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PROTECTION OF INTANGIBLE ASSETS ABROAD: A MULTIPLE CASE STUDY OF TECHNOLOGY-BASED BRAZILIAN FIRMS

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Abstract

In internationalization contexts, intangible assets constitute the foundation of firms' competitive advantage; however, their cross-border exploitation exposes firms to risks that may erode the value of such assets and generate significant negative impacts on organizational performance. In response to this problem, this study aims to analyze how firms protect their intangible assets during their internationalization process, identifying the mechanisms adopted and the underlying explanatory factors. Methodologically, the research adopts an explanatory qualitative approach and follows a theoretical–deductive method, operationalized through a bibliographic review combined with a multiple case study design. Primary data were collected through in-depth semi-structured interviews with top-tier decision-makers from two Brazilian technology-based firms intensive in intangible assets and operating internationally, complemented by secondary data (e.g. internal documents, public sources and institutional materials) derived from extensive and diverse desk research. Data analysis followed an analytical–deductive logic, grounded in theoretical propositions and systematic within- and cross-case comparison procedures, supported by theoretical–methodological and source-based triangulation. The findings indicate that the protection of intangible assets does not stem from isolated mechanisms but rather from specific dynamic configurations involving the nature of the assets, organizational specificities and firms' internationalization trajectories, which generate distinct risk and threat configurations and, consequently, lead to the adoption of different intangible asset protection strategies.

Keywords: Emerging Market; Intangible Assets; International Business; Protection Mechanisms; Risks and Threats; Technology-Based Firms.

Resumo

Em contextos de internacionalização, ativos intangíveis constituem a base da vantagem competitiva das firmas, mas sua exploração além-fronteiras as expõe a riscos que podem erodir o valor de tais ativos e gerar impactos negativos significativos às empresas. Diante desse problema, este estudo tem como objetivo analisar como empresas protegem seus ativos intangíveis durante o processo de internacionalização, identificando os mecanismos adotados e os fatores explicativos subjacentes. Metodologicamente, a pesquisa possui uma natureza qualitativa explicativa e adota um método teórico-dedutivo, operacionalizado por meio de uma pesquisa bibliográfica associada a um estudo de casos múltiplos. O levantamento de dados primários envolveu entrevistas semiestruturadas em profundidade com executivos-chave de duas firmas brasileiras intensivas em ativos intangíveis, atuantes internacionalmente, complementadas por dados secundários (e.g. documentos internos, fontes públicas, materiais institucionais) oriundos de uma ampla e diversa pesquisa de gabinete. A análise de tais dados seguiu uma lógica analítico-dedutiva, apoiada em proposições teóricas e em procedimentos sistemáticos de comparação intra e entre casos, com triangulação teórico-metodológica e baseada em fontes diversas. Como resultado, foi identificado que a proteção de ativos intangíveis não decorre de mecanismos isolados, mas de configurações dinâmicas específicas entre a natureza dos ativos, as particularidades organizacionais e as trajetórias de internacionalização das firmas, gerando diferentes configurações de riscos e ameaças e na consequente adoção de estratégias de proteção de ativos intangíveis distintas.

Palavras-chave: Ativos Intangíveis; Firmas Baseadas em Tecnologia; Mecanismos de Proteção; Mercado Emergente; Negócios Internacionais; Riscos e Ameaças.

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INTRODUCTION

In markets characterised by accelerated cycles of innovation, efficiency pressures, and increasing process digitalisation, the ability to create and, above all, retain value across borders has become as strategic as the pursuit of new opportunities abroad. In technology-intensive sectors, assets such as technical knowledge, managerial expertise, data, brand, organisational culture, and relational networks not only underpin value capture but also shape the ways in which firms structure their international strategies. This strategic role of intangible assets within organisations aligns with both seminal and contemporary international business literature, reinforcing their importance to the field over time.

