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# EXAMINING THE BUSSINESS-UNIVERSITY RELATIONSHIP IN R&D PROJECTS IN CHILE: AN ANALYSIS OF THE ROLE OF COMMUNICATION

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**Examining the Business-University Relationship in R&D Projects in Chile:  
An Analysis of the Role of Communication**

**Synopsis:**

The present study attempts to investigate the motivations behind decision makers of Chilean companies and the relationship they have with Chilean universities, in the context of collaboration in Research and Development (R&D) projects.

The creation of university-industry (U-I) relationships can be very beneficial as it impacts research, the training of better professionals, and society in general through the reduction of the gaps between scientific and business communities (Lantos, 1994). Despite all the positives, academic research on university-business relationships is not abundant, and even the concept of this relationship has not been sufficiently discussed (Plewa & Quester, 2007). For this reason, Plewa and Quester later defined U-I relationships as "trusting, committed and interactive relationships between the university and industrial entities that enable the diffusion of creativity, ideas, skills and people with the goal of creating mutual value over time" (Plewa & Quester, 2008).

# **Examining the business-university relationship in R&D projects in Chile: An analysis of the role of communication**

## **ABSTRACT**

This article investigates the dynamics of university-industry collaboration in Chile, focusing on decision-makers within Chilean companies and their engagement with local universities in the context of Research and Development (R&D) initiatives. While the advantages of nurturing university-industry (U-I) relationships are well-recognized, limited scholarly attention has been dedicated to comprehending and characterizing these interactions.

Despite governmental efforts to foster academia-industry connections via R&D project funding, establishing lasting bonds between academia and industry in Chile remains a challenge. To address this gap, this study emphasizes university-industry communication—a pivotal aspect of collaboration. It investigates the interplay between communication, trust, commitment, satisfaction, functional conflict, and the Corporate Image of Universities, drawing upon established international models.

Utilizing an online survey and structural equation modeling with SmartPLS software, this research unveils the intricate dynamics among these variables and their influence on academia-industry collaboration in Chile. Surprisingly, certain established hypotheses do not hold in the Chilean context, shedding light on the priorities of Chilean companies and the nuances of their collaborations. These findings highlight the increasing importance of effective organizational communication and advocate for greater awareness of its positive impact. The study calls for increased research, discussion, and policymaker involvement to encourage and sustain this mutually beneficial partnership, transforming it into a virtuous collaboration.

**Keywords:** University-industry collaboration; Research and Development (R&D) projects; Structural equation modeling

## **INTRODUCTION**

It is widely acknowledged that universities and businesses play pivotal roles in a nation's development. Higher Education Institutions serve as primary producers and disseminators of knowledge, while businesses facilitate the transfer of technology to society. Presently, collaboration between academia and industry has emerged as a critical element in promoting innovation, technological advancement, economic growth, and overall societal progress (Torres Vargas et al., 2009). These two sectors possess complementary knowledge and resources that, when effectively harnessed, yield substantial results and mutual benefits (Anderson, 2001).

The interplay between academia and society holds profound significance for community development. Academic institutions, with their central role in generating and disseminating knowledge, have the potential to address real-world problems and enhance the quality of people's lives. In this context, it is essential to ensure that patents and research licensing, stemming from laboratory and classroom endeavors, are not exclusive to universities. It is heartening to witness the contemporary evolution of universities, embarking on a "second revolution," where economic and social development become

integral to their mission. The initial academic revolution established research as an academic function alongside teaching, while the emerging entrepreneurial university integrates economic development as an additional dimension (Etzkowitz, 1998).

Numerous scholars have examined the factors influencing collaboration between industry and academia (Abramo et al., 2011; Chumpitaz & Paparoidamis, 2004; Crespo & Dridi, 2007; Frassetto et al., 2012; Kohengkul et al., 2009; Martínez & Ikertia, 2007). The successful development of such collaborations faces several challenges, with one of the most significant being the obstacle of effective communication. Given the distinct languages, priorities, and expectations of both parties, knowledge transfer and collaboration can be hampered (Hennig-Thurau et al., 2001).

Notwithstanding the multitude of studies concerning university-business collaboration, a research gap remains evident (Philbin, 2008). Notably, the prevailing theoretical frameworks have yet to fully capture the actual behavior of involved entities. Furthermore, most investigations in this domain have been conducted in developed nations, with Chile remaining underrepresented. In this context, the present research endeavors to bridge this gap by providing pertinent insights for organizations to make decisions that genuinely affect their communication strategies.

In Chile, where the convergence of universities and businesses in R&D projects is relatively nascent, there exist several public policies aimed at bringing these two realms closer together. This recognition stems from the understanding that the nexus between academia and industry significantly influences a country's economic development. It enables knowledge- and technology-rich research to serve society while leaving economic residuals. However, to achieve positive outcomes, transformations are required in the communication and integration approaches of both spheres. Moreover, defining success indicators and elucidating the motivations of actors for fostering these relationships is essential. Ultimately, it is crucial to establish the benefits for companies associating with universities and vice versa (Digital, 2015).

In Chile, the Corporación de Fomento de la Producción (Corfo) stands out as the principal funding entity for academia-industry linkage activities, with the aim of enhancing the national economy. In recent years, Corfo has driven projects that facilitate closer collaboration between national universities and industry through competitive funding opportunities to generate technological valuation actions and products. For these projects to thrive, seamless communication between universities and businesses is fundamental, enabling effective collaboration in the development of diverse technologies and their subsequent commercialization for the benefit of society.

