



Does human capital competency affect the performance of Ethiopian Coffee cooperatives?

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Abstract

A nation's ability to generate income and expand is largely dependent on its human capital. Ethiopia, the fourth-largest coffee exporter and the fastest-growing coffee market, relies heavily on its human capital and coffee cooperatives. Numerous empirical studies have investigated the performance of coffee cooperatives in relation to the effective utilization of human capital. The existing literature has emphasized the impact of optimizing coffee cooperatives' performance through human capital, particularly using Structural Equation Modeling (SEM). This paper employs generalized Exploratory Factor Analysis (EFA), Confirmatory Factor Analysis (CFA), and SEM approaches to explore this relationship. The empirical findings demonstrate a significant connection between the performance of Ethiopian coffee cooperatives and human capital competency. Additionally, the study challenges the prevailing notion that the development of human capital within coffee cooperatives has stagnated. According to the SEM analysis, the performance of a coffee cooperative can increase by 70.3% with a one standard deviation improvement in human capital, assuming other independent variables remain constant. Consequently, the study recommends that policymakers prioritize the development of human capital to enhance the performance of coffee cooperatives.

Keywords: Coffee Cooperatives, Economy, Financial Services, Human Capital

1. INTRODUCTION

Ethiopia is a major global coffee producer, making the prosperity of its cooperatives crucial to the international coffee market (Omer et al., 2016). For these cooperatives to become more innovative, efficient, and competitive, effective management of human capital is essential. This management directly impacts both the quantity and quality of coffee produced and traded internationally (Nusa, 2021).

The concept of human capital, initially introduced by economists like Adam Smith and further developed by scholars such as Gary Becker, refers to the knowledge, skills, and expertise individuals possess within an organization or industry. These factors significantly influence economic development and productivity (Mohammed & Lee, 2015).

While human capital theoretically enhances the performance of coffee cooperatives, empirical studies present inconsistent findings. Some research indicates a significant positive correlation between human capital proficiency and cooperative performance (Czyżewski et al., 2021; Tilahun, 2007). However, other studies (Ployhart, 2021; Omer et al., 2020; AlQershi et al., 2021) suggest less important or even negative effects. It is vital to identify and address these discrepancies for a comprehensive understanding of the relationship.

The resource-based approach, social capital theory, and human capital theory provide theoretical frameworks that illuminate how human capital proficiency can impact coffee cooperative performance (Shumeta & D'Haese, 2016). These frameworks emphasize the importance of investing in human capital, building networks, and leveraging knowledge and skills to achieve strategic goals and sustainable competitive advantage (Ployhart, 2021). Practical challenges in examining the relationship between human capital and cooperative performance in Ethiopia include data availability, difficulties in measuring human capital proficiency, lack of research resources, and the complexity of factors influencing cooperative performance in a diverse and changing market environment (Omer et al., 2016).

To address these challenges and resolve conflicting evidence, this study conducts a comprehensive empirical investigation into the relationship between human capital proficiency and the performance of Ethiopian coffee cooperatives. By employing meticulous research techniques, superior data collection, contextual analysis, and stakeholder engagement in the coffee industry, this study aims to provide an in-depth understanding of how human capital affects cooperative performance. Furthermore, it seeks to offer valuable insights for policymakers, cooperative members, and other stakeholders to enhance the sustainability and effectiveness of coffee cooperatives in Ethiopia and beyond by integrating theoretical frameworks with practical implications.

The efficiency of Ethiopian coffee cooperatives and the relationship between human capital and their performance require further research. Despite previous studies on this topic, there are numerous methodological errors, theoretical gaps, knowledge deficits, and contextual inconsistencies that need to be addressed. While some studies demonstrate a positive correlation between skilled and educated personnel and higher performance (Czyżewski et al., 2021; Kant et al., 2022), others indicate a lack of significant association or even negative effects (Omer et al., 2020; AlQershi et al., 2021). Given these conflicting results, additional investigation is necessary to fully comprehend the underlying dynamics.