However, while such assets enable firms to enter and differentiate themselves in global markets, they also become particularly vulnerable to risks arising from unequal institutional environments, distinct cultural practices, and asymmetries in protection and governance, revealing a critical issue from an internationalisation perspective. These threats not only compromise the integrity of the core resources that sustain a firm's competitiveness but also directly affect its ability to generate value, maintain reputation, ensure differentiation, secure economic outcomes, and support international expansion strategies. For technology-based firms, whose competitive advantage relies heavily on intangible assets, the inability to protect these resources abroad may lead to client loss, margin erosion, unauthorised replication of solutions, and the deterioration of both local and international positioning, making the protection of intangibles a strategic imperative rather than merely a complementary practice.

Despite the growing centrality of intangible assets in contemporary competitive dynamics, understanding how organisations combine practices to protect such assets in the context of internationalisation remains limited. The literature acknowledges the importance of these resources for global competitiveness, yet little is known about the mechanisms firms actually mobilise to prevent losses, mitigate specific risks, and preserve advantages built over time. This gap is even more pronounced in the case of firms from emerging economies, whose international trajectories tend to be shaped by domestic institutional constraints and a more restricted availability of formal safeguards. Therefore, it is necessary to understand how companies deal with risks to their assets and businesses that arise when they expand beyond the borders of their home countries.

Given this scenario, this study primarily sought to answer the research question "How do technology-based Brazilian firms operating abroad protect their intangible assets in the international market?". By investigating this phenomenon, the aim is to understand the different protection arrangements adopted by firms to address vulnerabilities affecting their intangible assets and business operations. The objective is to analyse, in an integrated manner, firm-specific characteristics, the nature

of their assets, and their internationalisation trajectories, identifying patterns, contrasts, and mechanisms that explain why companies with similar levels of dependence on intangible assets adopt substantially different protection strategies. Furthermore, this study is expected not only to advance academic understanding of the topic but also to generate practical managerial implications by informing the debate on mechanisms and practices for protecting intangible assets within the context of internationalisation.

To advance this purpose, the study adopts a conceptual framework grounded in the idea that the protection of intangible assets does not stem from isolated factors but from the combination of three explanatory elements: (i) the nature of the intangible assets; (ii) organisational specificities; and (iii) the internationalisation trajectories pursued by firms. This configurational perspective enables the simultaneous analysis of internal and external elements that potentially shape firms' opportunities, risks, and response capabilities, offering a more comprehensive lens through which to interpret how protection mechanisms are structured throughout the international expansion process.

From a methodological perspective, this explanatory research used a theoretical-deductive method through the combination of organizational and internationalisation bibliographic research (with the objective of guiding the theoretical and analytical foundation of the study) and multiple case study approach with two technology-based Brazilian firms to theoretically and empirically advance the international business literature around the identified gap. This approach makes it possible to examine the phenomenon in depth, considering the real context in which it occurs, the organisational dynamics involved, the institutional arrangements of each market, and the multiplicity of evidence sources available. The methodological design was guided by an established research protocol to enhance the study's rigour, validity, and reliability, triangulating semi-structured interviews with decision makers of the firms (primary data), public and internal documents, archival records, and other secondary sources gathered through desk research. By structuring the investigation in this way, the study seeks to contribute to a more refined understanding of the protection of intangible assets in the context of internationalisation, offering both theoretical insights for the literature and practical implications for managers operating in environments where the preservation of intangible assets is vital to sustaining competitive advantage.

In addition to this introduction, which addresses the research planning agenda and the motivations of the study, the article is divided into the following sections: theoretical background, which provides the basis for this study and establishes its connection with the existing knowledge in the field; research methodology, where a detailed research protocol is presented; analysis and discussion, with details of the studied context, its analysis and the generation of insights in light of the research question; and the conclusion, which summarizes the main results of the study, its limitations, and suggests potential paths for future research.

