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Collaboration on the quality of the business relationship with the supplier and its effect on innovation

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Abstract

Objective: The central purpose of this research establishes the mediating influence of collaboration to innovate at the nexus between superior quality business relationships and innovation in processes and products, considering its impact on the supply chain. **Method:** The study analyzed data using structural equations (PLS-SEM) to discern direct and indirect effects and their significance. Explained variance (VAF) was evaluated to determine the mediating effect in 250 Colombian agribusinesses through a structured questionnaire. **Results:** It was found that co-innovation exhibits a positive and partial mediating effect between the quality of the commercial link and the degrees of process and product innovation in productive organizations. **Discussions:** Collaboration, the result of close business ties based on relationship marketing, generates the adoption of innovations for those involved, results that are difficult to achieve individually. **Conclusions:** The results allow us to further explore how trade relations are sources of innovation in the agricultural sector to promote greater regional competitiveness.

Keywords: Co-innovation, Relationship marketing, Supply chain,

JEL Classification: M31 Marketing, L15 Product Information and Quality • Standardization and Compatibility, J43 Agricultural Labor Markets

Introduction

Relationship marketing, conceived as the set of strategies and business actions focused on the creation and consolidation of lasting bonds with customers, gives paramount importance to the relationship as a backbone of interconnections in the medium and long

term. This perspective makes it easier for the parties involved in commercial transactions to develop joint initiatives aimed at generating assets whose ultimate goal is shared benefit (Makkonen et al., 2016; Manser et al., 2016; Šonková & Grabowska, 2015).

These relationships, when they are mainly based on aspects of a non-monetary nature, are usually classified as "solid" or "strong", fostering a perception of mutual trust among the actors participating in the transactional process. Within these exchange scenarios, framed in the construction of relational capital, the achievement of predefined objectives becomes more viable thanks to the active collaboration of those involved in the transaction (Sheth, 2017), which encourages commercial counterparties to be considered as strategic partners with common interests, as opposed to being seen as direct rivals. From this last perspective, collaboration manifests itself as a direct consequence of a robust or high-quality commercial relationship, transcending towards the formulation of joint actions that could imply the allocation of shared resources between the parties involved, whose central purpose is collective well-being. This well-being, in turn, results in the development or adoption of significant innovations among the participants (Gulati et al., 2000; Skinner et al., 1992; Wilson, 1995). In this sense, the analysis of innovation within the context of business relationships necessarily requires an understanding of how collaboration influences the levels of technological advancement that an organization can achieve.

Considering the intrinsic relevance of relationship marketing in change management and adaptation to new scenarios, this study proposes a structural model that establishes a connection between the quality of the commercial relationship and technological innovation, assigning collaboration a crucial mediating role. The primary objective is to empirically demonstrate whether those organizations that actively develop collaborative actions with their suppliers manage to achieve higher levels of innovation both in their operational processes and in their final products, compared to those that do not implement this type of joint strategies. To evaluate the specific contribution of collaboration to innovation (co-innovation), the technique of structural equation modeling using the partial least squares method (PLS-SEM) is used, which is based on the analysis of variance to establish the existing interrelations between the different theoretical constructs. As a complement to this analysis, the bootstrapping technique is used in order to determine the statistical significance of the mediation effects identified (Henseler et al., 2009). Finally, in order to examine the explanatory power and predictive capacity of the model incorporating the mediating variable, the PLS-SEM and blindfolding methodologies are implemented, whose results are contrasted with those obtained in a model that excludes the mediation variable.

Theoretical foundation

The idea of commercial relationship covers a wide spectrum in the specialized literature, integrating both the direct interactions of exchange and the intangible dimensions that sustain them. However, relationship-focused customer management strategies prioritize the latter non-monetary aspects, such as the quality of interpersonal treatment and synergistic cooperation, considering them pillars for the achievement of organizational goals. In the context of agricultural enterprises, for example, access to sources of

innovation stands as a critical factor in bridging the technological gap that separates them from other economic sectors, thereby boosting their ability to compete effectively.

In this sense, it is essential to analyze the commercial connections that producers establish with the various agents that make up the supply chain, particularly in the territorial area. These linkages generate valuable opportunities for the transfer of knowledge and experiences, which in turn fosters the continuous improvement of their production processes and the evolution of their product offerings (Dries et al., 2014; Haberli et al., 2017; Siriwongwilaichat & Winger, 2004). This phenomenon is part of the process of building a crucial intangible asset: relational capital.