Research into science communication and the linkage between actors from different institutions in the South American country remains scarce. However, efforts such as the Presidential Commission Science for the Development of Chile (2015) emphasize the need to create an environment that fosters scientific culture and knowledge appreciation, positioning science, technology, and innovation as fundamental pillars of the country's development by 2030. Hence, it is imperative to assess the state of technological research communication in Chile and gather insights from stakeholders to enhance the communication interface between the scientific and non-scientific communities, including industry. As articulated by

Nisbet and Scheufele (2009), it is crucial to understand how each audience filters and reinterprets information before presenting it to avoid wasting resources and time on ineffective communication.

Therefore, this study seeks to characterize the context of university-industry relations, using the case of Chile as an illustrative example. Specifically, this relationship is addressed in terms of the role of communication and its interaction with key variables such as trust, satisfaction, functional conflict, commitment, collaboration, and corporate image. This exploration is conducted through an online survey, with data analysis employing the structural equations method. The ensuing results are presented and discussed considering their implications for the management of university-industry relations.

## **FACTORS THAT INFLUENCE THE COLLABORATION BETWEEN THE ACADEMY AND THE INDUSTRY**

In the realm of marketing relational principles, establishing strong and collaborative relationships between companies is crucial. However, few studies have applied these principles to higher education, with most focusing on university relationships with alumni or students (Hennig-Thurau et al., 2001; Schlesinger et al., 2021). The collaboration action between a university and industry depends on various factors (Frasquet et al., 2012). Satisfaction, trust, and communication among institutions, if understood properly, can help overcome uncertainties arising from the intangible nature of educational products (Philbin, 2008).

### **The Role of Communication in Facilitating Academia-Industry Collaborations**

Communication has long been recognized as a cornerstone in any successful organizational relationship, with its significance being increasingly noted in the context of academia-industry collaborations. Empirical studies (Jo & Shim, 2005; Skarmees, 2006; Tkalac Verčič & Men, 2023) have consistently highlighted how effective communication not only fosters understanding and transparency but also plays a pivotal role in enhancing satisfaction and trust between collaborating parties. This is particularly salient in academia-industry collaborations, where diverse objectives and cultures often coexist. Crespo & Dridi (2007), Evans & Durant (1995), and Rico et al. (2021) underscore the essentiality of maintaining robust communication channels, especially in R&D projects, to ensure the alignment of goals and expectations.

Trust emerges as a critical outcome of effective communication in academia-industry relationships. D'Este & Patel (2007) argue that when organizations and universities communicate openly, they lay a foundation for mutual understanding. This transparency reduces uncertainties and potential misunderstandings, thus fostering a trustworthy environment. Santoro & Bierly (2006) and Bstieler et al. (2015) also affirm that trust, once established through communication, paves the way for more robust and sustainable collaborations. Empirical evidence by Frasquet et al. (2012) further validates this, demonstrating that communication is a key component in relationships, positively influencing satisfaction, trust, and functional conflict resolution.

The initial stages of collaboration are particularly sensitive to the quality of communication. Plewa et al. (2013) investigated the impact of relational success factors (communication, trust, understanding, individuals) on the performance of University-Industry relationships. Their findings revealed that trust

significantly influences communication, especially in the initial collaboration phase, suggesting that establishing a strong communication framework early on is essential for the success of the partnership.

A significant aspect of communication in academia-industry relationships is its role in managing conflicts. Effective communication channels do not merely prevent conflicts; they transform them into opportunities for learning, adaptation, and innovation. Amason (1996) and Tjosvold (1998) highlight that open communication allows for constructive resolution of differences, steering conflicts towards beneficial outcomes for both parties. This perspective is supported by Morgan and Hunt (1994), who found that cooperation and communication result in greater conflict functionality due to increased trust.

Given the clear relationship between communication, trust, satisfaction, and functional conflict, the following hypotheses are proposed:

- H1: Communication between an organization and a university positively contributes to greater trust towards the university.
- H2: Communication between an organization and a university positively influences satisfaction with the relationship.
- H3: Communication between an organization and a university enhances the functionality of the conflict.

### **Commitment, Functional Conflict, and Collaboration in Academia-Industry Relationships**

In academia-industry partnerships, the interplay of commitment, functional conflict, and collaboration is pivotal. Trust in a university underpins the strength of these relationships. Organizations that trust a university typically invest more time, resources, and effort, perceiving the relationship as mutually beneficial and valuable. This trust breaks down barriers, reduces perceived risks, and encourages tackling challenges jointly, aiming for shared long-term objectives (Mayer et al., 1995; McAllister, 1995). Francioni et al. (2021) found a positive correlation between alumni trust in their alma mater and their commitment, underscoring the significance of established trust.

Satisfaction is a crucial indicator of relationship quality and plays a central role in shaping commitment levels. When involved parties in academia-industry collaborations feel satisfied, they feel validated and valued in the partnership. This satisfaction drives the desire to not only maintain but intensify the relationship, due to the mutual benefits and positive outcomes it yields (Hennig-Thurau et al., 2002; Morgan & Hunt, 1994). Chumpitaz and Papatoidamis (2004) demonstrated satisfaction's mediating role in fostering customer loyalty and commitment.