THEORETICAL BACKGROUND

Several scientific studies and controversial debates in the literature have not arrived in an universal definition for intangible assets (LUCA *et al.*, 2014; NICHITA, 2019; AZAMAT *et al.*, 2023), and it remains a topic under extensive exploration in recent social science literature through researches that reinforces its importance for the study of organizations in their different nuances (SATO; PANIBRATOV, 2023; KETER; CHEBOI; KOSGEI, 2024; STAN; ȚÎȚU; PARASCHIV, 2024). In the contemporary IB literature (field of interest for this research), these assets - ranging from formal intellectual property (e.g. patents, trademarks, copyrights) to tacit resources (e.g. organisational culture, knowledge, reputation, networks) - are recognised not only as components of the firm, but as the core of Firm-Specific Advantages - FSAs (SATO; PANIBRATOV, 2023). Unlike physical assets, intangibles are characterised by non-rivalry and strong scalability (ANAND; DELIOS, 1997), enabling their simultaneous deployment across multiple geographies without loss of utility, thereby positioning them as the primary engine of modern international expansion (KAFOUROS *et al.*, 2022).

From the perspective of internationalisation theories, the concept of internalisation suggests that firms tend to safeguard such assets internally through foreign direct investment (FDI) in order to prevent their dissipation or misappropriation in market transactions (BUCKLEY; CASSON, 1976). Dunning's (1977, 2001) Eclectic Paradigm, in turn, emphasises the role of proprietary intangible assets in shaping firm-specific advantages (i.e. the ownership dimension), which confer important competitive differentials in foreign markets. Behavioural and network-based theories complement this understanding. The Uppsala Model (JOHANSON; VAHLNE, 1977) underscores the incremental accumulation of experience about foreign markets, which in turn implies the need to manage and safeguard the knowledge acquired throughout the process. Similarly, network approaches (JOHANSON; MATTSSON, 1988) and the theories of International New Ventures and Born Globals (OVIATT; MCDOUGALL, 1994; KNIGHT; CAVUSGIL, 1996) highlight that knowledge-based resources and networks are determinants from the very beginning of international operations. In sum, internationalisation theories indicate that firms' global success depends on their ability to exploit and protect the intangible assets that sustain their competitive advantage throughout their internationalisation journey. This highlights the strategic value of these types of assets for firms operating internationally, a fact that is also emphasized by central theories of internationalisation (Chart 1).

Additionally, from the perspective of some of the main organizational and strategic theories, the exploitation of strategic intangible assets – such as core competencies, unique resources, and proprietary knowledge – guarantees the competitive advantage of firms in the market. Resource-Based View (RBV)

theory (BARNEY, 1991) has been extensively integrated into IB research to explain the sustainability of global competitive advantage. For this author, intangible assets are sources of sustainable competitive advantage precisely due to their social complexity and causal ambiguity, which generate strong barriers to imitation and protect such assets.

Chart 1 - Main internationalisation theories lenses over intangible assets

	Eclectic Paradigm (OLI)	Uppsala Model	International New Ventures (INV)	Born Globals
Seminal works	Dunning (1977, 2001)	Johanson; Vahlne (1977)	Oviatt; McDougall (1994)	Rennie (1993), Knight; Cavusgil (1996)
Focus of theory	Advantages: ownership, location, internalization	Experiential learning and gradual commitment	Rapid internationalisation since its inception	Speed and global reach from the start
Competitive advantage	Strategic combination of OLI advantages	Market knowledge and networking skills	Unique entrepreneurial capabilities	Agility, innovation and resilience
Importance of intangible assets	Central: specific ownership advantages	Essential: market knowledge and networks	Fundamental: knowledge and skills	Critic: innovation and global orientation
Role of intangible assets	Basis of ownership advantages	Psychic distance and uncertainty reduction	Firm's lack of experience compensation	Accelerated internationalisation enablement

Source: Self elaboration.