An organization's relational capital derives from the web of its social interactions, including those where commercial interests converge. Previous research on this concept has explored collaboration and its catalytic impact on innovation, demonstrating the significant influence that interorganizational interactions exert on strengthening the firm's competitive advantages (Laursen et al., 2012; Thi Mai Anh et al., 2019). Figure 1-1 illustrates a model that represents the interorganizational dynamics originating in their relational capital and how each type of interaction modulates the type of innovation that can materialize.

Within the supply chain, commercial relationships represent favorable scenarios for organizations to cultivate relational capital (Dries et al., 2014). The buyer-supplier dyad, based on mutual respect, mutual trust and proximity in interaction, promises tangible benefits for both parties, such as the optimization of operating costs, greater agility in responding to changes in the environment, the reduction of delivery times and the promotion of the development of new products and services (Cousins et al., 2006). This perspective of relational capital in the context of the organizational supply chain is intrinsically linked to the technological progress that a specific sector can achieve, given the producer's dependence on the knowledge that emanates from its relational links (Berdegué, 2005). That is, the existence of a direct connection between the producer's ability to acquire knowledge of its customers, suppliers and/or strategic allies (Delgado-Verde et al., 2011) and its ability to implement adjustments in its processes and renew its product portfolio, thus ensuring its permanence and relevance in the market. In this way, relational capital is consolidated in organizations as a primary source of innovation, emanating from collaboration and/or cooperation initiatives, which is coherently aligned with the systems approach proposed by Röling and Engel (1991).

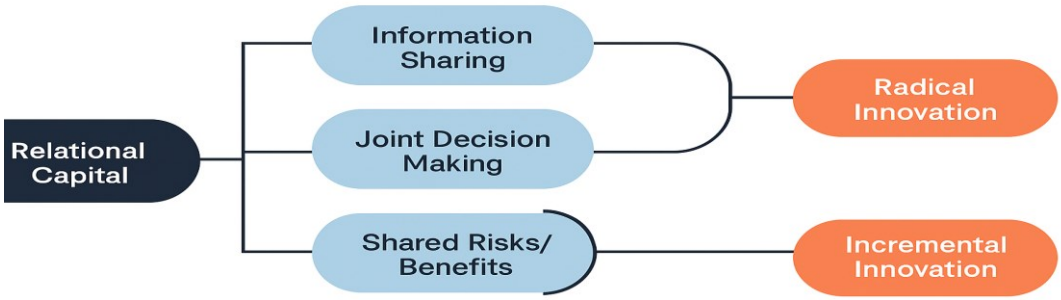

Figure 1 Relational capital and its effects on innovation

Note: This figure is proposed by Thi Mai Anh et al., (2019).

From the perspective of the supply chain, where the network of external collaborators, and particularly suppliers, are recognized as agents that modulate **innovation**, organizations adopt a vision of systemic integration and the construction of collaborative networks. In this framework, **innovation** is conceived as a process of knowledge aggregation intimately linked to factors both in the environment and internal to the company. An illustrative example is the "fifth-generation model" proposed by Rothwell, which describes these flows of knowledge, evidencing the dependence of the organization on its network for the assimilation of new transformations (Rothwell, 1994).

In this scenario of interconnections, suppliers play a transcendental role in the development of **innovations**. These contexts of knowledge exchange are often influenced by the robustness achieved by the **commercial relationship**, which usually translates into higher levels of trust and commitment, among other distinctive values of a quality relationship, in line with the principles of **relationship marketing** postulated in the literature. These elements foster environments conducive to **innovation** through joint work (Addison et al., 2017; Arosa-Carrera & Chica-Mesa, 2020; Nandonde & Kuada, 2018; Parry & Westhead, 2017).

The high levels of quality in the relationship between producers and suppliers foster perceptions of equity in trade and encourage participants to explore interactions that transcend mere economic benefit, thus making suppliers willing to undertake joint activities in search of mutually advantageous results, some of them with a long-term vision (Abdelkafi & Pero, 2018; Gao et al., 2017; Šonková & Grabowska, 2015). In essence, this implies a predisposition to co-innovation.

The theoretical discussion around co-innovation suggests analyzing collaboration and its manifestation in trade relations from a vertical integration perspective (Belderbos et al., 2004). Figure 2-5 illustrates the various forms of collaboration that organizations can access. Collaboration usually emerges when trading partners have evolved into robust relational states, involving the participation of the actors involved through the allocation of resources and efforts to achieve market objectives (Skinner et al., 1992; Wilson, 1995).