In the context of university relationships, satisfaction translates to a positive outlook on past and current interactions, crucial for establishing and consolidating trust (Palmatier et al., 2006). Correa-Henao et al. (2018) highlighted how satisfaction fosters trust, which in turn strengthens commitment in the relationship.

Given this context, the following hypotheses are proposed to further understand the dynamics of these relationships:

- H4: Trust in a university positively influences commitment to the relationship.
- H5: Satisfaction contributes positively to commitment to the relationship.
- H6: Satisfaction in the relationship positively influences trust in the university.
- H7: Satisfaction with the relationship positively affects collaboration between the organization and the university.

Moreover, functional conflict, when managed effectively, serves as a catalyst for enhancing collaboration. Constructive conflict encourages innovation and adaptability, prompting both parties to reassess and potentially refine their approaches (Barroso-Méndez et al., 2015; Tjosvold, 2008). De Dreu & Weingart (2003) noted that positively resolving conflicts can increase satisfaction with the university.

An organization's commitment to a university is vital for fruitful collaboration. Genuine commitment reflects in resource, time, and effort investment, facilitating mutual understanding and bolstering trust, thereby creating a conducive environment for innovation and knowledge exchange (Bruneel et al., 2010; Bstieler et al., 2015). Mora-Valentín et al. (2004) identified commitment as a critical factor for the success of these cooperations.

The interaction between functional conflict, satisfaction, and commitment leads to the following additional hypotheses:

- H8: Functional conflict between an organization and a university positively contributes to collaboration with the university.
- H9: Functional conflict between an organization and the university positively influences satisfaction with the university.
- H10: An organization's commitment to a university positively affects collaboration with the university.

### **The Role of Corporate Image in Academia-Industry Collaboration**

The corporate image of a university plays a vital role in building trust towards the institution. A university that maintains and projects a positive and professional image reflects its commitment, academic quality, and research excellence. This reputation and prestige serve as indicators of reliability and competence, influencing the perceptions and expectations of potential collaborators and stakeholders. A strong and well-established corporate image can reduce uncertainty and perceived risk, thereby facilitating decision-making and willingness to engage in partnerships and collaborations. In essence, a positive corporate image is an invaluable asset for universities, as it establishes a foundation of trust and credibility in both academic and professional realms (Chapleo, 2010).

A university's corporate image, as a reflection of its achievements, values, and standards, significantly influences how it is perceived and relates to external entities, including organizations. When a university displays a positive and consistent image, it suggests a level of professionalism, openness, and transparency, essential for effective communication. Organizations perceiving a university with a solid reputation are more likely to initiate, maintain, and deepen communication with the institution, anticipating quality interactions and reciprocity. In a context where perception can facilitate or hinder

collaboration, a strong and positive corporate image serves as a conducive starting point for ongoing communication and dialogue (Melewar & Akel, 2005).

Schlesinger et al. 2015) conducted a rigorous empirical analysis to test a model integrating significant variables in the contemporary university context. The model, encompassing elements like university image, student-teacher relationships, and alumni satisfaction, loyalty, and identification, offers deep insights into the dynamics of alumni-university relationships, providing valuable perspectives for strengthening these long-term bonds.

Given this context, the following hypotheses regarding the relationships between corporate image, trust, commitment, and communication are proposed:

- H11: The corporate image of the University positively contributes to greater trust towards the university.
- H12: The corporate image of the University positively influences commitment to the relationship.
- H13: The corporate image of the university positively affects communication between an organization and the university.

Figure 1 illustrates a detailed schematic representation of the interconnected relational factors highlighted by this study, with a particular focus on Communication as a central tenet. The diagram is organized around this key construct, indicating its hypothesized pivotal role in influencing various dimensions of organizational dynamics. Communication is posited as the foundational element from which other factors either emerge or are strengthened, as indicated by the direct arrows linking it to Trust, Satisfaction, and Corporate Image.

The other nodes in the diagram, while interconnected, all seem to orbit around the central theme of communication, underscoring its importance in the fabric of organizational relationships. This visual model elucidates the thirteen hypotheses proposed in the research, with communication acting as the linchpin in the proposed network of relationships. Arrows emanate from the communication node, suggesting that effective communication could lead to enhanced trust and satisfaction, which in turn could bolster the organizational commitment. The layout of the diagram emphasizes the role of communication



as not only a discrete factor but also a crucial enhancer of the overall relational framework within which the other constructs interact.

