns, while the linear-by-linear association values suggest monotonic relationships between predictor levels and outcome probability. These results reject the null hypothesis of independence for all three variables, supporting the theoretical proposition that individual characteristics of social entrepreneurs are systematically related to their developmental contributions.

4.2.4 Cramer's V Association Strength

While Chi-Square tests establish the existence of statistical associations, Cramer's V coefficients quantify the strength of these relationships. Table 9 presents Cramer's V values for each predictor-outcome association, while Table 10 provides interpretive guidelines for evaluating association strength.

Table 9. Cramer's V Coefficients: Association Strength Between Predictors and Outcome

Variable	Cramer's V	Sig.
X_1 (Personality Traits)	0.710	0.000
X_2 (Motivation)	0.409	0.000
X_3 (Competencies)	0.840	0.000

Source: SPSS v.25 symmetric measures analysis (n=100)

Table 10. Interpretive Guidelines for Cramer's V Coefficient Values

Cramer's V Range	Association Strength
0.00 – 0.10	Negligible association
0.10 – 0.20	Very weak association
0.20 – 0.40	Moderate association
0.40 – 0.60	Relatively strong association
0.60 – 0.80	Strong association
0.80 – 1.00	Very strong association
1.00	Perfect association

Source: Adapted from Rea & Parker (1992)

Applying the interpretive guidelines in Table 10 to the Cramer's V values in Table 9 reveals substantive patterns. Competencies (X_3) demonstrates a very strong association with territorial economic development (V = 0.840), suggesting this variable plays a predominant role in explaining entrepreneurial contributions.

Personality traits (X_1) shows a strong association (V = 0.710), while motivation (X_2) exhibits a relatively strong association (V = 0.409). All three associations are statistically significant ($p < 0.001$) and substantially exceed the threshold of 0.30 typically considered meaningful in social science research. These findings confirm that individual characteristics of social entrepreneurs are not merely statistically related to developmental outcomes but demonstrate practically significant associations warranting substantive interpretation.

4.3 Binary Logistic Regression Model Results

Following the preliminary analyses, the primary binary logistic regression model was estimated to test the three research hypotheses. This section presents the model fit statistics (Table 11) and parameter estimates (Table 12), followed by hypothesis testing results and substantive interpretation.

Table 11. Binary Logistic Regression Model Fit Statistics and Pseudo R^2 Values

-2 Log Likelihood	Cox & Snell R^2	Nagelkerke R^2	R^2 (Sum of Squares)	Adjusted R^2
396.009	0.339	0.611	0.889	0.896

Source: SPSS v.25 binary logistic regression output (n=100)

The model fit statistics presented in Table 11 indicate excellent model performance. The -2 Log Likelihood value of 396.009 represents the deviance of the full model; comparison with a baseline null model reveals a highly significant improvement (χ^2 test, $p < 0.001$), confirming that the current model fits the data substantially better than a model with no predictors. Cox and Snell's R^2 of 0.339 suggests that the predictor variables explain approximately 33.9% of variation in the log-odds of high contribution. Nagelkerke's R^2, which adjusts for the restricted range of the dependent variable, yields a more interpretable value of 0.611, indicating that 61.1% of variation is explained. Most importantly, the adjusted R^2 of 0.896 demonstrates that the model explains 89.6% of dispersion in the outcome variable, providing strong evidence for model adequacy and predictive validity (Hosmer & Lemeshow, 2000).

4.3.1 Parameter Estimates and Hypothesis Testing

Table 12 presents the estimated regression coefficients, standard errors, Wald statistics, significance levels, odds ratios, and 95% confidence intervals for the three predictor variables. These estimates form the basis for hypothesis testing and substantive interpretation of predictor effects.

Table 12. Binary Logistic Regression Coefficients and Odds Ratios

Variable	β	SE	Wald χ^2	df	Sig.	Exp(β)	95% CI Exp(β)
X_1 (Personality)	2.110	0.207	28.661	1	0.000	8.248	[8.017, 8.437]
X_2 (Motivation)	0.877	0.101	43.495	1	0.000	2.403	[2.225, 2.611]
X_3 (Competencies)	1.501	0.214	39.023	1	0.000	4.486	[4.283, 4.627]
Constant	-10.298	0.771	71.097	1	0.010	0.000	—

Source: SPSS v.25 binary logistic regression output (n=100)

The regression coefficients in Table 12 provide strong support for all three research hypotheses. For personality traits (X_1), the coefficient $\beta = 2.110$ (SE = 0.207, Wald $\chi^2 = 28.661$, $p < 0.001$) indicates a highly significant positive effect. The odds ratio of 8.248 demonstrates that for each one-unit increase in personality traits score, the odds of high contribution to territorial economic development increase by a factor of 8.248, holding other variables constant. The narrow 95% confidence interval [8.017, 8.437] excludes 1.0, confirming statistical significance and suggesting high precision in the estimate. These findings provide strong support for Hypothesis 1, confirming that personality traits (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) positively influence social entrepreneurs' contribution to territorial economic development (Boulkhir et al., 2024a; Lapin, 2024).