However, in the international context, the "transferability" of intangible resources becomes a paradox: for firms to capture value from these assets abroad, knowledge must be easily transferable, yet this very mobility renders it vulnerable to spillovers and imitation by foreign competitors (KOGUT; ZANDER, 1993). This paradox thus reveals a trade-off between the speed of internal diffusion of intangible assets (in this case, knowledge) and protection against vulnerabilities such as external appropriation. The Knowledge-Based View (KBV) (GRANT, 1996) deepens this logic by treating knowledge (an intangible asset) as a strategic resource essential to the internationalisation journey. From a KBV perspective, the ability to integrate organisational knowledge globally and to learn in international contexts is a determinant of the firm's performance abroad. Therefore, effectively protecting knowledge flows, both tacit and explicit, becomes indispensable for maintaining the advantage derived from these intangible resources. In sum, resource-based approaches emphasise that, as immaterial capital constitutes the essence of competitive advantage, its use in internationalisation requires protection mechanisms that ensure the firm's full appropriation of its value. Chart 2 highlights central organizational theories and their perspectives on the importance of intangible assets.

The unique resources exploited by multinational firms in their internationalisation journeys are crucial and widely studied by researchers in the international business field. Rugman and Verbeke (2001) and Adarkwah and Malonæs (2022) reinforce this statement in their reviews by highlighting that different seminal works over decades explained the importance of firm-specific assets (FSAs) - unique proprietary resources and capabilities that provide competitive advantage to a firm (MAGELSSEN, 2015) - in the success of MNEs. Similarly, several authors reinforce in recent studies the importance of intangible assets

(as FSAs) as central elements of value generation for firms in the context of international business (AMANKWAH-AMOAH; BOSO; KUTSOATI, 2022; BUCKLEY *et al.*, 2022; KAFOUROS et al., 2022; OH; OETZEL, 2022).

Chart 2 - Main organizational theories lenses over intangible assets

	Core Competence View	RBV and KBV	Organizational Capability View	Relational View
Seminal works	Prahalad and Hamel (1990)	Barney (1991; 2001), Grant (1996)	Kogut and Zander (1992; 1996)	Dyer and Singh (1998)
Focus of theory	Collective learning and skills coordination	Strategic resources and firm knowledge	Combinative capabilities and knowledge	Interorganizational relationships and networks
Competitive advantage	Core competences and unique resources that are difficult to imitate	VRIN resources generate sustained competitive advantage	Creative combination of knowledge	Relational income through cooperation and relationship-specific assets
Importance of intangible assets	Fundamental: knowledge, skills and abilities	Central: the basis of competitive advantage	Essential: tacit and explicit knowledge	Critic: trust and social capital
Role of intangible assets	Differentiation of the firm from competitors	Source of strategic heterogeneity	Storage, transfer and creation mechanism	Enablers of strategic relationships

Source: Self elaboration.

Intangible assets, as unique resources for firms, have characteristics that differentiate them from other types of FSAs, such as their distinctiveness, intangibility, confinement and transferability across industries, segments and borders (ANAND; DELIOS, 1997; CONTRACTOR; YANG; GAUR, 2016), favouring its use in cross-border movements and making them central pieces in international strategies/operations. On the other hand, both classical and contemporary IB scholars reports that this easy dissemination of intangible assets also gives firms a high risk of misappropriation of formal assets (DUNNING, 2001; RUGMAN; VERBEKE, 2001; NGUYEN, 2020; AMANKWAH-AMOAH; BOSO; KUTSOATI, 2022); erosion, dispersion and replication difficulties (GRANT, 1996; CUI *et al.*, 2022); and dissemination, imitation and the development of substitutes (OVIATT; MCDOUGALL, 1994; SINANI *et al.*, 2024). This scenario illustrates the multifaceted nature of the roots of risks and threats to firms' intangible assets in international contexts, which in turn results in a plurality of protection approaches adopted by firms.