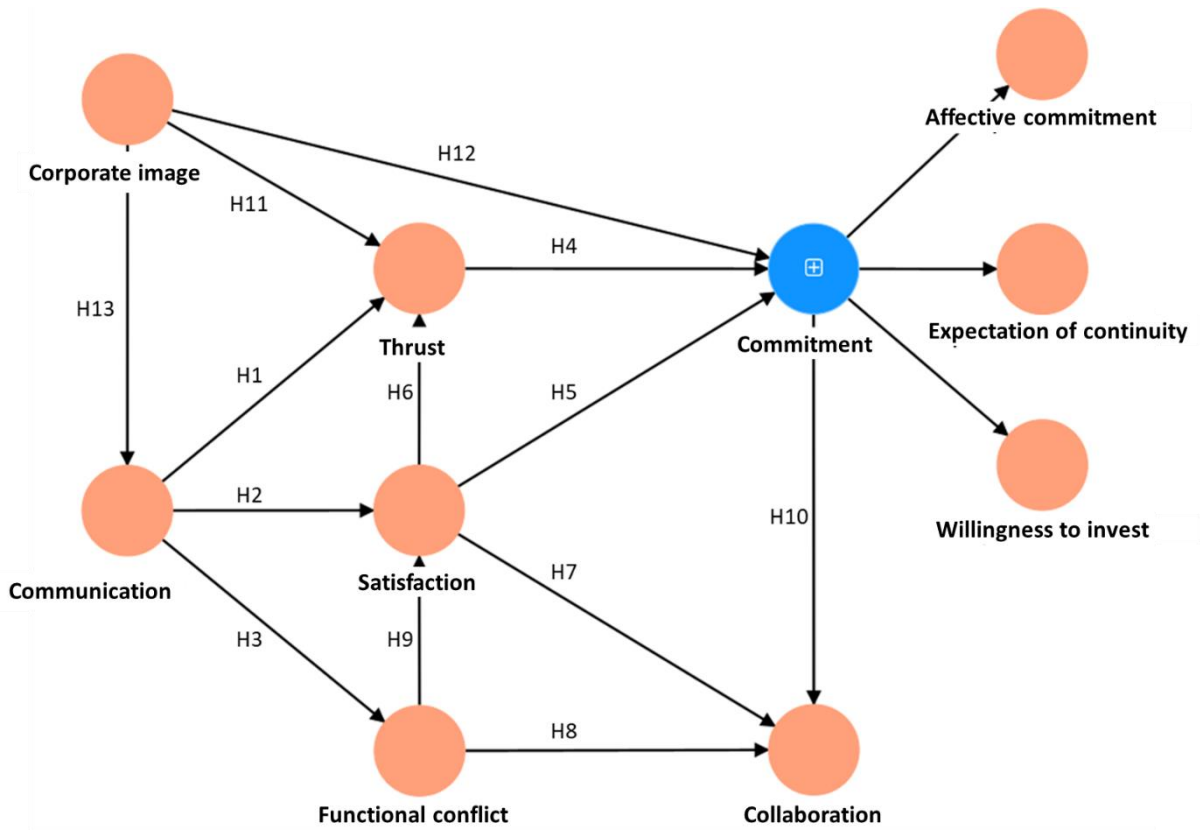


Figure 1 Proposed Model in the Current Research

## METHODOLOGY

### PROFILE AND SELECTION OF THE SURVEY COHORT

In the context of this research, the focus group consists of entrepreneurs and executives working in Chile across various industrial sectors, encompassing different company sizes and types. This includes individuals from ASIMET (Metalworking and Manufacturing Industries Association of Chile) and firms associated with CORFO (Production Development Corporation). They are expected to have engaged in academia-linked projects, typically known as R&D projects aimed at the significant creation or enhancement of a productive process, product, or service, which may include industrial research, experimental development, and new technologies.

The methodology for characterizing users was established and subsequently put to the test with a group of 20 individuals to ensure the questions were accurately honed. This report, having been finalized, has been distributed to those respondents who expressed a desire to receive it. Detailed survey data, documenting the participation of entrepreneurs and CEOs from a variety of Chilean companies, has been compiled in a technical sheet. The data was collected through a comprehensive national survey conducted in Chile via email, LinkedIn, and WhatsApp. The survey successfully garnered responses from over 1000

individuals, yielding 76 effective surveys, with the collection process completed within the timeframe of April 24, 2023, to June 9, 2024.

## **VARIABLES AND INSTRUMENT**

To validate the hypotheses, a set of indicators will be measured via a survey. These indicators are adapted from the literature to fit our study's context and are measured on 5-point Likert scales (1-5). Table 2 displays the indicators used along with their bibliographic sources.

Communication (Palmatier et al., 2007). Amount, frequency, and quality of information shared between exchange partners.

- COM1: Communications with the university are prompt and timely.
- COM2: Communications with the university are well defined.
- COM3: Communications with the university are accurate.
- COM4: Communication channels with the university are well known.

Trust (Plewa & Quester, 2008). Trust in a partner's reliability and integrity.

- TRU1. We feel we can trust this university.
- TRU2. This university is expected to act with integrity.
- TRU3. We feel this university has been on our side.

Satisfaction (Plewa & Quester, 2008). The customer's affective or emotional state towards a relationship typically assessed cumulatively over the history of the exchange.

- SAT1. The university has met its relationship responsibilities and commitments so far, meeting expectations.
- SAT2. Our relationship with the university has been productive.
- SAT3. The time and effort we have put into the relationship with the university have been worthwhile.

Functional Conflict (Skarmeas, 2006). Refers to a type of conflict that, instead of being detrimental to a relationship, generates a positive effect because it allows mutual growth and understanding.

- FC1. Our discussions on areas of disagreement stimulate us to find productive ideas for our problems.
- FC2. Our discussions on areas of disagreement increase the strength and effectiveness of our relationship.

Commitment - Affective Commitment (Kumar et al., 1995). A positive bond that leads an entity to feel committed and dedicated to a relationship.

- AC1. Even if we could, we would not leave the university because we enjoy being associated with it.