Collaboration, also referred to by some authors as cooperation (Hammervoll, 2009), is based on voluntary reciprocity between organizations, which allows them to undertake joint actions, such as the development of products or the implementation of novel technologies (Gulati et al., 2000). In certain cases, these efforts are formalized through contracts or agreements defined within organizational structures, creating an interdependence based on a framework of shared values, based on trust and mutual commitment among the participants in the transaction (Anderson & Narus, 1990; Deepen et al., 2008; Mehta et al., 1996; Morgan et al., 1994).

Vertical collaboration is examined from the perspective of the supply chain. In this context, the central organization develops joint activities with its business partners, thus contributing to strengthening the quality of the relational bond and, simultaneously, taking advantage of the sources of knowledge available in its network to promote innovations in processes and products (Clauss & Bouncken, 2019; Freel, 2003; Najafi-Tavani et al., 2018).

The knowledge shared among participants in collaborative projects facilitates the adoption of new and/or improved actions in organizational processes. This is based on the premise that the benefits obtained, which allow us to overcome technological gaps and achieve a certain level of competitiveness, are only viable through collaboration. Individually, such benefits would be unattainable or would imply a high risk that the organization alone could not assume (De Silva et al., 2018; Lichtenthaler & Ernst, 2008; Wang & Hu, 2020).

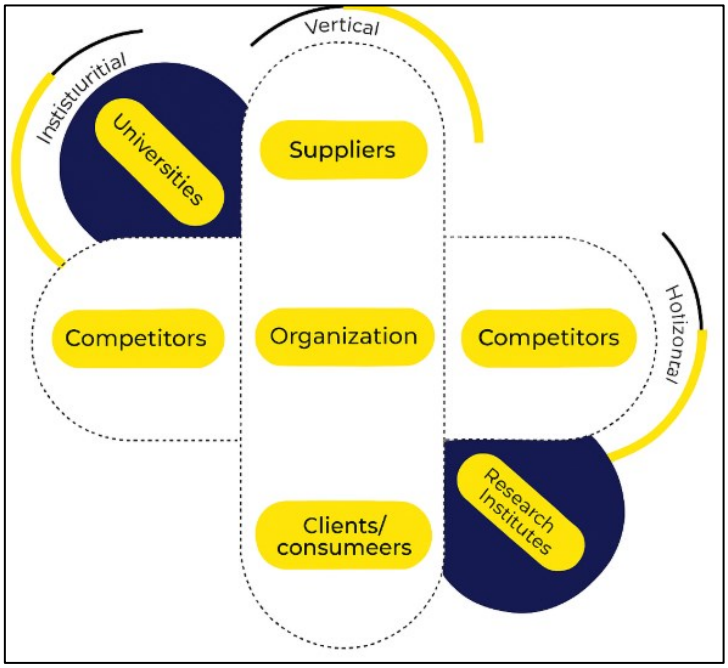

Figure 2 Collaboration Perspective
Note: Prepared from Belderbos et al. (2004)

In this context, when collaboration is oriented towards the exchange and expansion of knowledge, a theoretical conceptualization emerges, recognized in the literature as co-

innovation in commercial relations. This is defined as the willingness of trading partners to interact, share knowledge, and address challenges together, with the aim of implementing innovations that generate mutual benefits (Najafi-Tavani et al., 2018; Nordman & Tolstoy, 2016; Yuan et al., 2019).

Co-innovation, therefore, can manifest itself vertically and top-down with suppliers when, through business dynamics, innovations are implemented that favor the parties involved and that, naturally, translate into superior results, especially with regard to competitiveness (Shen et al., 2021).

These practices of vertical collaboration in the territories are framed within the studies of the supply chain, which include top-down relationships; that is, those that are established with suppliers. In this process of commercial exchange, collaborative work is recognized as part of social capital, constituting one of the main sources for obtaining or developing technological innovations due to its accessibility in the local environment (Aguilar-Ávila et al., 2020; Clauss & Bouncken, 2019; Freel, 2003; Najafi-Tavani et al., 2018).