The discussion on asset protection connects directly to Teece's (1986) classical concept of appropriability regimes. The author argues that in international environments, where the effectiveness of intellectual property regimes varies significantly across host countries, firms cannot rely exclusively on legal mechanisms (e.g., patents, trade secrets, copyrights). This viewpoint aligns with Rumelt's (1984) notion of "isolation mechanisms", which posits that organisations must develop an architecture combining legal, strategic and operational protections for their resources. In sum, authors have identified a range of

approaches for protecting intangible assets in international contexts, combining formal, organisational, relational and institutional mechanisms.

In the formal domain, protection is strengthened through instruments such as patents, trademarks and copyrights across multiple jurisdictions, aiming to limit the misappropriation of proprietary knowledge (KUKHARSKYY, 2020; BUCKLEY *et al.*, 2022; HUDSON; MORGAN, 2025). These instruments are often complemented by contracts containing clauses specifically designed to safeguard such assets, including exclusivity provisions (GHAMARI *et al.*, 2012; NGUYEN, 2020).

On the organisational front, firms employ internal knowledge-control mechanisms such as restricted access to sensitive information, process segmentation and the intentional dispersion of critical knowledge across different teams to hinder complete appropriation by external agents or unintentional leakage by employees (BERRY, 2017; ESTRIN; MEYER; PELLETIER, 2018; KLEIN, 2023). In parallel, companies invest in relational mechanisms, using human capital and organisational culture as barriers to the mobility of strategic knowledge, adopting retention programmes, cultural alignment initiatives and reinforcement of organisational values related to loyalty and confidentiality (MIOZZO; DIVITO; DESYLLAS, 2016; YANG, 2024).

Institutional mechanisms are also mobilised, such as joint ventures linked to local knowledge and long-term strategic agreements (international alliances), particularly in markets characterised by high institutional uncertainty (AIB, 2024; PENG, 2025). Furthermore, scholars highlight multi-level governance structures, whereby firms build internal architectures for the protection of intangible assets, such as compliance departments, intellectual property committees and internationalised legal offices – mechanisms that enhance the firm's ability to react to cross-border risks and promote the institutionalisation of protection (RUGMAN; VERBEKE, 2001; BUCKLEY *et al.*, 2022).

This theoretical discussion surrounding intangible assets and their relevance for competitive advantage across borders underscores the importance of examining the phenomenon of protection, given that international expansion exposes intangible assets to specific risks that demand strategic attention from firms. The literature points to an imperative scenario regarding the protection of intangible assets. While classical organisational and internationalisation theories explain why intangible assets are valuable, and recent studies confirm their centrality to the performance of internationalised firms (OH; OETZEL, 2022; SATO; PANIBRATOV, 2023; PRUD'HOMME; TONG, 2024), a theoretical and empirical gap remains concerning a structured and holistic understanding of how firms in internationalisation contexts orchestrate protection mechanisms in the face of heterogeneous risks. This fact is reinforced by Oviatt and McDougall (1994) seminal article, when they highlight the importance of protecting such unique resources against the risks of dissemination, imitation and the emergence of substitutes. The authors also