- AC2. We want to continue being part of the university network because we genuinely enjoy our relationship with it.
- AC3. Our positive feelings towards the university are one of the main reasons we continue working with it.

Commitment - Expectation of Continuity (Kumar et al., 1995). Refers to the assumption that a company or entity will continue operating in the near future.

- EC1. We expect our relationship with the university to last a long time.
- EC2. Renewing our relationship with the university is virtually automatic.
- EC3. It is unlikely that our company will continue doing business with this university in 2 years.

Commitment - Willingness to Invest (Kumar et al., 1995). The willingness or ability of an entity to allocate resources and to take certain risks hoping for a future positive return.

- WI1. If the university asked, we would be willing to make more investments to support the collaboration.
- WI2. We are willing to put more effort and investment into building the relationship with the university.
- WI3. In the future, we will work to link our firm with the university in the minds of our customers.

Corporate Reputation (Schlesinger et al., 2021). The general perception and valuation that different stakeholder groups have of a company or organization.

- CI1. I have always had a good impression of this university.
- CI2. In my opinion, this university has a good image in the minds of consumers.
- CI3. I believe that the university has a better image than its competitors do.
- CI4. Overall, I have a positive image of this University.

Collaboration (Frasquet et al., 2012). Coordinated and complementary actions between exchange partners to achieve mutual goals.

- COLLABORATE1. Collaboration on the research and development project.

## **PROCEDURE AND DATA ANALYSIS**

The methodology for applying and validating the structural equation model is based on that proposed by Ramírez et al. (2014), which consists of three phases: 1) Model Description, 2) Validation and Reliability of the Measurement Model, and 3) Assessment of the Structural Model.

### **Phase 1: Model Description**

The first phase of the study focuses on describing the structural model, defining the relationships between variables, and establishing connections between constructs and their corresponding indicators, known as

the initial measurement model. However, this model description is flexible and may be subject to change based on results obtained in phases 2 and 3.

### **Phase 2: Validation and Reliability of the Measurement Model**

This phase verifies the validity and reliability of the proposed measurement model. First, the reliability of indicators in relation to their constructs is assessed through factor loadings, where high values indicate that an indicator is a good representative of the construct and significantly contributes to its measurement, with a minimum acceptable loading value of 0.55 (R. Frank & Miller, 1992). To assess construct reliability, Cronbach's alpha coefficient (CA) and the construct's composite reliability (CR) are used as measures of internal consistency, where a CA close to 1 indicates high reliability and internal consistency. The CR is used to assess consistency, where a value close to 1 indicates high internal consistency and reliability of the indicators (with a CA and CR of 0.7 or higher considered acceptable) (Henseler et al., 2009).

To assess internal consistencies of the model, the Average Variance Extracted (AVE) is considered, used to determine the amount of variance explained by a construct's indicators relative to its total variance. Fornell and Larcker (1981) suggest a minimum acceptable value of 0.5 for AVE, indicating that over 50% of the construct's variance is explained by its indicators, ensuring significant fit and high correlation among them.

The R-squared indicator is a measure of model fit, where a value between 0.25 and 0.5 indicates a weak effect, between 0.5 and 0.75 a moderate effect, and above 0.75 a strong effect. The F2 effect size helps identify which constructs in the model have a stronger or weaker influence over others, allowing prioritization or focus on certain relationships within the model. The interpretation of the effect size value is that an  $F2 < 0.02$  indicates an insignificant effect, between 0.02 and 0.15 a small effect, between 0.15 and 0.35 a medium effect, and greater than 0.35 a large effect.

### **Phase 3: Assessment of the Structural Model**

Subsequently, the hypotheses are tested by examining the path coefficients and Bootstrapping analysis. Path coefficients determine if there is a significant relationship between two variables in the model and the direction of that relationship (positive or negative). Values greater than 0.2 are considered significant, although ideally, they should be greater than 0.3. Bootstrapping analysis evaluates the statistical significance of the relationships between the model's variables, i.e., whether the observed associations are significantly different from zero.

## **RESULTS**

After processing survey responses and discarding incomplete ones, 76 valid responses were obtained. Using Hair et al.'s (2021) inverse square root method, which considers significance level and minimum path coefficient but not model complexity, a minimum sample of 69 is required for a 5% significance level and a path coefficient of 0.21 to 0.3. Therefore, the obtained sample of 76 responses is adequate.

To examine the study's hypotheses, the structural model was analyzed using SmartPLS software. It is important to note that the 'commitment' variable was modeled as a second-order variable. Figure 2 presents the results from fitting this model to the survey data. In the next sections, the analysis and adjustment of the scales are discussed.

