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Overcoming the Liability of Smallness: Export Associativity and Hypothesis Testing in the Peruvian Alpaca Sector

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Abstract

Global trade dynamics create scale, financing, information, and technology challenges for Micro and Small Enterprises (MSEs), making inter-firm cooperation a potentially important mechanism for export participation. This study examines the structural and relational determinants of export-oriented business associativity among specialized alpaca-fiber garment MSEs in Arequipa, Peru. A quantitative, non-experimental, cross-sectional design with an explanatory-evaluative focus was applied to a complete census of 15 export-oriented MSEs participating in PROMPERÚ regional export articulation programs. Data were collected with a structured questionnaire containing 16 multi-item operational variables measured on a five-point Likert scale. Analytical procedures were conducted in IBM SPSS Statistics v.27 and combined heuristic Principal Component Factor Analysis (PCFA), Kendall's τ_b and τ_c non-parametric rank correlations, k-means cluster analysis, and exploratory discriminant analysis. PCFA indicated factorability of the census data (KMO = 0.714; Bartlett's test $\chi^2 = 142.36$, $p < 0.001$) and extracted three components explaining 72.2% of cumulative variance: Trust and Mutual Cooperation, Export Capacity and Vision, and Governance and Opportunistic Behavior. The hypothesis tests showed statistically significant positive associations between mutual trust and joint export performance ($\tau_b = 0.642$, $p = 0.008$) and between institutional leadership and joint export performance ($\tau_b = 0.589$, $p = 0.012$). Individual achievement orientation was not significantly associated with lower opportunistic behavior ($\tau_c = 0.215$, $p = 0.183$), while operational interdependency was not significantly associated with associative commitment ($\tau_b = 0.148$, $p = 0.363$). Cluster analysis identified High Associative Maturity (40%) and Reactive/Individualistic MSEs (60%). The results support an interpretation of associativity as a governance and social-capital problem as much as a resource-pooling problem. Given the census design and small population, the statistical findings are interpreted as evidence within the target stratum rather than as population-wide causal estimates.

1. Introduction

Micro and Small Enterprises (MSEs) occupy a central position in production and employment systems across developing and emerging economies, yet their internationalization is frequently constrained by structural heterogeneity. Compared with larger organizations, small firms usually operate with narrower production capacities, more concentrated managerial responsibilities, weaker bargaining positions, and fewer resources available for market intelligence, technological upgrading, and international compliance. These constraints become especially salient when an enterprise must respond simultaneously to buyer requirements, export logistics, certification procedures, payment risks, and minimum efficient order volumes. The result is a persistent tension: international markets can offer opportunities for higher-value sales and diversification, but the organizational resources required to reach those markets can be disproportionately difficult for a small firm to mobilize (Alvarado & Gomez, 2021; Boso et al., 2021; Felzensztein et al., 2022).

Inter-firm cooperation represents one response to this asymmetry. Business associativity allows independent firms to coordinate activities, pool selected resources, share information, and access

opportunities that would be difficult to pursue individually. In principle, such arrangements can preserve the legal and operational autonomy of participating firms while generating collective capabilities. In practice, however, cooperation is not automatic. The same firms that need one another for scale or market access may also have incentives to protect information, free-ride on collective investments, deviate from common standards, or appropriate shared commercial knowledge. Consequently, the sustainability of associative arrangements depends not only on the availability of complementary resources but also on the quality of governance and the social relations that regulate exchange (Omer & Saada, 2023; Gronum et al., 2022).

The Peruvian alpaca textile sector provides a particularly useful setting for studying this problem. Arequipa has a specialized concentration of firms linked to the processing and manufacture of alpaca-fiber products and benefits from the international recognition of Andean natural fibers and textile craftsmanship (Morales et al., 2022; Siles Neyra, 2018). This comparative advantage does not remove the organizational barriers faced by individual MSEs. Large international purchase orders may exceed the capacity of a single workshop, while buyer expectations concerning quality, continuity of supply, delivery schedules, traceability, and certification may require investments that are difficult to absorb individually (Prochazka & Zapata, 2023). Export consortia and trade networks promoted or supported by public institutions such as PROMPERÚ therefore appear as a mechanism through which firms can combine capabilities and coordinate access to external markets (PROMPERÚ, 2022).

The observed challenge is that associative initiatives can exhibit heterogeneous performance. Formal participation in a network does not necessarily produce effective cooperation. Previous evidence identifies member defection, free-riding, interpersonal friction, and weak internal governance as recurring problems in cooperative business structures (Guerra & Mendoza, 2024; Siles Neyra, 2018). This suggests that the analytical question is not simply whether association exists, but what relational, organizational, and institutional conditions make association workable. In particular, trust may reduce uncertainty, institutional leadership may create coordinating authority, and governance arrangements may constrain opportunism. Conversely, individual achievement orientation may coexist with self-protective or competitive behavior, while operational dependence may be insufficient to create a durable commitment to collective action.