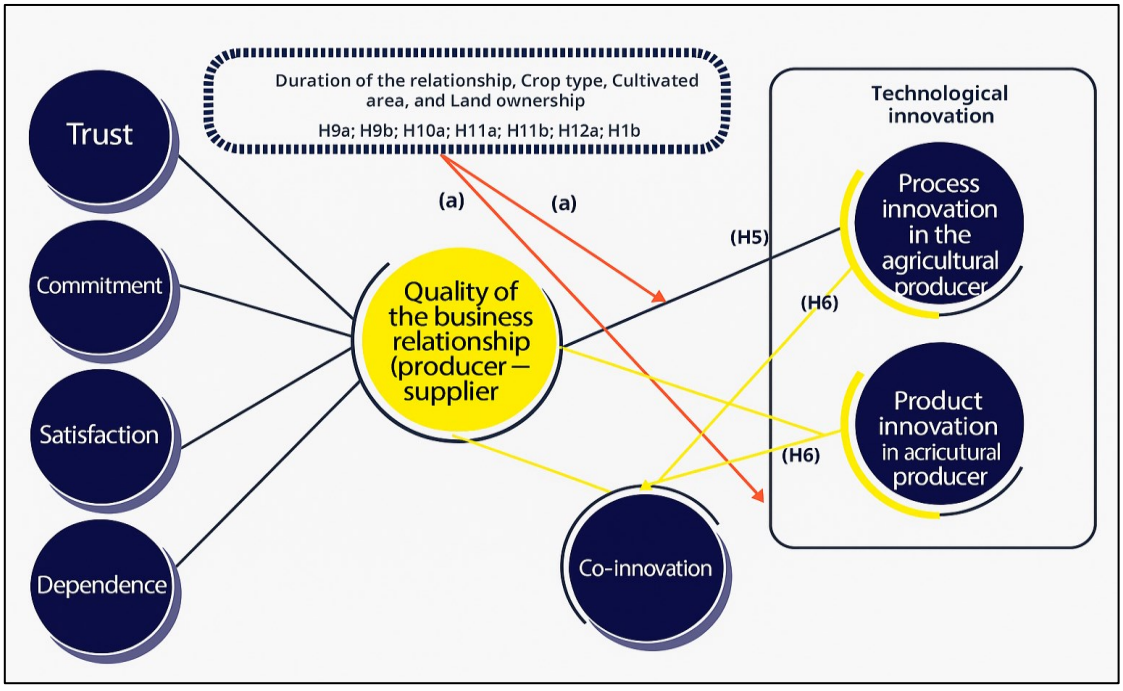

Figure 3. Relationship between farmer and supplier
Own elaboration

As a result of the above, the concept of collaboration to innovate emerges, whose performance as a dynamic factor facilitates the improvement of the levels of technological innovation in organizations based on their commercial links with suppliers. This is because, through collaboration, the parties involved develop joint actions, make shared investments and exchange knowledge about the market and its trends, among other elements that directly influence the creation of new or improved processes and products (De Silva et al., 2018; Lichtenthaler & Ernst, 2008; Najafi-Tavani et al., 2018; Nordman &

Tolstoy, 2016; Wang & Hu, 2020; Yuan et al., 2019). In this sense, collaboration for innovation is evident in producers through the adoption of technologies that benefit participants in commercial exchange, facilitated by their relationships with suppliers (Shen et al., 2021). According to the literature, collaboration to innovate acts as a mediator between the quality of the agricultural producer's commercial relationship with its supplier and innovation (see Figure 3).

Method

Design

The methodological design of this research is ascribed to a hypothetical-deductive approach, which proposes the formulation of conjectures based on the existing theory, susceptible to empirical verification. Its nature is quantitative, adopting an explanatory modality (Saunders et al., 2016). In coherence with the above, this study follows an ex post facto field design, of a non-experimental nature, whose application allows the identification of the interrelations between the variables in a context where they have already occurred and are not directly manipulated by the researcher (Kerlinger & Lee, 2002). These cross-sectional observations made it possible to evaluate the theoretical proposal in terms of its predictive potential. For this purpose, the technique of structural equation modeling is used, through which multivariate analyses are performed. However, since the proposed model has not been previously validated, its essential nature is exploratory, placing it in an evaluation phase that requires greater flexibility in the classical assumptions that traditional structural equations usually demand.

For the processing of the data collected, the structural equation technique implemented through the partial least squares method (PLS-SEM) is used, whose interpretation was carried out considering the magnitude of the effects, their statistical significance determined by the bootstrapping method, and their predictive capacity evaluated with the blindfolding technique (Barón & Kenny, 1986; Zhao et al., 2010). The analytical procedures were based on SmartPLS3 software (Ringle et al., 2015).