Ethiopian coffee cooperative performance is poorly monitored concerning the impact of human capital due to a lack of reliable and consistent approaches (Emana, 2019). The variety of measurement methods, sample sizes, and data collection processes used in previous studies makes it challenging to compare and generalize findings (Omer et al., 2020). Therefore, developing a rigorous framework for studying this relationship constitutes a methodological gap. Additionally, the theoretical foundations explaining the relationship between human capital and Ethiopian coffee cooperative performance remain underdeveloped (AlQershi et al., 2021).

Previous research has often relied on general conceptions of human capital, such as education and training, neglecting the unique characteristics and dynamics of Ethiopia's cooperative coffee sector (Czyżewski et al., 2021). In the absence of specific theoretical frameworks, our understanding of how human capital fosters cooperative performance is limited. It remains unclear which specific human capital attributes are most relevant to Ethiopian coffee cooperatives (Kant et al., 2022). While some studies focus on the formal education levels of cooperative members (Emana, 2019), additional factors—such as leadership qualities, prior experience in the coffee industry, and vocational skills—should also be explored (AlQershi et al., 2021). Understanding these factors will facilitate the development of targeted interventions and policies.

According to Omer et al. (2020), Ethiopia's cooperative coffee industry operates within a unique institutional and socioeconomic context. The relationship between human capital and cooperative performance may be influenced by various factors, including market dynamics, government regulations, resource accessibility, and cultural norms (Czyżewski et al., 2021). However, these contextual factors have not been extensively investigated in previous research. Addressing these context gaps can enhance our understanding of the unique opportunities and challenges facing Ethiopian coffee cooperatives.

Ultimately, further study is required to fully understand how human capital influences the performance of Ethiopian coffee cooperatives given the existing gaps in evidence, methodology, theory, knowledge, and context. By addressing these gaps, we can improve our comprehension of the relationship between cooperative performance and human capital, aiding academics, practitioners, and policymakers in developing strategies and programs that will enhance the performance and sustainability of Ethiopia's coffee cooperatives.

2. THEORETICAL FOUNDATION

Social Capital Theory: This theory posits that social networks, linkages, and trust are essential for fostering cooperation and achieving collective goals (Ployhart, 2021). In the context of coffee cooperatives, strong social ties, mutual trust, and efficient communication among cooperative members can enhance information sharing, resource mobilization, and group decision-making, ultimately improving cooperative performance (Yadete et al., 2023).

Human Capital Theory: Proposed by economists Theodore Schultz and Gary Becker, this theory suggests that investing in education, training, and skill development increases individuals' earning potential and productivity (Nazari et al., 2017). In the context of Ethiopian coffee cooperatives, investments in member education and training programs can enhance productivity, skills, and knowledge, thereby improving cooperative performance (Nusa, 2021).

Resource-Based View (RBV) Theory: This concept emphasizes the unique assets and capabilities of an organization as sources of competitive advantage (Nusa, 2021). In coffee cooperatives, human capital—defined by the skills, knowledge, and life experiences of cooperative members—can differentiate cooperatives from competitors. Effective utilization of human resources can lead to improved performance and sustainability.

Agency Theory: Agency theory examines the relationship between agents, such as cooperative managers, and principals, like cooperative members, highlighting how information asymmetry can lead to conflicts of interest (Kant et al., 2023). Human capital influences the alignment of

members' interests with managers' decision-making processes. Strong human capital, which includes managerial and leadership skills, enables cooperative managers to effectively represent members' interests, leading to improved decision-making and higher cooperative performance (Nusa, 2021).

Institutional Theory: This theory focuses on how broader social, cultural, and regulatory norms impact organizational behavior and performance (Ployhart, 2021). In the case of Ethiopia's coffee cooperatives, the institutional environment—comprising laws, regulations, and cultural norms—shapes cooperative performance (Adula et al., 2023). This theory underscores the importance of aligning human capital development programs with the institutional environment to enhance cooperative performance.

Stakeholder Theory: This theory emphasizes the need to consider the interests of various stakeholders—such as consumers, employees, cooperative members, and the community—when making decisions within an organization (Nusa, 2021). Investments in human capital for coffee cooperatives should encompass the broader social and economic implications for stakeholders (Kant et al., 2023). By addressing the needs and interests of various stakeholders, coffee cooperatives can achieve sustainable performance and contribute to community development (Ployhart, 2021).