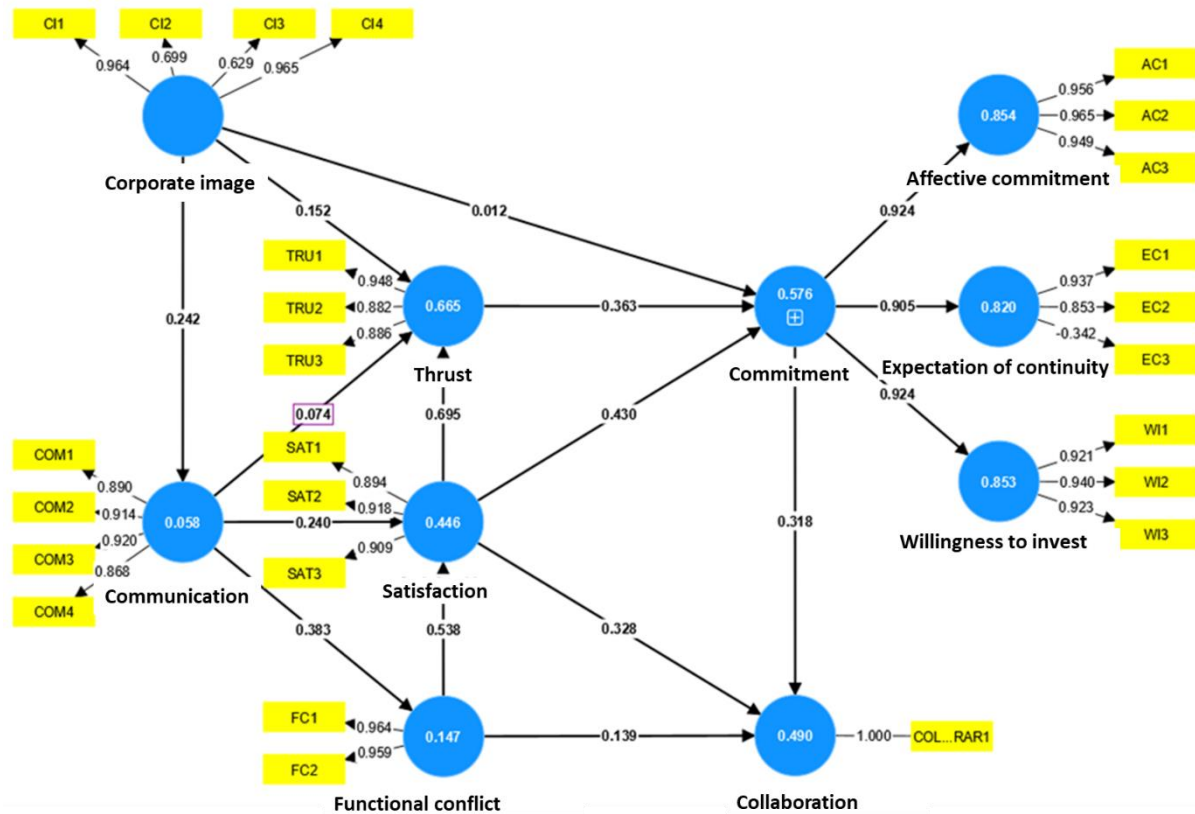


Figure 2 Structural Model Developed in SmartPLS Software. The R-squared values are indicated within the circles, path coefficients on the lines between variables, and external loadings on the lines to the indicators.

### Analysis and Adjustment of the Scales

Upon analyzing the external loadings in Table 1, it is observed that all used constructs have factor loadings above 0.6, except for item EC3, related to Continuity Expectation, specifically "it's unlikely that our company will continue doing business with this university in 2 years." This item has a lower, negative external loading, indicating that EC3 does not significantly contribute to the Commitment variable. Therefore, it will be excluded from the model.

Indicator	Loads	Indicator	Loads
AC1 <- Affective commitment	0.956	EC3 <- Expectation of continuity	-0.351
AC2 <- Affective commitment	0.965	FC1 <- Functional conflict	0.961
AC3 <- Affective commitment	0.950	FC2 <- Functional conflict	0.952
CI1 <- Corporate image	0.964	SAT1 <- Satisfaction	0.897
CI2 <- Corporate image	0.705	SAT2 <- Satisfaction	0.920
CI3 <- Corporate image	0.636	SAT3 <- Satisfaction	0.911
CI4 <- Corporate image	0.967	TRU1 <- Trust	0.941

COM1 <- Communication	0.891	TRU2 <- Trust	0.882
COM2 <- Communication	0.913	TRU3 <- Trust	0.875
COM3 <- Communication	0.918	WI1 <- Willingness to invest	0.917
COM4 <- Communication	0.870	WI2 <- Willingness to invest	0.940
EC1 <- Expectation of continuity	0.937	WI3 <- Willingness to invest	0.921
EC2 <- Expectation of continuity	0.856	COLLABORATE1 <- Collaboration	1,000

**Table 1 Analysis of external loads**

Regarding the model's reliability and the variables used, Table 2 displays metrics validating the construct's reliability and validity. All Cronbach's alphas exceed 0.69. Additionally, the values for composite validity, a measure of internal consistency in scale elements, are also above 0.6. In terms of validity, including unidimensionality of constructs, it is noted that the average extracted variance is above 0.5 in all cases, meaning that the construct shares more than half of its variance with its indicators.

	Cronbach's alpha	composite reliability (rho_a)	composite reliability (rho_c)	Average Variance Extracted (AVE)
Commitment	0.900	0.950	0.934	0.660
Communication	0.920	0.924	0.944	0.807
Trust	0.882	0.894	0.927	0.810
Functional conflict	0.907	0.914	0.956	0.915
Corporate image	0.871	1,045	0.897	0.691
Satisfaction	0.895	0.896	0.935	0.827

**Table 2 Reliability and validity of the model**

Both Composite Reliability (CR) and Cronbach's Alpha (CA) exceed 0.7 in all cases, indicating high reliability and internal consistency, meaning the indicators are highly correlated and reliably measure the variables. The Average Variance Extracted (AVE) also meets the requirement of being above 0.5, specifically indicating that over 66% of the variance of the variables is explained by their indicators.