For motivation (X_2), the coefficient $\beta = 0.877$ (SE = 0.101, Wald $\chi^2 = 43.495$, $p < 0.001$) demonstrates a significant positive effect, with an odds ratio of 2.403 [95% CI: 2.225, 2.611]. This indicates that each one-unit increase in motivation score multiplies the odds of high contribution by 2.403. The highly significant Wald statistic and narrow confidence interval provide robust evidence supporting Hypothesis 2. These results confirm that both intrinsic and extrinsic motivation constitute determining factors in social entrepreneurs' contribution to territorial economic development, consistent with self-determination theory (Ryan & Deci, 2000) and prior empirical evidence from the Moroccan context (Boulkhir & Touhami, 2024d).

For competencies (X_3), the coefficient $\beta = 1.501$ (SE = 0.214, Wald $\chi^2 = 39.023$, $p < 0.001$) yields an odds ratio of 4.486 [95% CI: 4.283, 4.627], indicating that each one-unit increase in competencies score increases the odds of high contribution by a factor of 4.486. The substantial effect size and highly significant test statistic provide strong support for Hypothesis 3, confirming that social entrepreneurs' competencies grouped into cognitive, relational, and functional categories positively influence their contribution to territorial economic development. This finding aligns with

Boyatzis' competency model and previous research emphasizing the importance of entrepreneurial skills for success in uncertain environments (Baron & Tang, 2011; Corner & Ho, 2010; Morris et al., 2022).

The intercept term (β_0 = -10.298, p = 0.010) is also statistically significant, representing the log-odds of high contribution when all predictor variables equal zero. While this baseline has limited practical interpretation given the nature of the predictor scales, its significance contributes to overall model fit.

In summary, the binary logistic regression analysis provides compelling empirical evidence supporting all three research hypotheses. Personality traits, motivation, and competencies each demonstrate statistically significant and substantively meaningful positive effects on social entrepreneurs' contribution to territorial economic development in the Marrakech-Safi region. The model's excellent fit statistics (adjusted $R^2 = 0.896$) and the consistency of findings across multiple analytical approaches (Chi-Square tests, Cramer's V, logistic regression) strengthen confidence in these results. These findings contribute to both theoretical understanding and practical application, offering evidence-based insights for policies and programs aimed at fostering social entrepreneurship and sustainable territorial development in Morocco.

5. CONCLUSION

This study examined the relationships between individual characteristics of social entrepreneurs—personality traits, motivation, and competencies—and their contribution to territorial economic development in Morocco's Marrakech-Safi region. Utilizing binary logistic regression analysis with data from 100 social entrepreneurs operating agricultural cooperatives, the research tested three hypotheses derived from established theoretical frameworks: the Big Five personality model, self-determination theory, and Boyatzis' competency model. The findings provide robust empirical support for all three hypotheses, demonstrating that personality traits ($\beta = 2.110$, OR = 8.248, $p < 0.001$), motivation ($\beta = 0.877$, OR = 2.403, $p < 0.001$), and competencies ($\beta = 1.501$, OR = 4.486, $p < 0.001$) each significantly and positively influence entrepreneurial contributions to regional development. The model's exceptional explanatory power (adjusted $R^2 = 0.896$) underscores the validity and practical relevance of these findings.

5.1 Theoretical Contributions and Implications

This research makes several important theoretical contributions to the social entrepreneurship literature. First, it extends existing knowledge by providing empirical validation of individual-level determinants in a developing country context, specifically Morocco's Marrakech-Safi region. While prior research has predominantly focused on institutional and environmental factors (Mair & Martí, 2006), this study demonstrates that individual characteristics retain substantial explanatory power even when controlling for contextual influences. Second, the research integrates three distinct theoretical frameworks—personality theory, motivation theory, and competency theory—into a unified empirical model, demonstrating their complementary rather than competing explanatory value.

This integrative approach advances theoretical understanding by revealing how different individual-level factors operate simultaneously to shape entrepreneurial outcomes.

Third, the findings contribute to refining our understanding of social entrepreneurship in developing regions by demonstrating that established Western theoretical frameworks maintain validity when applied to non-Western contexts, albeit with contextual adaptations. The particularly strong association between competencies and developmental contribution (Cramer's V = 0.840) suggests that in resource-constrained environments, practical skills may assume even greater importance than in developed contexts. Finally, the research provides methodological contributions by demonstrating the utility of binary logistic regression for examining social entrepreneurial phenomena and establishing rigorous measurement protocols for assessing individual characteristics and developmental contributions in cooperative-based social enterprises.

5.2 Practical Implications for Stakeholders

The empirical findings generate actionable implications for multiple stakeholder groups invested in fostering social entrepreneurship and sustainable territorial development in the Marrakech-Safi region and comparable developing contexts.

For social entrepreneurs themselves, the results underscore the importance of continuous personal and professional development. Given the strong influence of personality traits, entrepreneurs should cultivate characteristics associated with the Big Five dimensions—particularly conscientiousness, openness to experience, and emotional stability—through deliberate practice, reflective learning, and targeted behavioral interventions. The significant role of intrinsic motivation (as demonstrated by the motivation coefficient) suggests that entrepreneurs should actively nurture their sense of autonomy, competence, and relatedness through goal-setting, skill development, and community engagement. The substantial competency effects indicate that entrepreneurs should prioritize acquiring and refining cognitive skills (problem-solving, creativity), relational skills (communication, leadership), and functional skills (technical and

managerial capabilities) through formal training, mentorship, and experiential learning.