Human capital competence significantly impacts the efficacy of coffee cooperatives (Boson et al., 2023). Members of cooperatives with highly competent human capital likely possess specialized knowledge and skills relevant to the industry (Ployhart, 2021). This competence can enhance efficiency in various operations, including planting, harvesting, processing, marketing, and quality control. Cooperatives with strong human resources tend to foster a more innovative workforce (Gupta & Raman, 2021). Members with training and experience can contribute creative ideas and solutions that lead to the development of new products, processes, and strategies, thereby enhancing the cooperative's success (Tuncdogan et al., 2021).

Competent human capital within the cooperative enables improved decision-making. Members with high levels of knowledge can assess information and make decisions that promote the cooperative's growth and long-term viability. Adaptability is essential for success in the competitive, fast-paced coffee industry. A cooperative with skilled human capital can stay ahead of the curve by swiftly adapting to changing consumer preferences, market conditions, regulatory requirements, and technological advancements. With highly skilled and competent human resources, a coffee cooperative can operate more efficiently (Shiferaw et al., 2023), leading to increased output, cost-effectiveness, and overall performance, thus enhancing competitiveness and success (Gobena & Kant, 2022).

Human capital competence also affects customer interactions and satisfaction (Tuncdogan et al., 2021). Cooperative members possessing the necessary skills and knowledge can adeptly handle challenges, build strong customer relationships, and provide exceptional service. These actions foster consumer loyalty and goodwill. Effective human capital management is crucial for enhancing customer relations, productivity, creativity, adaptability, and efficiency, all of which directly influence the cooperative's performance and commercial success (Panigrahi et al., 2023). **Hypothesis 1 (H1):** The performance of coffee cooperatives is impacted by human capital competencies. Education, training, and awareness are utilised as stand-ins for human capital. The BSC model, which is used to measure business performances, provides the basis for

the usage of proxies for coffee cooperative performance, including non-financial performance, financial performance, and employee happiness.

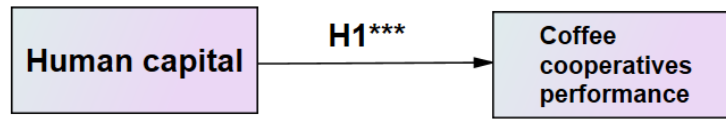


Figure 1: Conceptual Framework
Source: Researchers Own construct, 2023

3. MATERIALS AND METHODS

3.1. Description of the Study Area

Oromia, one of Ethiopia's largest regions, produced 3,101,927.33 quintals of coffee on 489,799.36 hectares of land during the current fiscal year, with an average yield of 6.33 quintals per hectare. The Oromia Coffee Farmers Cooperative Union (OCFCU) was established in 1999 and has since seen substantial growth. It now represents 250 cooperatives with a total membership of 250,000 coffee farmers. Among the coffee-growing areas, the Guji administrative zone stands out for its facilities, which are well-suited for the cultivation and export of coffee.

3.2. Study Population, Sample Size, and Data Sources

The study collected primary data from 425 members of coffee-producing cooperatives through a standardized questionnaire. The target population comprised 33 coffee farmers' unions that have operated for more than five years in six coffee-producing districts within Ethiopia's West and East Guji zones. Though the study does not specify guidelines for sample size, previous studies suggests a 10:1 event-to-independent variable ratio for multiple regression analysis. This is deemed adequate for reflecting a homogenous population, while larger samples are necessary for more heterogeneous groups.

Secondary data consisted of 10 years' worth of balanced panel time series data, sourced from audited financial records.

3.3. Sampling Techniques and Procedures

A systematic random sampling method was employed to select cooperatives from multiple clusters. Cluster sampling is especially useful when dealing with large and geographically diverse populations, as it enhances sampling efficiency and reduces costs. In cases where the number of clusters varies significantly, a probability proportional to size technique was applied to ensure fairness in the selection of clusters, addressing any potential imbalance.