The gap addressed by the present study lies at the intersection of these issues. Research on small-firm internationalization often emphasizes capabilities, access to infrastructure, or market conditions, but less attention is paid to the behavioral and governance mechanisms that determine whether firms transform proximity and interdependence into sustained collective action (Cespedes et al., 2023; Fernandez-Stark et al., 2022). This gap is particularly important in specialized regional clusters where the target population may be small, highly interconnected, and difficult to treat as a conventional large-sample setting. A complete population census can nevertheless provide meaningful evidence about the internal structure of the target stratum when statistical techniques are explicitly used in a heuristic and exploratory manner rather than as a basis for unrestricted generalization.

Accordingly, this study examines the structural determinants of business associativity and tests empirical propositions concerning trust, opportunistic behavior, interdependency, and institutional leadership among export-oriented alpaca textile MSEs in Arequipa. The study makes three related contributions. First, it brings behavioral and governance variables into the analysis of export associativity rather than treating cooperation as a purely resource-based response to scale constraints. Second, it uses a combination of factor reduction, non-parametric hypothesis testing, and clustering to characterize the internal structure of a specialized census group. Third, it translates the findings into implications for the design of export-consortium policies and firm-level governance practices. Because the study analyzes the complete target stratum of 15 export-oriented MSEs, the empirical results are interpreted primarily in relation to the organizations represented in the census, and claims of causality or broad external validity are deliberately avoided.

2. Theoretical Framework and Literature Review

2.1. The liability of smallness and the logic of associativity

The liability of smallness provides a useful starting point for understanding why small enterprises can experience persistent disadvantages in international markets. The concept captures the cumulative effects of limited resources, reduced scale, weaker legitimacy, and the concentration of decision-making within a small number of people. In an export context, these liabilities can interact. A firm with limited working capital may also lack the ability to invest in production equipment; the same firm may have insufficient personnel to manage market intelligence or certification; and the resulting capacity constraints can weaken its bargaining position with international buyers. Smallness therefore functions less as a single variable than as a configuration of mutually reinforcing constraints.

Associativity can be interpreted as an organizational response to that configuration. Instead of requiring each MSE to internalize every capability necessary for export growth, firms can selectively combine complementary assets and knowledge. One firm may possess specialized machinery, another design expertise, another a buyer relationship, and another experience with export documentation. A consortium can potentially convert these dispersed resources into a coordinated market offer. Yet resource pooling produces a governance problem because shared value must be allocated and safeguarded. The sustainability of cooperation therefore depends on whether participating firms perceive collective benefits as credible and whether coordination mechanisms are sufficiently reliable to prevent individual behavior from undermining the group.

The present study consequently treats business associativity as a relational governance phenomenon. Technical capacity and operational interdependency create opportunities for cooperation, but trust, institutional leadership, and mechanisms for controlling opportunistic conduct determine whether those opportunities are translated into stable associative commitment. This framing is consistent with evidence that inter-organizational networks in SMEs generate value when firms can access

complementary resources while maintaining mechanisms for coordination, reciprocity, and accountability (Agostini & Nosella, 2021; Dyer et al., 2021; Lavie et al., 2022).

2.2. Transaction Cost Economics

Transaction Cost Economics (TCE) is relevant because collaborative arrangements expose firms to exchange hazards that do not disappear merely because the parties are cooperating. Williamson's (1985) framework emphasizes bounded rationality and opportunism: parties cannot foresee every future state and may have incentives to pursue their own interests when agreements leave room for discretion. In export consortia, these risks may involve the disclosure of commercial information, disagreements about product quality, unequal effort, misuse of shared market contacts, or attempts to bypass common agreements. Each potential deviation generates monitoring, negotiation, and enforcement requirements.

From the TCE perspective, a consortium is therefore a hybrid governance arrangement rather than a simple association of firms. Its effectiveness depends on the capacity to reduce uncertainty through rules, monitoring, and credible consequences for non-compliance. Formal contracts are important but may not be sufficient. Relational norms can complement contractual provisions by creating expectations of reciprocity and by lowering the need for constant formal enforcement. Research on SME alliances similarly indicates that formal contracts and relational mechanisms can work together to constrain opportunism and protect collective value creation (Gronum et al., 2022; Mendoza-Silva et al., 2024).

This perspective helps explain why opportunistic behavior deserves explicit analytical attention. If the perceived risk that partners will defect, withhold information, or appropriate benefits becomes too high, firms may prefer to remain independent even when cooperation would generate operational advantages. Thus, the willingness to associate should not be inferred solely from the presence of resource dependence. The expected cost of governance and the perceived reliability of partners can alter the relationship between dependence and commitment.

2.3. Resource-Based View and relational capability

The Resource-Based View (RBV) argues that differences in firm resources and capabilities can produce differences in competitive performance (Barney, 1991; Grant, 1991). For small export-oriented firms, however, the challenge is that many strategically relevant resources are either unavailable internally or economically inefficient to duplicate. Relational capability extends the resource perspective by emphasizing that firms can access and combine resources through inter-organizational relationships. The relevant unit of analysis therefore becomes not only the firm but also the network through which firms obtain knowledge, market contacts, technical expertise, and complementary production capacity.