Analyzing the F2 effect size (see Table 3), we observe that the relationships between communication and trust, as well as between corporate image and commitment, have an insignificant effect on the model. This suggests that while these relationships may exist, they do not have a notable impact in our study's context. On the other hand, relationships showing a more pronounced effect are those between satisfaction and trust, and between communication and satisfaction.

	F <sup>2</sup>
Commitment -> Collaboration	0.094
Communication -> Trust	0.016
Communication -> Functional conflict	0.188
Communication -> Satisfaction	0.093
Trust -> Commitment	0.108
Functional conflict -> Collaboration	0.022
Functional conflict -> Satisfaction	0.426
Corporate image -> Commitment	0.000
Corporate image -> Communication	0.069
Corporate image -> Trust	0.050

Satisfaction -> Collaboration	0.086
Satisfaction -> Commitment	0.154
Satisfaction -> Trust	0.882

**Table 3 Size effect F<sup>2</sup>**

## Model Fit

In Table 4, the path coefficients and p-values obtained through bootstrapping analysis are presented. According to this analysis, relationships with a path coefficient lower than 0.21 are not validated and should be re-evaluated (marked in red in the table).

	Path coefficients	p-values
Commitment -> Collaboration	0.315	0.033
Communication -> Trust	0.090	0.385
Communication -> Functional conflict	0.406	0.000
Communication -> Satisfaction	0.251	0.011
Trust -> Commitment	0.363	0.032
Functional conflict -> Collaboration	0.134	0.389
Corporate image -> Commitment	0.033	0.913
Corporate image -> Trust	0.170	0.153
Satisfaction -> Collaboration	0.333	0.045
Satisfaction -> Commitment	0.423	0.005
Satisfaction -> Trust	0.661	0.000

**Table 4 Path coefficients and p-values**

## HYPOTHESIS ANALYSIS

The results indicate that, in the case of Chile, the first hypothesis (H1) is not supported. That is, there is not a direct correlation between communication and trust. While organizational communication does promote relationships, satisfaction, and functional conflict, it does not necessarily result in greater trust. This could be explained by the fact that companies in Chile are more focused on meeting short-term metrics and objectives than Chilean universities. Therefore, achieving set goals and objectives, which could imply greater trust, is more critical for them, and while it may be accompanied by good communication, it is not solely due to it.

Furthermore, hypothesis H8 is also not supported in Chile. That is, functional conflict does not directly aid collaboration. Echoing the rationale behind H1, even though companies recognize the importance of having spaces for discussion and clarifying areas of disagreement, their own metrics are again more significant.

Lastly, regarding Corporate Image, our hypotheses, based on existing literature, sought to prove that the corporate image of a university positively affects greater trust (H11), commitment (H12), and communication (H13) towards the university. However, according to the developed structural model, hypotheses H11 and H12 are not supported in the Chilean context. In other words, there is no direct

correlation in Chile between the corporate image of a Higher Education Institution and trust or commitment in an R&D collaboration.

In Figure 3, the final model with validated hypotheses is presented, displaying the relationships and interactions among the variables that were confirmed through the research. This diagram serves as a visual representation of the significant findings and the established connections within the study's framework.