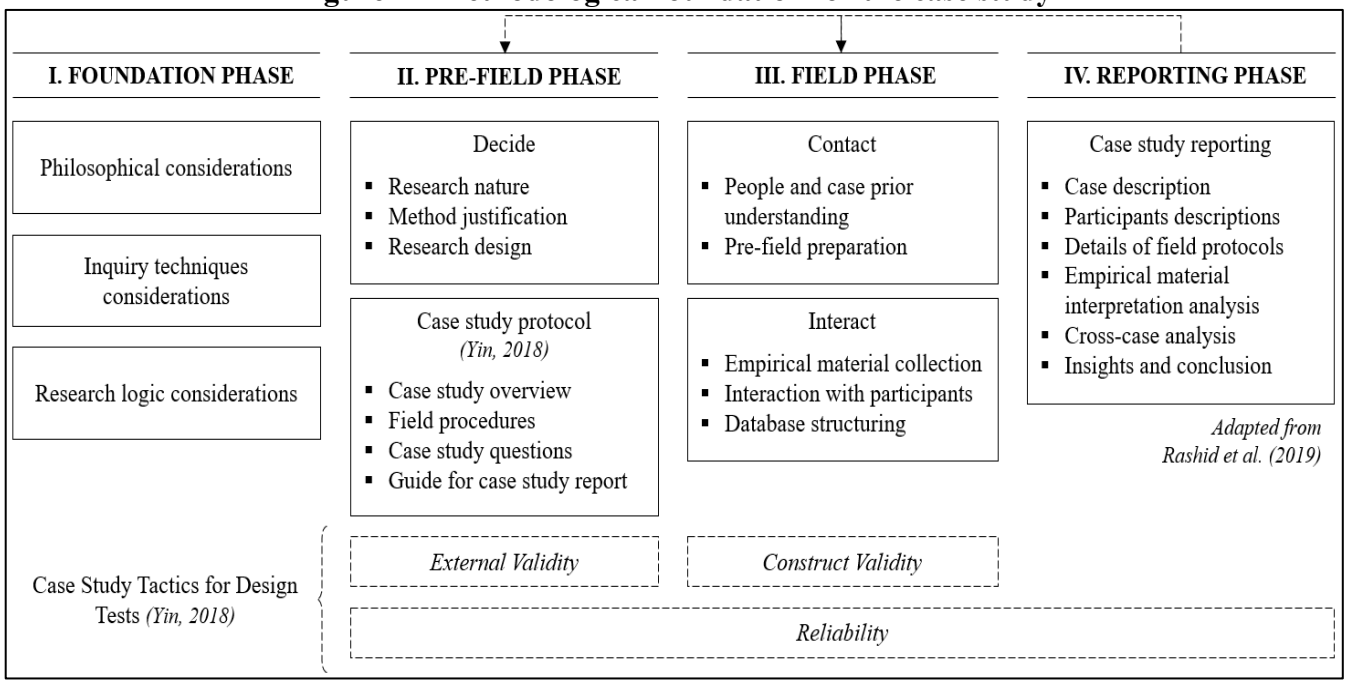
suggest conditions and forms of protection of the value captured from these assets (e.g. intellectual property protection, licensing of knowledge, networks) but reinforce that "empirical research is needed to understand the differential success of these mechanisms more completely" (OVIATT; MCDOUGALL, 1994, p. 39). It is precisely at this intersection between theory and practice that this research is positioned, seeking to identify insights that contribute to the field of international business from both scholarly and managerial perspectives.

METHODOLOGY

A qualitative research approach through a case study is the most appropriate research design for this work considering its contemporary and explanatory nature (EISENHARDT, 1989; YIN, 2015; CRESWELL; CRESWELL, 2018) and its search for non-binary answers to understand a situation's complexity in-depth through open-ended questions (GEORGE; BENNETT, 2005; YIN, 2015; CRESWELL; CRESWELL, 2018) and a high volume of secondary data sources, allowing a full picture of the cases. Qualitative approaches are considered reliable as long as rigorous procedures guarantee the quality of the obtained results (KALLIO *et al.*, 2016), and the fact that they do not make statistical (but rather analytical) generalizations does not mean that they do not have valid and relevant contributions (WELCH *et al.*, 2011).

To guarantee methodological rigour, this study used as a methodological foundation a mix of well-structured approaches from contemporary literature. On the one hand, Rashid *et al.* (2019) provide a guideline for conducting case studies – a systematic and replicable approach that increases the transparency and reliability of qualitative research. On the other, Yin (2018) provides broad and transversal assistance throughout the entire guideline used, such as in justifying the choice of method (the "why" of the case study) and the case study tactics for design (e.g., case study protocol, data triangulation). The combination of these authors' contributions is represented in Figure 1. Recent research has also replicated the methods of these both authors together (MANDRINOS; LIN; SALLEH, 2024, SCHIAVONE *et al.*, 2024; CAMPOS JUNIOR *et al.*, 2024; LIMA *et al.*, 2024), demonstrating the replicability, validity, and rigour of the methodological foundation proposed for this study.