In the alpaca textile sector, this logic is particularly pertinent because production is specialized while international demand can be concentrated in orders that exceed the practical capacity of individual MSEs. Pooling production can create economies of scope or allow a group to respond to buyer requirements without requiring each firm to possess every technical capability. Similarly, shared export promotion can reduce duplication in market-development activities. The strategic value of associativity

thus arises from combining heterogeneous resources while preserving the entrepreneurial autonomy of participating organizations.

The relational view also clarifies why the creation of value does not guarantee its appropriation. A group may possess valuable complementary resources and still experience weak results if members cannot agree on how benefits are allocated or how joint assets are protected. Hence, RBV and relational capability theory explain the incentive to cooperate, while governance and social-capital theories help explain the conditions under which cooperation can persist (Dyer et al., 2021; Lavie et al., 2022; Zahra et al., 2023).

2.4. Social capital and network theory

Social capital theory emphasizes trust, shared norms, network relationships, and expectations of reciprocity as resources that facilitate collective action (Coleman, 1988; Putnam, 1993). In a cluster of small firms, social capital can reduce behavioral uncertainty because firms gain information about the reliability of potential partners through repeated interactions. Dense relationships can also support informal monitoring: deviations from expected conduct become more observable, and reputational consequences can supplement formal sanctions. Empirical studies of SME and artisan networks similarly link trust and network structures with cooperation and innovation (Agostini & Nosella, 2021; Cabrera & Ramos, 2023; Zhou et al., 2022).

This logic is particularly relevant where formal institutional enforcement is costly or slow. Relational governance can reduce the need for exhaustive contracts by creating shared expectations about quality, reciprocity, and information exchange. Nevertheless, social capital should not be romanticized. Dense networks can also reproduce exclusion or reinforce incumbent relationships. The analytical value of trust therefore lies in its function as a mechanism for reducing uncertainty and supporting collective action, not in the assumption that all network relationships are inherently beneficial.

Within the present research, trust and mutual cooperation are expected to represent a central associative dimension, while governance and opportunistic behavior capture the countervailing forces that can weaken collective action. Institutional leadership constitutes an additional bridge between social relations and formal coordination, particularly where public export-promotion organizations help organize commercial articulation.

2.5. Integrative analytical logic and hypotheses

Taken together, the three theoretical perspectives suggest that export associativity emerges from the interaction of resource needs, relational conditions, and governance mechanisms. TCE highlights the downside of opportunism and the need to safeguard cooperative exchange. RBV and relational capability explain why firms seek complementary resources through alliances. Social capital and network theory explain why trust, shared norms, and repeated interaction can make cooperation more predictable. The resulting analytical logic is therefore multidimensional: firms may have reasons to

associate because they need scale or capabilities, but they require relational confidence and governance capacity to convert that motivation into effective collective action.

The study's hypothesis testing focuses on four propositions that are especially visible in the empirical model: whether mutual trust is positively associated with joint export performance; whether institutional leadership is positively associated with joint export performance; whether individual achievement orientation is associated with reduced opportunistic behavior; and whether operational interdependency is positively associated with associative commitment. These propositions were examined through Kendall's rank correlations appropriate to the small, non-normal census group. The tests are treated as association tests, not as proof of causal mechanisms.

3. Research Methodology

3.1. Research design and analytical orientation

The study used a quantitative, non-experimental, cross-sectional design with an explanatory-evaluative orientation. The unit of observation was the executive owner or manager of a specialized alpaca garment MSE operating in Arequipa, Peru. The design sought to identify relationships among organizational and relational variables within a highly specialized export-oriented population rather than to manipulate conditions experimentally. This approach is consistent with the objective of examining how trust, opportunistic behavior, interdependency, institutional leadership, and associative performance coexist within an established regional business network.

The research was structured in sequential analytical stages. First, internal consistency of the measurement instrument was assessed. Second, Principal Component Factor Analysis (PCFA) was used heuristically to reduce the dimensionality of the 16 operational variables and identify broader patterns. Third, Kendall's τ_b and τ_c coefficients were used for non-parametric hypothesis testing. Fourth, k-means cluster analysis was used to classify firms according to associative profiles, followed by exploratory discriminant analysis to review the separation of the resulting groups. The sequence was designed to move from measurement coherence to dimensional reduction, association testing, and profile identification.

3.2. Population census and sample characteristics

Because the sectoral population was small and highly specialized, the study analyzed a comprehensive population census of N = 15 export-oriented MSEs participating in PROMPERÚ's regional export articulation programs in Arequipa (PROMPERÚ, 2022; Siles Neyra, 2018). The census therefore represented 100% of the identified target stratum. This is an important methodological feature because the study was not based on a probabilistic sample drawn from a much larger frame; instead, the accessible target population itself was enumerated.

The small size of the census necessarily constrains the interpretation of multivariate procedures. Conventional factor analysis, clustering, and discriminant methods are often associated with larger samples, and small samples can increase parameter instability and the risk of overfitting. The present study addresses this limitation by defining PCFA and clustering as heuristic and exploratory procedures, using them to identify structure within the observed group rather than to claim broad population generalization. Similarly, Kendall's rank correlations were selected because they do not require multivariate normality and are suitable for ordinal data and small samples (Siegel & Castellan, 1988).