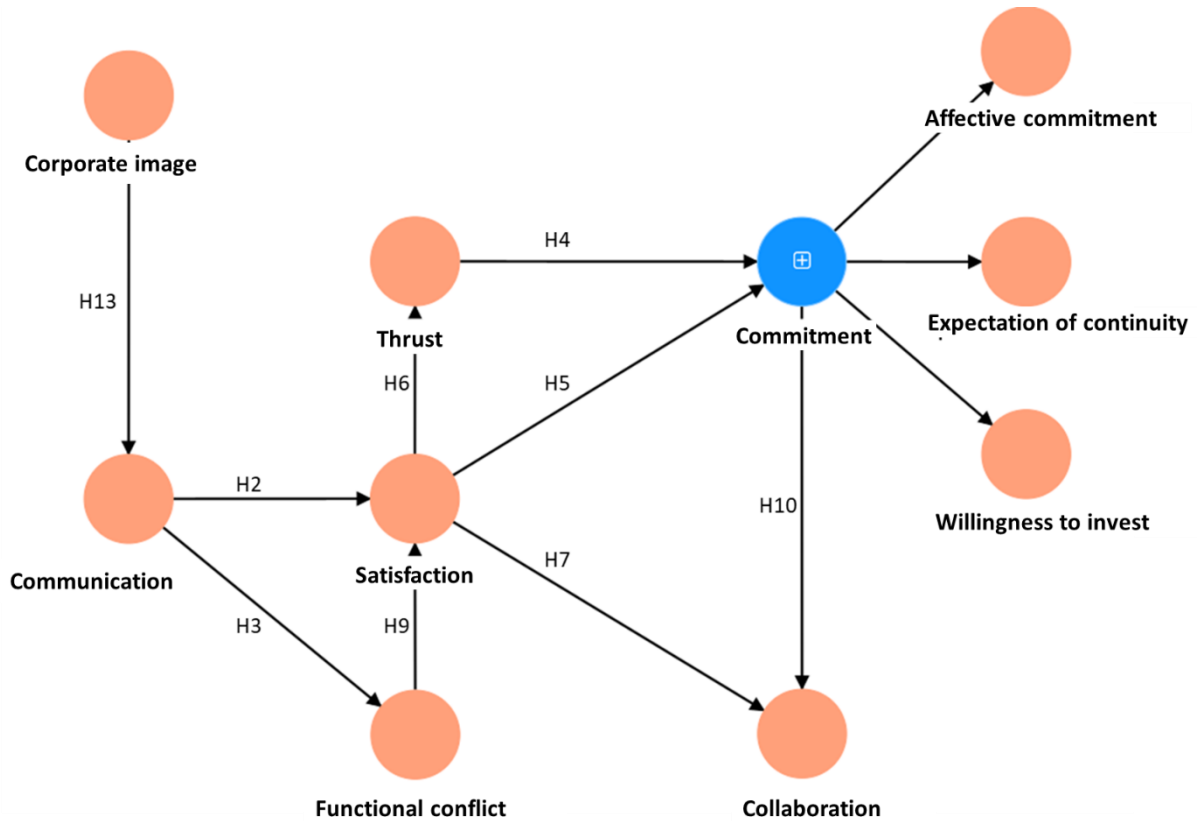


Figure 3 Model with validated hypotheses

## CONCLUSIONS

This thesis aimed to identify key factors influencing collaboration projects between academia and industry in Chile, such as communication, trust, satisfaction, functional conflict, commitment, and corporate image, and to analyze their interrelations. The objectives were to formulate hypotheses linking these factors, develop an effective research tool for data collection, and implement an analytical model to understand the observed and unobserved variable relationships in academia-industry collaboration.

The study successfully achieved its objectives, analyzing and assessing the results to identify the interactions between variables and their impact on academia-industry collaboration. It highlighted the importance of communication in relationships between universities and businesses.

To validate the hypotheses, indicators were measured through a survey applied to Chilean companies that have collaborated with higher education institutions in R&D projects. The survey indicators, based on existing literature with minor adaptations for our study's context, were measured using 5-point Likert



scales. The results were analyzed, and hypotheses validated using a structural equation model in SmartPLS, identifying the interactions' nature and magnitude and their impact on academia-industry collaboration.

The survey results showed a preference for collaboration with traditional universities, both public and private, particularly the University of Chile. This preference may be due to its recognition and prestige. However, the survey distribution mainly through networks associated with the University of Chile might have biased the respondents. A broader survey encompassing other universities and research centers would provide a more balanced and representative picture of academic and research collaboration in Chile.

The respondents, predominantly male, with an average age around 46 years, ranged from 27 to 73 years. Most held executive or managerial positions and had postgraduate education. This demographic suggests a predominance of experienced professionals in their fields.

The survey participants were mainly from industries in the Metropolitan Region, including Agriculture, Forestry, Energy, Manufacturing, Mining, and Aquaculture. These sectors, key to Chile's GDP, are expected to have a greater intent for innovation and development.

This research builds on a model based on eleven hypotheses related to Communication, Trust, Satisfaction, Functional Conflict, Commitment, and Corporate Image. However, for Chile, certain hypotheses validated by Frassetto et al. (2012) were not supported, such as the direct correlation between communication and trust. While organizational communication promotes relationships, satisfaction, and functional conflict, it does not necessarily lead to greater trust, possibly due to companies' focus in short-term metrics and objectives.

The Frassetto et al. (2012) model also proposed a positive relationship between functional conflict and collaboration with universities, but this was not supported in Chile. Functional conflict does not directly aid collaboration, as companies prioritize their own metrics over collaborative discussions.

Concerning Corporate Image, our hypotheses aimed to prove that a university's corporate image positively affects trust in the university. However, the structural model developed in SmartPLS did not support this in the Chilean context, indicating no direct correlation between a Higher Education Institution's corporate image and trust or commitment in an R&D collaboration.

Our findings underscore the increasing relevance of organizational communication, with organizations becoming more aware of its positive impact. This highlights the need for academia to create research and socialization spaces on this topic and for industry to build long-term bridges with universities. Government incentives could further enhance this virtuous collaboration.

The results of this study led to a new model based on nine validated hypotheses related to Corporate Image, Communication, Trust, Satisfaction, Functional Conflict, Commitment, and Collaboration. The model determines that these hypotheses are related to the industry-academia linkage.

Corporate image is important and relates to communication, which directly affects satisfaction and functional conflict. Satisfaction is linked to collaboration, commitment, and trust, with the latter tied to commitment and collaboration.

With this understanding of each hypothesis's impact and the validated indicators from the survey, strategic plans should be developed to improve existing links between businesses and Chilean academia.

Questions arising from this analysis include: What are the attitudes of Chilean academics and businesspeople towards a more dialogic model of dissemination? How do their perceptions of their audience influence their communication practices towards the community? How can these communicative practices be improved?

In a competitive and complex business environment, effective communication is crucial for a company's success and can enable higher education institutions to have a greater societal impact and secure new funding sources. Efficient, strategic communication helps build solid, long-lasting relationships with various audiences, creating business opportunities and beneficial collaborations.

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