3.4. Data Analysis Tool

Data were analyzed using SPSS AMOS version 26, incorporating univariate, bivariate, and multivariate statistical techniques. These softwares are instrumental in performing the necessary statistical analyses to evaluate the relationship between human capital and cooperative performance.

4. RESULTS AND DISCUSSION

4.1. Assessment of normality

The assessment of normality involves evaluating the skewness and kurtosis of the data, which are indicators of the symmetry and tail-heaviness (or lightness) of the distribution compared to a normal distribution. Skewness measures the asymmetry of the data around the central point, where a perfectly symmetrical data set has a skewness of zero. Positive skewness indicates a distribution with a long tail on the right, while negative skewness indicates a long tail on the left. Kurtosis, on the other hand, reflects the presence of heavy or light tails compared to a normal distribution. High kurtosis suggests heavy tails, which means a higher likelihood of extreme values, while low kurtosis suggests light tails with fewer extreme values. In this study, education, training, and awareness are used as proxies for human capital. To assess the performance of coffee cooperatives, the Balanced Scorecard (BSC) model is employed. This model provides a comprehensive framework by integrating various performance metrics, including: (1) Non-financial performance: This includes aspects such as customer satisfaction, internal processes, and innovation. (2) Financial performance: Evaluates the cooperatives' profitability, revenue growth, and cost management. (3) Employee satisfaction: Focuses on the overall well-being, motivation, and productivity of cooperative members. The analysis explores how human capital, represented by these proxies, impacts both the financial and non-financial performance of the coffee cooperatives. The results of the normality test showed acceptable levels of skewness and kurtosis, indicating that the data is sufficiently normal for further statistical analysis.

Table 1: Normality test

Variable	Min	Max	Skew	c.r.	kurtosis	c.r.
NONFIN_Mean	2.333	5.000	.054	.434	-.339	-1.356
FIN_Mean	2.333	5.000	-.044	-.352	-.683	-3.136
EMSAT_Mean	2.000	5.000	.051	.407	-.491	-1.968
EDU_Mean	1.000	5.000	-.163	-6.109	.101	.403
TRAN_Mean	1.000	5.000	-.159	-7.681	.674	3.900
AW_Mean	1.000	5.000	-.110	-5.687	.671	3.888
Multivariate					3.672	4.679

Note: NONFIN=non financial performance; FIN= financial performance; EMSAT= employee satisfaction; EDU= education; TRAN=training and AW=awareness

To also display an even univariate distribution, the asymmetry and kurtosis criteria have been set between -2 and +2. Because the skewness and kurtosis measurements fell between 2 and +2, and between 7 and +7, respectively, the data is considered normal.

4.2. Data Reliability

To assess the reliability of the data and determine whether factor analysis was appropriate, the research team conducted a Kaiser-Meyer-Olkin (KMO) test for sampling adequacy. The KMO test evaluates whether the data set is suitable for factor analysis by examining the proportion of variance among variables that might be common variance. A higher KMO value (closer to 1) indicates that the data is well-suited for factor analysis. In addition to the KMO test, Bartlett's Test of Sphericity was used to test the null hypothesis that the variables in the population correlation matrix are uncorrelated. By rejecting this null hypothesis, Bartlett's test

confirms that there is sufficient correlation among the variables to justify factor analysis. The combination of both tests ensured the robustness and reliability of the data for further analysis.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.792
Bartlett's Test of Sphericity	Approx. Chi-Square	690.440
	Df	15
	Sig.	.000

The Kaiser-Meyer-Olkin (KMO) value was determined to be 0.792, which falls within the acceptable range of 0.6 to 1. This value indicates that the data set is sufficiently compact and that factor analysis is appropriate for identifying reliable and distinct determinants. A KMO value greater than 0.5 suggests that the sample is adequate for conducting factor analysis. The analysis focused on two components of the latent variable related to performance appraisal: technique and the human capital plan. The KMO test indicated that the data exhibited sphericity, a prerequisite for factor analysis, as confirmed by Bartlett's Test of Sphericity. Bartlett's test coefficient of 0.792 supported the KMO findings, demonstrating that the data were suitable for factor analysis. The explained total variation for these components is presented in the table below.