Accordingly, the N = 15 census should be viewed as a strength for coverage of the defined target stratum but a limitation for external validity. The data provide a complete picture of the 15 firms included in the census, while the results should not be extrapolated automatically to all Peruvian textile MSEs, all alpaca firms, or export-oriented SMEs in other regions.

3.3. Data collection and instrumentation

Primary data were collected with a structured questionnaire containing 16 multi-item operational variables. All scale items were measured on a five-point Likert response format ranging from 1 = Strongly Disagree to 5 = Strongly Agree. The instrument was designed to capture behavioral, relational, organizational, and export-related dimensions relevant to business associativity. The questionnaire format made it possible to express qualitative perceptions as ordered responses suitable for non-parametric analysis while retaining a common metric across variables.

The instrument demonstrated an overall Cronbach's alpha of $\alpha = 0.884$ for the N = 15 census group. This coefficient indicates high internal consistency for the set of measured items. Because the study subsequently uses factor reduction, the reliability evidence was treated as an initial indication that the instrument contained sufficient shared variance to justify exploratory examination. Nevertheless, alpha is not interpreted as proof of unidimensionality; the PCFA was used to investigate whether the items formed coherent higher-order dimensions.

The measurement structure and data collection procedures were designed around the realities of specialized export-oriented MSEs. The questionnaire addressed issues of cooperation, export capability, organizational vision, governance, and potentially opportunistic conduct. The focus on executive owners and managers was intentional because these actors are directly involved in strategic coordination, partner selection, production commitments, and export decisions within small firms.

3.4. Analytical procedures

All statistical processing was conducted in IBM SPSS Statistics v.27. The analytical protocol consisted of four stages.

- Exploratory Principal Component Factor Analysis (PCFA). PCFA with Varimax orthogonal rotation was applied as a heuristic dimensionality-reduction procedure. The purpose was to identify the most coherent latent patterns across the operational variables within the census group. The

adequacy of the correlation matrix was assessed through the Kaiser-Meyer-Olkin (KMO) statistic and Bartlett's test of sphericity. The extracted components were interpreted substantively in relation to the theoretical framework and the observed associative context.

- Kendall's rank correlations for hypothesis testing. Kendall's τ_b and τ_c were selected because the variables were measured on ordinal Likert scales and the census was small. The significance threshold was fixed at α = 0.05. The coefficient values were interpreted as measures of direction and strength of association. Statistical significance was distinguished from causal inference: a significant coefficient indicates evidence of an association in the observed census, not that one variable experimentally produces changes in another.
- k-Means cluster analysis. Cluster analysis was used to segment the 15 MSEs into internally similar associative profiles. The resulting groups were interpreted substantively rather than as immutable organizational types. The cluster solution was used to support the descriptive characterization of associative maturity and reactive or individualistic orientations.
- Exploratory discriminant analysis. Discriminant analysis was used to review the separation properties of the cluster solution. Given the small census, the results were interpreted cautiously and not treated as an independent predictive model. No additional generalizable classification claim was made on the basis of this procedure.

3.5. Methodological safeguards and interpretation boundaries

Several interpretive safeguards are central to the study. First, the population census eliminates sampling error with respect to the defined target stratum, but it does not eliminate measurement error or guarantee transferability to other populations. Second, the use of multivariate exploratory techniques with 15 observations can reveal patterns but cannot substitute for the larger samples required for stable confirmatory modeling. Third, the significance tests are based on rank correlations and therefore describe monotonic associations rather than linear regression effects. Finally, the clustering analysis identifies group profiles inside the observed census and should not be understood as a validated taxonomy applicable to other sectors.

These boundaries are not peripheral methodological qualifications. They shape the level at which the findings can legitimately contribute to theory and practice. The principal value of the analysis is its ability to organize evidence from a complete, specialized group into empirically interpretable dimensions and associations. The findings can therefore inform subsequent studies and policy design while also identifying relationships that should be tested with larger samples in the future.

4. Empirical Results and Hypothesis Testing

4.1. Internal consistency and factorability

The measurement instrument produced an overall Cronbach's alpha coefficient of $\alpha = 0.884$ for the census group ($N = 15$). This result indicates a high degree of internal consistency across the operationalized questionnaire items and provides a reasonable basis for exploratory dimensionality analysis. Because the study is focused on a small and specialized population, the reliability coefficient is treated as descriptive evidence of measurement coherence within this group rather than as a population parameter for all alpaca-sector MSEs.

The correlation matrix was also sufficiently structured for heuristic factor reduction. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.714, while Bartlett's test of sphericity yielded $\chi^2 = 142.36$ with $p < 0.001$. These statistics support the mathematical factorability of the observed correlation matrix. In practical terms, the interrelationships among the measured variables were sufficiently patterned to warrant a dimensionality-reduction exercise despite the small census. The result should nonetheless be read as an exploratory representation of the specific group rather than a definitive latent structure established through confirmatory measurement modeling.

4.2. Heuristic Principal Component Factor Analysis

The PCFA with Varimax rotation extracted three principal components that together explained 72.2% of the total cumulative variance. The resulting structure was interpreted through three substantive dimensions: (1) Trust and Mutual Cooperation; (2) Export Capacity and Vision; and (3) Governance and Opportunistic Behavior. These dimensions provide a parsimonious organization of the variables surrounding business associativity in the observed firms.