The steps followed for the assessment of the mediation effects were developed in accordance with the methodology described by J. F. Hair et al. (2022):

- **Assessment of the external or measurement model:** In order to establish the reliability and validity of the scales used in the structural model, factor load analyses, determination of composite reliability and calculation of the mean variance extracted (AVE) on the different variables were carried out, which were previously adapted and evaluated. These indicators make it possible to determine whether the scales actually measure the latent construct and, therefore, to establish their suitability to assess the contribution of **collaboration to innovation**.
- **Analysis of direct and indirect effects:** Using the PLS-SEM technique, indirect and direct effects were recorded, which made it possible to determine the existence and type of mediation present. Similarly, statistical significance and confidence interval were established through the *bootstrapping method* with 5,000 subsamples.

- **Formulation of hypotheses:** The following two research hypotheses were proposed:
    - **H1:** Collaboration **to innovate** acts as a mediating factor between the quality of the business relationship with the supplier and the **process innovation** developed by the agricultural producer.
    - **H2:** Collaboration **to innovate** acts as a mediating factor between the quality of the commercial relationship with the supplier and the **product innovation** developed by the agricultural producer.

These hypotheses were evaluated by mediating effect analysis, using explained variance (VAF) as an indicator. A VAF value greater than 20% was considered necessary to conclude that the **co-innovation variable** plays a significant mediating role between the quality of the business relationship and **technological innovation** (Hair et al., 2017).

- **Analysis of the coefficient of determination R^2:** This indicator was used to evaluate the explanatory capacity of the model by incorporating the mediating effect, allowing its result to be compared with the model without mediation. It was considered that R^2 values greater than 0.20 in both models were necessary to establish the existence of a substantial explanatory capacity in the structural models. This indicator was obtained using the PLS-SEM technique.
- **Determination of predictive relevance Q^2:** This indicator evaluated the predictive power of the model outside the sample. In this case, the impact of the mediating variable on endogenous variables was analyzed. Q^2 values greater than "0" were considered acceptable, while values less than "0" indicated a lack of predictive relevance. This indicator was obtained using the *Blindfolding* technique with a default distance (D) value of 7 (Hair, 2012), allowing the comparison of predictive power between the models.

Participants

The selection of the sample was carried out by means of a non-probabilistic sampling for convenience, made up of producers from the agricultural sector. However, in no case was the total number of units of analysis less than five for each indicator in the assessment of the measurement model. In any case, for the estimation of the structural model, the sample included more than 200 observations, which satisfies the essential technical requirements for the application of structural equations with the PLS technique (Ruiz et al., 2010). Given the need to have comparable sets, variables such as the type of crop, the land tenure regime, the extension of the farm, the length of the commercial relationship, among other attributes typical of agricultural production companies, were considered in the selection of the cases. The purpose of this selection criterion was to form a heterogeneous sample that would allow for a greater depth of analysis.

In this context, the population object of this research is composed of 250 agribusinesses dedicated to agricultural production, whose activity is carried out autonomously with respect to their suppliers. These present diversity in terms of the types of crops (transitory or permanent) and in relation to the time of the company's history in the development of its economic activity. No particular conditions were established in addition to being an agricultural producer and responsible for the

decisions that impact their crop. In organizations of greater complexity, the informed person, responsible for the crop and/or participant in the decision-making process inherent to it, was identified and taken as the main source of information. For the evaluation of the hypotheses raised, a sample of 250 agricultural producers located in the department of Meta (Colombia) was defined.

Instruments.

The information was collected directly through a structured form. The measurement scales of the various variables that make up the theoretical model were adapted and validated in this research using a preliminary sample of producers. For the scales corresponding to innovation and the quality of the commercial link, the proposals of Arosa, Dakduk and Chica (2021; 2022) were used, which are applied to the commercial relationships sustained in the supply chain between farmers and their suppliers. The indicators that make up the observable variables of the scale offer response options in a Likert format, whose ratings range from "Completely disagree (1)", indicating that the producer considers the statement false, to progressively advance to "Completely agree (7)", where the producer states that the statement fits his reality. These assessments reflect a specific level of development with respect to the indicator and, as a whole, towards the variable and the construct. Table 1 details the scales used.