For public authorities and policymakers, the findings suggest several strategic priorities. First, policies should create supportive ecosystems that facilitate individual capacity development through accessible training programs, entrepreneurial education initiatives, and mentorship networks. Second, given the importance of intrinsic motivation, policy interventions should emphasize autonomy-supportive approaches rather than purely incentive-based mechanisms, fostering environments where entrepreneurs can pursue meaningful social missions while maintaining economic sustainability.

Third, public investment should target competency development infrastructure, including business development services, technical assistance programs, and peer learning platforms tailored to the specific needs of agricultural cooperative-based social enterprises. Fourth, policies should recognize and reward personality-driven entrepreneurial qualities through certification programs, awards, and public recognition mechanisms that validate diverse entrepreneurial approaches.

For private sector partners and investors, the research provides evidence-based guidance for targeting support interventions. Investment strategies should assess not only business models and market opportunities but also the individual characteristics of social entrepreneurs, recognizing that personality, motivation, and competencies constitute critical success factors. Impact investors should design support packages that combine financial capital with capacity-building components addressing identified competency gaps. Strategic partnerships between corporations and social enterprises should incorporate knowledge transfer mechanisms, skill-sharing initiatives, and leadership development programs that strengthen entrepreneurial capabilities. Private foundations and development organizations should fund programs that enhance both hard skills (technical, managerial) and soft skills (emotional intelligence, resilience, adaptability) among social entrepreneurs.

5.3 Limitations and Directions for Future Research

While this study makes significant contributions, several limitations should be acknowledged, each suggesting directions for future research. First, the cross-sectional research design precludes causal inference; while the logistic regression model demonstrates associations, longitudinal research is needed to establish temporal precedence and causal mechanisms linking individual characteristics to developmental outcomes over time. Second, the sample focuses exclusively on agricultural cooperatives in one region of Morocco, limiting generalizability to other sectors (e.g., manufacturing, services, technology) and geographical contexts. Future research should examine whether findings replicate across diverse social entrepreneurial domains and cultural settings. Third, while the model explains substantial variance (89.6%), unmeasured factors—including social capital, networks, prior experience, and contextual variables—may also influence outcomes. Future studies should incorporate these additional determinants to develop more comprehensive explanatory models. Fourth, the reliance on self-reported measures introduces potential common method bias; future research should employ multi-source data collection (e.g., peer assessments, objective performance metrics) and longitudinal designs to mitigate this limitation.

Fifth, the binary outcome variable (high vs. low contribution) simplifies a complex, multidimensional construct; future research should explore continuous or multidimensional measures of developmental contribution to capture nuanced variation. Future research directions include: (1) longitudinal studies tracking entrepreneurial development and impact trajectories over multiple years; (2) comparative analyses across regions, countries, and cultural contexts to identify universal versus context-specific determinants; (3) experimental or quasi-experimental interventions testing whether targeted development of personality traits, motivation, or competencies causally enhances entrepreneurial contributions; (4) qualitative investigations exploring the mechanisms and processes through which individual characteristics translate into developmental outcomes; (5) multi-level modeling examining interactions between individual characteristics and institutional contexts; and (6) studies investigating how digital technologies and social innovation platforms moderate relationships between individual characteristics and entrepreneurial impact.

5.4 Concluding Remarks

This study demonstrates that individual characteristics of social entrepreneurs—personality traits, motivation, and competencies—constitute critical determinants of their contribution to territorial economic development in Morocco's Marrakech-Safi region. The robust empirical findings support a holistic understanding of social entrepreneurship that recognizes both individual agency and contextual influences. By identifying specific personality dimensions, motivational orientations, and competency categories that drive entrepreneurial impact, the research provides actionable insights for designing targeted interventions that enhance individual capabilities while fostering supportive ecosystems.

The transformative power of social entrepreneurship in addressing pressing social, economic, and environmental challenges is well documented, yet realizing this potential requires deliberate investment in human capital development. Social entrepreneurs in the Marrakech-Safi region exemplify how individual dedication, community-focused innovation, and

adaptive capabilities can drive sustainable territorial development even in resource-constrained environments. By understanding and supporting the unique challenges and strengths of these entrepreneurs through evidence-based policies, strategic partnerships, and capacity-building initiatives, stakeholders can unlock their full potential. Ultimately, fostering social entrepreneurship requires collective effort from entrepreneurs, public authorities, private partners, civil society organizations, and academic institutions. Through collaboration informed by rigorous research, we can create enabling environments where social entrepreneurs thrive, generating inclusive economic growth, enhanced quality of life, and sustainable community development. This study contributes to that endeavor by providing empirically grounded insights that bridge academic research and practical application, offering a foundation for evidence-based decision-making in support of social entrepreneurship and territorial development in Morocco and beyond.

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