The first dimension, Trust and Mutual Cooperation, emphasizes the relational foundation of association. Its prominence is consistent with the proposition that cooperative export activity requires more than physical proximity or economic complementarity. Firms must be willing to exchange information, coordinate actions, and rely on partners to perform agreed tasks. The factor therefore links social capital with the operational side of collective action: trust is not merely an interpersonal attitude but a condition that allows cooperation to occur without continuous defensive monitoring.

The second dimension, Export Capacity and Vision, captures the outward-looking rationale for associativity. Cooperation is connected to the ability to participate in export opportunities and to a managerial orientation toward sustained international activity. The dimension is consistent with the Resource-Based View and relational capability perspective because firms can expand their effective resource base through collaboration without fully internalizing every capability needed for internationalization.

The third dimension, Governance and Opportunistic Behavior, captures the countervailing tension between collective coordination and individual incentives. Associativity creates shared value but also creates potential opportunities for free-riding, defection, or appropriation of jointly generated benefits. The emergence of governance and opportunism as a distinct component supports the theoretical proposition that cooperative structures need institutional and relational safeguards.

Table 1
Heuristic dimensions identified by the PCFA. Note: the V3 manuscript reports the three dimensions but does not report individual factor loadings; no loading values have been added in this revision.

Dimension	Substantive interpretation	Theoretical linkage
Trust and Mutual Cooperation	Interpersonal reliability, reciprocity, willingness to coordinate and exchange information	Social capital and relational governance
Export Capacity and Vision	Collective ability and managerial orientation toward international market participation	RBV, relational capability, SME internationalization
Governance and Opportunistic Behavior	Rules, coordination, monitoring, and risks of self-interested deviation	Transaction Cost Economics

4.3. Hypothesis testing using Kendall rank correlations

Four core empirical propositions were evaluated using Kendall's non-parametric rank correlations. The results are summarized below. The coefficients and p-values are reproduced exactly from the V3 manuscript.

Table 2
Kendall rank-correlation results reported in the V3 manuscript. α = 0.05.

Proposition tested	Coefficient	p-value	Interpretation within the census
Mutual trust and joint export performance	τ_b = 0.642	0.008	Positive, statistically significant association
Institutional leadership and joint export performance	τ_b = 0.589	0.012	Positive, statistically significant association
Individual achievement orientation and opportunistic behavior	τ_c = 0.215	0.183	Positive association, not statistically significant
Operational interdependency and associative commitment	τ_b = 0.148	0.363	Weak positive association, not statistically significant

The strongest reported association concerns mutual trust and joint export performance (τ_b = 0.642, p = 0.008). The positive coefficient indicates that firms reporting stronger mutual trust also tended to report stronger joint export performance within the census. The statistical significance of the relationship is consistent with the social-capital proposition that relational confidence supports collective action. Importantly, the coefficient should not be interpreted as evidence that trust alone causes export performance. Because the design is cross-sectional and non-experimental, the direction of causality cannot be established; successful cooperation may itself strengthen trust, or both may be reinforced by unmeasured organizational conditions.

Institutional leadership also showed a statistically significant positive association with joint export performance (τ_b = 0.589, p = 0.012). This result is consistent with the view that collective action in

small-firm networks benefits from coordination mechanisms capable of organizing activities, clarifying expectations, and connecting firms with external support. Institutional leadership may be especially relevant when firms face an environment in which individual organizations lack sufficient administrative capacity to coordinate international market initiatives independently. Again, the result identifies association rather than causation and should be understood within the census group.

The proposition linking individual achievement orientation with lower opportunistic behavior was not supported by the reported data. The coefficient was positive rather than negative ($\tau_c = 0.215$), and the relationship was not statistically significant ($p = 0.183$). This finding is theoretically informative because it indicates that an entrepreneurial orientation toward individual achievement should not automatically be interpreted as a mechanism that stabilizes collective cooperation. Individual ambition may coexist with collaborative behavior, but it may also coexist with incentives to prioritize firm-specific interests. Within the observed census, the evidence is insufficient to conclude that individual achievement orientation reduces opportunistic conduct.

The association between operational interdependency and associative commitment was also not statistically significant ($\tau_b = 0.148$, $p = 0.363$). The coefficient is positive but weak, suggesting that dependence on other firms for operational activities did not, by itself, correspond to a clearly stronger commitment to association. This finding qualifies a purely resource-dependence interpretation of associativity. Firms may need one another operationally while still hesitating to formalize or deepen their collective commitment if trust is low, governance is uncertain, or the perceived risks of cooperation are high.

Taken together, the hypothesis tests point toward a distinction between necessity and commitment. Economic or operational interdependence can create a reason to cooperate, but the results indicate that relational and institutional conditions are more clearly associated with successful collective export activity in this census. The empirical pattern therefore complements the PCFA: the relational dimension is not only one of several descriptive factors; it is also connected to the observed performance outcome through the strongest statistically significant association reported in the study.