Table 1. Reliability and reliability

Measurement Model		Cronbach's alpha	rho_A	Composite reliability	Mean extracted variance (AVE)
Quality of the Business Relationship	**Confidence**	0.874***	0.879***	0.914***	0.725***
	Satisfaction	0.809***	0.815***	0.875***	0.637***
	Dependence	0.892***	0.907***	0.933***	0.824***
	Commitment	0.893***	0.894***	0.926***	0.759***
Model 3 (Two-Dimensional)	**Process Innovation**	0.773***	0.785***	0.854***	0.595***
	Product Innovation	0.853***	0.855***	0.901***	0.695***

Note: Authors; p<0.001; **P<0.01; * p<0.05.

Results

Table 2 presents the key indicators that make it possible to determine the consistency of the external measurement model, through three fundamental criteria: 1) factor loads, whose ideal value is above 0.7; composite reliability, considered admissible if it meets or exceeds the threshold of 0.7; and, finally, the average variance extracted (AVE), whose value must exceed 0.5. The satisfaction of these criteria allows the measurement scale used to be validated.

Table 2. Evaluation of the external measurement model – with the mediating variable co-innovation

Items	Loads	Composite reliability	BIRD
Quality of the business relationship		0.910	0.718

TR1	0.857		
COM	0.901		
SAT	0.759		
DEP	0.867		
Process innovation		0.863	0.612
INPC1	0.793		
INPC2	0.829		
INPC3	0.723		
INPC4	0.780		
Product innovation		0.911	0.720
INPD1	0.824		
INPD2	0.876		
INPD3	0.852		
INPD4	0.841		
Items	Loads	Composite reliability	BIRD
Co-innovation		0.897	0.744
COIN1	0.893		
COIN2	0.879		
COIN3	0.814		

Note: Authors.

The results presented in Table 1 corroborate the reliability of the scales used for the exogenous and endogenous variables evaluated, since they exhibit composite reliability indicators greater than 0.7. Regarding the validity of the construct, the values of the extracted mean variance (AVE) exceed the threshold of 0.5, which denotes its acceptability for all the variables that make up the structural model. These findings allow us to infer that the external measurement model, which includes the mediating variable, is appropriate to examine the various hypotheses and the explanatory and predictive results that may be manifested in the structural model, and consequently, to evaluate the mediation effects of co-innovation.

Analysis of direct and indirect effects. The analysis of the effects makes it possible to determine the presence and type of mediation. In such a way that, if both the direct and indirect effects are significant and share the same sign, a complementary mediation is configured; on the other hand, if any of the effects presents a different sign, it is a competitive mediation. The latter scenario occurs when only the indirect effect is significant. In the event that both direct and indirect effects lack statistical significance, the hypotheses can be rejected, since the conclusion would be that the variable does not generate mediation effects. Figure 1 illustrates the results obtained using the Bootstrapping technique with 5,000 subsamples.