Table 3: Cumulative Explained Variance

module sum	Initial Eigenvalues			Squared Loadings Extraction Total			Squared Loadings Rotation Total			
	% of discrepancy	collective %	Sum	% of inconsistency	collective %	Sum	% of discrepancy	Total %		
Aspect	1	2.990	49.829	49.829	2.990	49.829	49.829	2.243	37.381	37.381
	2	1.044	17.407	67.236	1.044	17.407	67.236	1.791	29.855	67.236
	3	.623	10.379	77.615						

Extraction Method: Principal Component Analysis.

The Total Variance Explained was determined to be 67.236% using Varimax rotation and Principal Component Analysis (PCA). Seven factors were identified with initial Eigenvalues greater than 1, indicating their significance and relevance as proxies for future research. The total variance of 67.236% suggests that these seven components collectively account for 67.236% of the variance in the dependent variable's behavior. Confirmatory Factor Analysis (CFA) was conducted to test and validate the identified components based on their underlying structure and observed correlations between variables. This analysis allows researchers to confirm hypotheses related to the factor structure and ensure the robustness of the identified components (Luong & Flake, 2022).

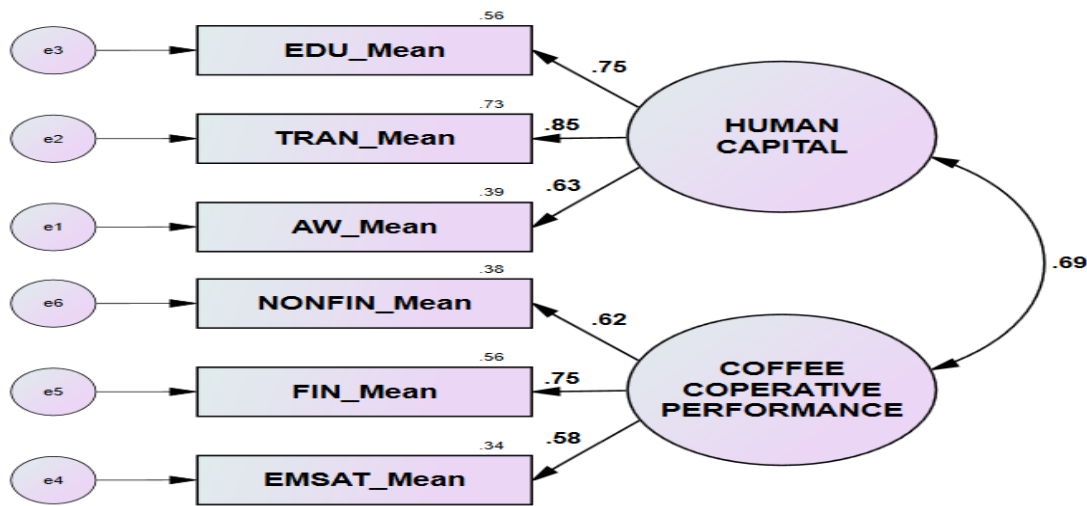


Figure 2: Confirmatory Factor Analysis

Note: NONFIN=non financial performance; FIN= financial performance; EMSAT= employee satisfaction; EDU= education; TRAN=training and AW=awareness

The CFA results in Table 4 indicate a correlation between human capital (H1) and coffee cooperatives. The estimated covariance of 0.122 suggests a relationship close to a normally distributed random variable, with a standard error of 0.018. Any critical ratio exceeding 1.96 (such as 6.647) is considered significant, assuming the “distribution” assumptions for the AMOS model hold. The standard error of the covariance is 0.017, and since the critical ratio exceeds 1.96 at the 0.05 significance level, the covariance between the variables is statistically significant.

Table 4: Covariances

		Estimate	S.E.	C.R.	P	Hypothesis
Human Capital	<--> Coffee Cooperative Performance	.108	.016	6.647	***	H1

4.3. Discriminant Validity

The lack of significant correlations between indicators of concepts that theoretically should not be correlated provides evidence of discriminant validity. In practice, discriminant validity coefficients should be smaller in magnitude than convergent validity coefficients, as demonstrated by the data in the Table 5.