4.4. k-Means cluster analysis

The cluster analysis divided the 15 MSEs into two associative profiles. Forty percent of the firms were classified as High Associative Maturity, while 60% were classified as Reactive/Individualistic MSEs. The two-cluster solution provides a concise descriptive representation of heterogeneity in associative behavior within the census.

The High Associative Maturity profile is consistent with a stronger orientation toward collective mechanisms, relational confidence, and organized participation in joint export activities. In conceptual terms, these firms appear more compatible with the governance demands of a consortium: they are better positioned to combine resources, coordinate actions, and accept the institutional routines required for sustained joint market activity.

The Reactive/Individualistic profile represents the other side of the associative problem. The label does not imply a fixed organizational deficiency; rather, it captures a pattern in which firms may respond to opportunities or constraints individually and may be less consistently integrated into collective mechanisms. The predominance of this group (60%) indicates that associative participation cannot be assumed to be uniformly mature across the target stratum.

Because the census contains only 15 firms, the cluster solution is exploratory. The reported percentages are descriptive of the observed group and should not be interpreted as prevalence estimates for the broader Peruvian alpaca industry. The value of the analysis lies in making heterogeneity visible and in identifying a plausible distinction between firms that are institutionally and relationally prepared for sustained association and firms whose behavior remains more reactive or individual-oriented.

4.5. Exploratory discriminant review

Exploratory discriminant analysis was used to review the separation properties of the cluster solution. Given the size of the census, this procedure was deliberately interpreted as a descriptive check rather than as a predictive classification model. The analysis was not used to claim that the identified profiles can be reliably assigned to new firms outside the census. This cautious treatment is consistent with the methodological decision to use multivariate methods heuristically under severe sample-size constraints.

The combined analytical sequence nevertheless provides convergent descriptive information. PCFA identified three broad dimensions, Kendall correlations highlighted the particular relevance of trust and institutional leadership, and clustering demonstrated that firms differ in their overall associative profiles. The findings therefore support a coherent interpretation of associativity as a multi-dimensional organizational phenomenon involving resources, relational capital, and governance.

5. Discussion

5.1. Trust as a condition for collaborative export performance

The statistically significant association between mutual trust and joint export performance is consistent with the central role assigned to social capital in inter-organizational cooperation. In a consortium, firms expose themselves to a degree of mutual dependence: production schedules may become coordinated, commercial information may circulate across organizational boundaries, and each member's conduct can affect the reputation of the collective. Trust reduces the expected uncertainty surrounding these exchanges because it increases confidence that partners will perform according to shared expectations.

This interpretation does not imply that formal governance is unnecessary. On the contrary, TCE predicts that even cooperative partners require mechanisms for safeguarding exchange when opportunism is possible. Trust can lower the need for defensive behavior, while formal rules establish minimum expectations and consequences. The combination of relational and formal governance is therefore more

consistent with the evidence than either extreme. A consortium based only on informal goodwill may be vulnerable when stakes increase, whereas a highly formalized arrangement without relational legitimacy may generate high monitoring costs and limited commitment.

The result also has implications for how export support programs are designed. Training that focuses exclusively on technical export procedures may increase individual capabilities without necessarily resolving the relational barriers that prevent collective execution. Programs that facilitate repeated interaction, transparent information exchange, joint problem-solving, and negotiated operating rules may contribute to the formation of the social capital required for sustained association.

5.2. Institutional leadership and the coordination problem

The positive and statistically significant association between institutional leadership and joint export performance reinforces the role of coordination beyond the firm level. Small firms often lack specialized administrative structures, and this may increase the coordination burden involved in collective export activity. Institutional leadership can partially address that problem by providing procedural continuity, linking firms with external institutions, organizing market-facing activities, and supporting the establishment of shared rules.

The result is compatible with the idea of institutional leadership as an enabling mechanism rather than as a substitute for firm-level agency. A public or intermediary institution can convene firms and lower coordination barriers, but it cannot manufacture trust or guarantee compliance indefinitely. Sustainable associations ultimately require participating firms to internalize routines for decision-making, information sharing, benefit allocation, and conflict management.

From a policy perspective, this means that support institutions should be evaluated not only by the number of firms trained or events attended but also by whether interventions produce durable associative capabilities. A consortium that exists administratively but lacks internal governance may remain vulnerable to defection. Institutional support is therefore most useful when it creates conditions under which firms can gradually assume greater responsibility for their collective governance.

5.3. Achievement orientation does not automatically reduce opportunism

The non-significant relationship between individual achievement orientation and opportunistic behavior complicates an intuitive assumption that highly motivated entrepreneurs will necessarily become stronger cooperative partners. Entrepreneurial ambition and cooperative reliability are not equivalent constructs. A manager can be strongly motivated to expand, take risks, and outperform competitors while still preferring to retain information or prioritize individual firm gains when collective benefits are uncertain.

This distinction is theoretically consistent with TCE. Opportunism concerns the pursuit of self-interest with guile, whereas achievement motivation concerns goal intensity or persistence. The first is a

governance risk; the second is a motivational orientation. The fact that individual achievement orientation did not significantly predict lower opportunistic behavior in the census suggests that policy or management interventions should not assume that motivated entrepreneurs will spontaneously converge on collective norms.