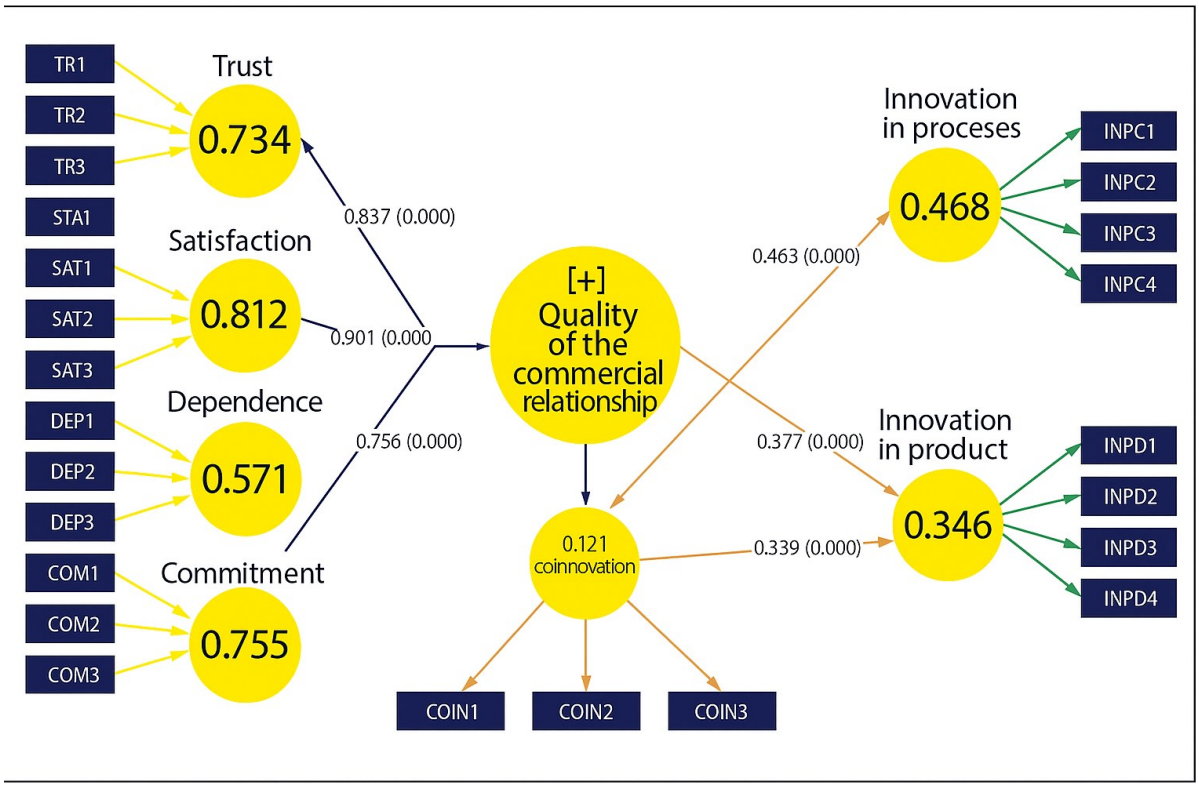

Figure 4. Direct and indirect effects and statistical significance of the structural model with the mediating variable of co-innovation

Note: Authors.

As can be seen in Figure 1, all the effects represented in the connection routes between the quality of the commercial link, co-innovation and the dependent variables innovation in processes and innovation in product, exhibit a positive direction and statistical significance. In addition, the indirect and total effects are within the limits of the established confidence interval, which allows us to preliminarily infer the existence of complementary mediation.

Table 3. The Effects of Mediation and Explained Variance (VAF)

Effect	Indicator
Quality of the commercial relationship -> Innovation in Processes	0.591***
Quality of the commercial relationship -> Product Innovation	0.495***
Quality of the commercial relationship -> Co-innovation -> Innovation in Processes	0.128***
Quality of the commercial relationship -> Co-innovation -> Product Innovation	0.118***
VAF - Process Innovation	22%
VAF - Product Innovation	24%

Note: Authors; p<0.001; **P<0.01; * p<0.05.

Based on the results of the VAF detailed in Table 2, it is inferred that both process innovation and product innovation exhibit partial mediation. This suggests that the presence of collaborative initiatives in the relationships that have reached a certain degree of quality between farmers and their suppliers leads to higher levels of innovation

in processes and products compared to those who do not develop this type of joint actions.

Comparison of the coefficients of determination R^2. Regarding the explanatory capacity of the model, which can be deduced from the coefficient of determination, Table 3 presents the results corresponding to the model without mediation and the model with mediation for the two dependent variables.

Table 4, Comparison of the coefficient of determination R2

Variable	Model without mediation		Modelled with mediation	
	R2	**R2 Adjusted**	**R2**	**R2 Adjusted**
Process innovation	0.373	0.370	0.468	0.464
Product innovation	0.247	0.240	0.346	0.340

Note: Authors.

The explanatory capacity, both for process innovation and for product innovation, undergoes a substantial increase when incorporating co-innovation as a mediating variable in the structural model. In both scenarios, the observed relationship is directly proportional; This implies that a greater perception of the quality of the commercial link with suppliers leads to an increase in collaborative innovation, which in turn generates a positive impact on the innovation of processes and products within agribusinesses dedicated to agricultural production.

Comparison of the predictive relevance Q^2. In order to determine if there are differences in the predictive capacity between the unmediated model and the mediated model, the predictive relevance of the exogenous variables on the two endogenous variables was obtained by means of the blindfolding method with a D-7 omission distance. In order to conclude that the structural model has a certain level of prediction, this indicator must yield values greater than 0. Table 4 presents the results of this comparison.

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Table 5. Comparison of Q2 predictive relevance

Variable	Model without mediation			Modelled with mediation		
	SSO	SSE	Q^2 (=1-SSE/SSO)	SSO	SSE	Q^2 (=1-SSE/SSO)
PROCESS INNOVATION	1.000.000	796.881	0.203	1.000.000	729.064	0.271
PRODUCT INNOVATION	1.000.000	829.569	0.170	1.000.000	757.874	0.242

Note: Authors.