Table5: Validity for Discriminant issue

	Critical Ratio	Avg. Vari.Ex.	MSV	Max-R(H)	Human Capital	Coffee Cooperative Performance
Human Capital	0.737	0.589	0.582	0.779	0.769	
Coffee Cooperative Performance	0.729	0.681	0.569	0.741	0.711	0.759

Discriminant validity was confirmed as the square root of the AVE for Coffee Cooperatives Performance was higher than the absolute value of its correlations with other components. Additionally, the AVE for Coffee Cooperatives Performance exceeded the MSV, further demonstrating discriminant validity. No issues with convergent validity were found in the dataset.

4.4. Structural Equation Model

Structural equation modeling (SEM) is a multivariate statistical technique used to examine structural relationships between measured variables and latent constructs. This method combines multiple regression analysis with factor analysis to explore the relationships between observed and unobserved variables.

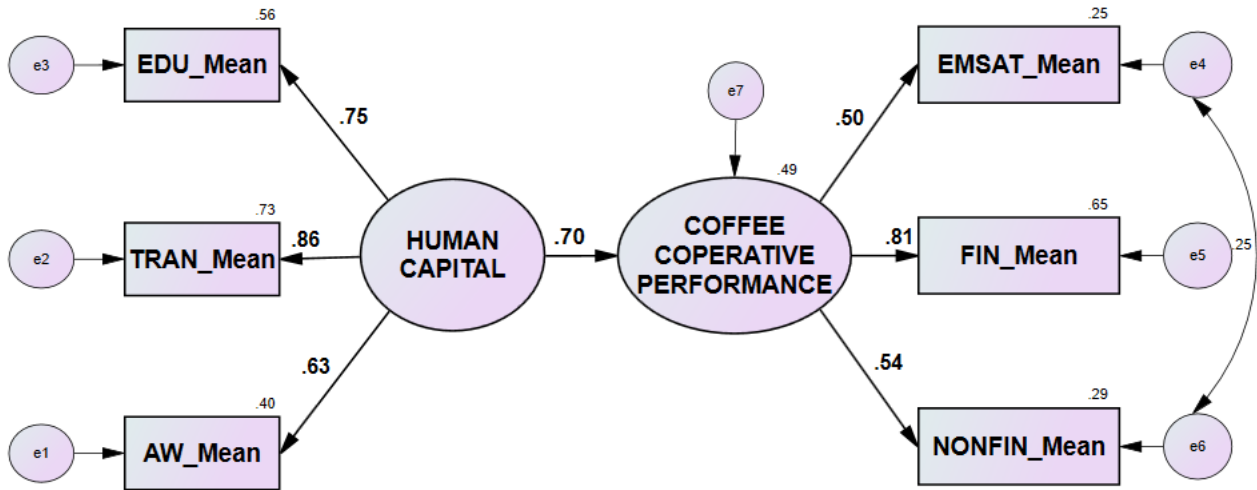


Figure 3: Structural equation model

Note: NONFIN= non-financial performance; FIN= financial performance; EMSAT= employee satisfaction; EDU= education; TRAN=training and AW=awareness

The factor loading represents the relationship between human capital and its observed items (proxies) and a factor. It indicates the amount of variance in the observed item that can be explained by the factor. Generally, a factor loading of 0.5 or higher suggests that the factor has adequately accounted for the variation in the variable. In the structural equation model (SEM), the performance of coffee cooperatives increases by 70% when human capital improves by one standard deviation, assuming other variables remain constant. Standardized regression weights were calculated for the data, showing that the 70% change in coffee cooperative performance corresponds to a one-unit change in human capital.