Instead, associative arrangements may need explicit mechanisms that align individual and collective incentives. Clear membership rules, transparent information, agreed standards, and procedures for dispute resolution can reduce the scope for opportunistic conduct while allowing entrepreneurial ambition to contribute to shared objectives.

5.4. Operational interdependency is necessary but insufficient

The weak and non-significant association between operational interdependency and associative commitment is one of the most informative findings for the study's conceptual model. Resource dependence and functional complementarity can create objective reasons for firms to interact, but dependence alone may not create psychological or institutional commitment. In other words, needing another firm is not the same as trusting it, and operational coordination is not identical to a durable willingness to remain in an association.

This distinction has practical importance in regional clusters. Firms may collaborate when a particular export order requires additional capacity and then return to individual behavior once the immediate constraint disappears. Such episodic cooperation may generate short-term benefits without producing the governance routines and relational capital needed for sustained collective action. The cluster analysis supports this interpretation by showing that a majority of firms were classified in the Reactive/Individualistic profile, while a smaller group displayed High Associative Maturity.

The evidence therefore suggests that associative policy should distinguish between temporary cooperation and organizationally embedded associativity. The latter requires repeated interaction, credible rules, shared strategic objectives, and mechanisms for resolving the conflicts that arise when firms have both collective and individual interests.

5.5. Theoretical contribution

The study contributes to the literature by connecting three explanatory lenses that are sometimes treated separately. TCE explains why opportunism creates a governance challenge; RBV and relational capability theory explain why firms have incentives to access complementary resources through alliances; and social capital theory explains how trust and network relations can reduce uncertainty and support collective action. The empirical evidence is consistent with a model in which none of these perspectives is sufficient alone.

The strongest associations reported in the study are relational and institutional rather than purely operational. Trust and institutional leadership are statistically related to joint export performance, while

operational interdependency alone is not significantly related to associative commitment. This pattern suggests that the transition from structural dependence to effective collaboration is mediated conceptually by governance and relational mechanisms. The research therefore reframes the liability of smallness from a purely resource shortage problem into a collective organization problem: small firms may overcome scale constraints when they can coordinate resources through reliable institutions and relationships.

At the same time, the study's theoretical contribution must be bounded by its design. The findings do not establish a general causal model of SME associativity and do not provide estimates that can be transferred automatically to other populations. Instead, the study identifies an empirically coherent structure within a complete specialized census and provides propositions for larger-sample research.

6. Practical and Institutional Implications

6.1. Implications for MSE managers and export consortia

At the firm level, the results suggest that consortia should treat trust and governance as operational assets. Joint export activity involves decisions about quality, delivery, pricing, information, and customer relationships. These decisions create interdependence and therefore require transparent procedures. Consortium rules should define responsibilities, minimum service standards, information-sharing expectations, and mechanisms for addressing non-compliance.

A practical governance architecture can combine formal rules with relational routines. Formal agreements can clarify how orders are allocated, how shared expenses are recorded, how quality deviations are treated, and how disputes are escalated. Relational routines can include regular coordination meetings, shared production planning, and transparent reporting. The objective is not to eliminate individual autonomy but to make collective behavior predictable enough for joint commitments to be credible.

The findings also support investing in collective export capabilities. Shared market intelligence, technical learning, trade-fair participation, quality management, and export documentation can be organized collectively where individual firms face prohibitive duplication costs. The advantage of such collaboration depends on the governance capacity to ensure that collective investments are not disproportionately captured by a small subset of members.

6.2. Implications for public export-promotion institutions

The significant association between institutional leadership and joint export performance suggests that public and intermediary institutions can play a meaningful coordinating role. PROMPERÚ and related organizations can facilitate structured interactions among MSEs, help standardize associative procedures, and create opportunities for repeated collaboration. The objective should be to build institutional capacity within the association rather than to maintain permanent external dependence.

Policy instruments can therefore be designed around milestones of associative maturity. Early-stage initiatives may focus on trust-building, partner identification, shared diagnostics, and governance training. More mature associations can receive support for collective market access, technical upgrading, and export promotion. Such sequencing recognizes that firms differ in their readiness to cooperate, a pattern reflected in the two cluster profiles identified by the study.

Because the target population is specialized, interventions should also acknowledge the particularities of the alpaca value chain. Support for MSEs cannot be limited to firm-level productivity if the principal constraint is the coordination required to translate complementary capacities into a reliable export proposition. Institutional programs should therefore combine capacity development with mechanisms that strengthen the organizational architecture of associations.

7. Limitations and Directions for Future Research

The most important limitation is the size and scope of the census. Although N = 15 represents the complete identified target stratum of export-oriented alpaca garment MSEs participating in the specified PROMPERÚ regional programs, it is too small to support broad statistical generalization. The multivariate procedures were therefore used heuristically. Future research should replicate the conceptual model with larger samples covering additional alpaca producers, textile firms, regions, and export-program participants.

A second limitation concerns the cross-sectional and non-experimental design. The observed relationships cannot establish temporal precedence or causality. For example, trust may contribute to successful cooperation, but successful cooperation may also increase trust. Longitudinal designs could examine whether associative maturity develops over time and whether institutional interventions produce changes in trust, opportunistic behavior, and export performance.