The results show that the model that incorporates mediation exhibits a greater predictive capacity compared to the model that excludes the co-innovation variable. This allows us to affirm that the predictive level of the mediated model is acceptable and that, in some way, commercial relationships that reach quality levels between agricultural producers and their suppliers, by promoting collaborative actions, positively influence the presentation of better levels of innovation in both processes and products within agribusiness.

Discussions

The results presented in Table 1, with regard to the analysis of factor loads per item, show that all variables exhibit indicators with loads greater than 0.7, including the variable Quality of the commercial relationship, which is considered a second-order construct, developed from other variables and which requires maintaining the essence of its underlying construct (Sarstedt et al., 2019).

As a complement to the analysis, the explained variance (VAF) was determined, calculated by dividing the indirect effects by the total effects, multiplied by 100. The interpretation of the result is as follows: a VAF of less than 20% indicates absence of mediation; a value between 20% and 80% indicates partial mediation; and a VAF greater than 80% denotes complete mediation (Hair et al., 2022). Table 3 details the indirect effects, total effects and VAF corresponding to each of the dependent variables.

The findings corroborate the theory that conceives the innovative processes of an organization as phenomena of a social nature. This suggests that the incorporation of a new resource from their network of contacts generates, in some way, an interdependence that translates into mutual benefit (Rogers, 2004). This relational dynamic is described by Nordman and Tolstoy (2016) in their research on interorganizational relationships and innovation. In this sense, the scale proposed by Nordman and Tolstoy (2016) is empirically validated, and it is observed that it focuses its attention on the direct and positive connection that agricultural companies establish with their trading partners and how, from these interactions, new knowledge is developed that facilitates co-innovation.

Contributions to theory and future research. The theoretical contribution of this particular result lies in its relevance to studies on collaboration for innovation in the agricultural sector from the perspective of the supply chain; topics that, in the last decade, have evolved in the scientific community due to their link with value creation, shared knowledge and open innovation approaches, but that present limited development from the perspective addressed by this research.

The results enrich the scientific literature on innovation in the supply chain, adding to the efforts made by Abdelkafi and Pero (2018); Gao, Xu, Ruan, and Lu (2017); Lee (2019);

Munksgaard, Stentoft, and Paulraj (2014) and Yuan et al. (2019), among others. The issue of quality trade relations and their impact on technological innovation is addressed, without delving specifically into the innovative capacity that Kuhne and Gellynck and Weahver (2011) have studied. In this way, these results constitute a new body of knowledge that allows us to theorize about how commercial relationships, framed within the paradigm of relationship marketing, generate effects on technological innovation in agribusiness. This theoretical contribution on innovation in the supply chain focuses specifically on the producer-supplier perspective, contributing to the study of the dyadic relationships that are generated between these two closely linked actors in the agricultural sector. In this same sense, the contributions of this research nourish the studies that investigate the causal variables of a certain level of innovation in organizations; contemporary research using diverse contexts and types of organizations, such as studies by Dries et al. (2014); Geldes et al. (2017) and Haberli et al. (2017).

Conclusions

Collaboration for innovation emerges as the consequence of robust business links between farmers and their suppliers. By developing a shared value system, inherent in relationship marketing, business partners transcend the mere transaction, recognizing in the counterparty an opportunity to generate benefits that facilitate the achievement of objectives that, individually, would be more complex to achieve.

Among the various benefits derived from collaboration, innovation stands out, which has a direct impact on agribusinesses whose role in the technology market tends to be less proactive. Hence the relevance of co-innovation between producers and suppliers, which stands as a strategy to capitalize on commercial relations as a source of knowledge, given its accessibility in the territories. This allows agribusinesses to progress more effectively in the adoption or development of new technologies, which translates into modifications in processes or products by the agricultural producer. At the same time, the importance of fostering relationships between producers and suppliers that go beyond the purely economic, under a framework of values where trust, commitment, satisfaction and interdependence play an integrating role, enabling the combination of tangible efforts in process and product innovations in the agricultural sector is underlined.

The structural model evaluated with the mediating variable "Co-innovation" proves to have a greater explanatory power and predictive capacity compared to the structural model that omits the mediating variable, without this implying that it is an indispensable condition for the occurrence of technological innovations in agribusiness. The various results obtained allow us to validate the two working hypotheses proposed. Therefore, fostering collaborative processes with suppliers optimizes agribusiness' adoption of process and product innovations. This is particularly important for developing countries, where the less active role of agricultural producers in innovation has become evident.

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