4.5. Model fit indices

A satisfactory model fit is shown by the CMIN/DF value of 2.774, which is below the value of 3, as per the findings displayed in the above table. The root mean square error of approximation is 0.068 less than 0.080, the comparative fit index (CFI) is 0.982 more than 0.90, the goodness fit index (GFI) is 0.983 greater than 0.95, and the p value is 0.007. This leads to a good overall fit of the model. The number that matters in this case is 0.983, which is higher than 0.95 and shows that the researchers' suggested model differs from other models. This is the GFI for the default model. The amount of variation in the dependent variable that can be attributed to a change in the predictor variable equal to one standard deviation unit is represented by the standardised regression weights.

Table 6: Goodness of Fit (GOF) indices

Measurement Category	Fit Indices	Model Value
Chi-Square	CMIN	19.417
	P-Value	.007
	CMIN/DF	2.774
Absolute fit measurement	GFI	.983
	SRMR	.0229
	RMSEA	.068
Incremental fit measurement	CFI	.982
	IFI	.982
	RFI	.940
	TLI	.961
parsimony fit measure	PNFI	.454
	PCFI	.458

According to standardized regression weight measurements, a one-unit change in human capital resulted in a 70.3% change in the coffee cooperative's performance, measured in standard deviations. The beta weight, or regression coefficient for standardized data, was 70.3%. This means that the performance of coffee cooperatives typically increases by 70.3% when human capital improves by one standard deviation, assuming all other independent factors remain constant.

Table 7: Standardized Regression Weights

			Estimate
Coffee Cooperative Performance	<---	Human Capital	.703
Awareness	<---	Human Capital	.631
Training	<---	Human Capital	.856
Education	<---	Human Capital	.746
Employee satisfaction	<---	Coffee Cooperative Performance	.499
Financial Performance	<---	Coffee Cooperative Performance	.809
Non-Financial Performance	<---	Coffee Cooperative Performance	.541

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

In conclusion, the success of Ethiopian coffee cooperatives is significantly influenced by human capital competencies. The skills, experience, and knowledge of cooperative members play a critical role in enhancing creativity, productivity, and competitiveness in the global coffee market. Theoretical frameworks highlight the importance of human capital in fostering cooperative performance; however, empirical findings can sometimes be inconsistent, posing practical challenges in fully understanding this relationship. The study's findings are consistent with previous research by [AlQershi et al. \(2021\)](#), [Omer et al. \(2020\)](#), [Kant et al. \(2022\)](#), and [Czyżewski et al. \(2021\)](#).

To address the challenges and uncertainties surrounding the relationship between human capital and Ethiopian coffee cooperative performance, further research and empirical analysis are needed. Robust research methodologies, comprehensive data collection, theoretical frameworks, and stakeholder engagement can help clarify how human capital directly impacts cooperative outcomes. The study's findings align with the core assumptions of the Resource-Based View (RBV) and human capital theories.

5.2. Recommendations

Ethiopian coffee cooperatives should prioritize investments in human capital development by focusing on member education, training, and skill-building. Enhancing members' skills and knowledge will lead to improvements in creativity, productivity, and overall performance. Encouraging members to actively contribute their ideas and expertise can foster collaboration, innovation, and the exchange of best practices, all of which will strengthen cooperative performance. Additionally, building effective communication channels within cooperatives will enable the flow of information and the development of new ideas that drive growth.

Strengthening leadership and management within coffee cooperatives is also essential for long-term success. By investing in leadership development and training, cooperatives can improve decision-making processes and enhance organizational performance. Successful management, supported by strong leaders, is crucial for ensuring cooperatives' sustainable growth. Furthermore, establishing reliable partnerships with stakeholders across the coffee value chain, such as other cooperatives, government agencies, NGOs, and corporations, can facilitate market access, information sharing, and coordinated efforts that increase the cooperatives' reach and impact.

Finally, coffee cooperatives should regularly assess their performance measures to evaluate the effectiveness of their human capital initiatives. Setting clear goals, monitoring progress, and making necessary adjustments will ensure continuous improvement. Cooperatives should also take advantage of supportive government policies and programs that promote market access, sustainable practices, and human capital development. Encouraging favorable legislation will help create a conducive environment for cooperative growth and productivity, contributing to their competitiveness and sustainability in the global coffee industry.

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8. CONFLICTS OF INTEREST

The authors declare that there are no conflicts of interest.

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