A third limitation is the reliance on self-reported measures collected through a structured questionnaire. Although the instrument showed an overall Cronbach's alpha of $\alpha = 0.884$, perceptions of cooperation, governance, and performance may be influenced by respondent interpretation. Future studies can strengthen evidence through multiple informants per firm, objective export records, consortium administrative data, and longitudinal performance indicators.

A fourth limitation concerns the exploratory use of factor and cluster methods. The PCFA identified three coherent dimensions, but the V3 manuscript does not report item-level factor loadings, communalities, or full extraction diagnostics. Similarly, the cluster analysis reports the final profiles but not the complete distance matrix or classification diagnostics. These omissions do not invalidate the reported descriptive findings, but they limit the reproducibility of the detailed multivariate structure. The supplementary technical materials should therefore provide the underlying matrices, coding scheme, and SPSS outputs made available to the editors and reviewers.

Finally, future studies should compare associative structures across sectors and institutional environments. The mechanisms observed in alpaca textiles may differ from those in food processing, metalworking, tourism, or other export clusters. Comparative research can determine whether trust and institutional leadership consistently predict collaborative export outcomes or whether their relative importance depends on sectoral technology, buyer concentration, institutional quality, or the maturity of the firms involved.

8. Conclusion

This study examined export-oriented business associativity among a complete census of 15 specialized alpaca garment MSEs in Arequipa, Peru. Using a quantitative, non-experimental and cross-sectional design, the research combined heuristic PCFA, Kendall rank correlations, k-means clustering, and exploratory discriminant analysis to investigate the structure and correlates of associative behavior.

The analysis identified three dimensions—Trust and Mutual Cooperation, Export Capacity and Vision, and Governance and Opportunistic Behavior—and produced four reported hypothesis tests. Mutual trust was positively and significantly associated with joint export performance ($\tau_b = 0.642$, $p = 0.008$), as was institutional leadership ($\tau_b = 0.589$, $p = 0.012$). Individual achievement orientation was not significantly associated with reduced opportunistic behavior ($\tau_c = 0.215$, $p = 0.183$), and operational interdependency was not significantly associated with associative commitment ($\tau_b = 0.148$, $p = 0.363$). The cluster analysis further indicated two descriptive profiles: High Associative Maturity (40%) and Reactive/Individualistic MSEs (60%).

The central implication is that export associativity should not be understood solely as an answer to resource scarcity. Structural interdependence can create reasons to cooperate, but sustainable cooperation also depends on trust and governance arrangements capable of reducing uncertainty and aligning individual and collective interests. For the Peruvian alpaca sector, strengthening associative institutions therefore involves social-capital construction, transparent rules, and durable coordination mechanisms as well as technical and market support.

Because the study is based on a small complete census, its main contribution is analytical and exploratory rather than a claim of universal causal inference. The results provide an empirically grounded basis for subsequent larger-sample research and for more targeted approaches to export-consortium development in specialized regional clusters.

Declarations

Funding Declaration

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Competing Interests

The authors declare no competing interests.

Ethics Declaration

Ethical approval:

The research protocol, survey instruments, and census data-collection procedures were formally reviewed and approved by the Research Ethics Committee and the Academic Directorate of Business and Economic Sciences at the Catholic University of Santa María, Arequipa, Peru, in accordance with institutional academic research standards.

Informed consent:

Informed consent was obtained from all participating executive owners and enterprise managers before their inclusion in the study. Participants were informed of the academic purpose of the research, the voluntary nature of participation, and the confidentiality and anonymization of organizational and financial responses.

Author Contribution

M.O.S.N. conceptualized the study, developed the methodology, conducted the formal analysis, and wrote the main manuscript text. F.D.S.N. conducted the investigation, curated the data, and contributed to writing, reviewing, and editing the manuscript. E.L.V.B. was responsible for validation, resource acquisition, and project administration. P.I.M.O. supervised the research, managed the software, and prepared the figures. All authors reviewed the manuscript.

Data Availability Statement

The complete dataset, including raw survey responses from N = 15 export-oriented micro and small enterprises (MSEs) in the Peruvian alpaca textile sector, is provided as Supplementary Material accompanying this submission. The supplementary file contains: (1) the processed dataset in Excel format with all 16 measured variables; (2) the structured questionnaire and data-collection protocol; (3) variable definitions and coding information; and (4) supporting statistical analysis documentation from IBM SPSS Statistics v.27.

All identifying organizational information has been removed from the publicly shareable dataset to preserve confidentiality and comply with research ethics requirements. The anonymized dataset,

questionnaire, and analysis protocol are sufficient to verify and fully reproduce all reported empirical results, including the principal component factor analysis, Kendall rank-correlation hypothesis tests, and k-means cluster analysis. For direct access to the supplementary materials and full dataset, readers may contact the corresponding author (M.O. Siles Neyra, msiles@ucsm.edu.pe) or request the materials through the journal's data-availability portal.

Compliance with regulations: All research procedures and empirical data collection were conducted in accordance with the relevant institutional and social-science research requirements and the ethical principles outlined in the Declaration of Helsinki.

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- AlpacaSectorExportAssociativityData2.xlsx