Figure 1 - Methodological foundation for the case study



Source: Self elaboration. Adapted from Yin (2018); Rashid *et al.* (2019).

The methodology unfolds as follows:

I. Foundation phase:

This phase consists of clarifying the researchers' philosophical premises. This study focuses on a relativistic ontological view and an interpretivist epistemological view (VAN DE VEN, 2007; LINCOLN; LYNHAM; GUBA, 2011; RASHID *et al.*, 2019), aligning with the constructivist (interpretivist) paradigm (LINCOLN; LYNHAM; GUBA, 2011; CRESWELL; CRESWELL, 2018). Given the available inquiry techniques (i.e. quantitative and qualitative) stated by Rashid *et al.* (2019) and the authors' philosophical lens, this study adopted a qualitative approach to understand the phenomenon by exploring information with individuals in a given context (CRESWELL; CRESWELL, 2018). In addition to the research logic, this study adopts a theoretical-deductive method. As advocated by Popper (1959), this approach starts from the identification of a potential gap in established knowledge (in this study, the insufficiency of explanations about the mechanisms for protecting intangible assets in internationalisation contexts) for the subsequent confrontation between theory and explanatory mechanisms in light of empirically obtained data. In this way, theoretical constructs and propositions are used to guide the research design, data collection and analysis with a view to generating analytical generalizations and theoretical refinement (FIFE; GOSSNER, 2024).

II. Pre-field phase:

The second step of the guideline corresponds to the discussion and design work prior to the field phase. Regarding its aims, this research is classified as explanatory. In the context of this work, the explanatory character lies in the search to understand the causal relationships between the nature of intangible assets, organizational specificities, and internationalization trajectories in defining the protection mechanisms adopted. According to Gil (2019), this type of investigation has as its main objective to identify the factors that relate to the occurrence of the observed phenomena, deepening the knowledge of reality to explain the reason of things.

Regarding the means, the study operationalizes the deductive method through bibliographic research integrated with a multiple case study. The bibliographic stage acted as the main basis that allowed the construction of the analysis and theoretical foundation from the scientific literature already elaborated in the field (VERGARA, 2016). On the other side, case studies are recommended for in-depth investigations of a contemporary limited system involving a given context and multiple sources of information (EISENHARDT, 1989; YIN, 2015; CRESWELL, 2018). Such characteristics align with this study's context, objectives, and the explanatory nature of its research question (i.e. "why question"), making the case study method appropriate (YIN, 2015). Also, the research design adopted was a multiple case study, with cases selected based on theoretical criteria, in order to reduce scepticism about potential peculiarities or artisanal conditions of an isolated case (YIN, 2015). Despite the impossibility of statistical generalization, a multiple case study contributes significantly to theory creation by comparing different case evidence (FLETCHER *et al.*, 2018). These design definitions reinforce external validity, while the structured case study protocol reinforces the reliability of the adopted approach (YIN, 2018). The integration of these methods through deductive practices allows for comparisons, adjustments, and the advancement of theory in light of empirical evidence (LAKATOS; MARCONI, 2021).

Case study protocol

Rashid *et al.* (2019) describes the case study protocol as a step-by-step that supports the researcher in prior preparation to the field work, covering topics such as questions, approaches and methods related to research. Using the case study protocol proposed by Yin (2018) and Rashid *et al.* (2019) as a basis, the following research guidelines were defined:

Case study overview – This study aims to contribute to academic knowledge and managerial practice by answering the main research question: "*How do technology-based Brazilian firms operating*

abroad protect their intangible assets in the international market?". The authors carried out a multiple case study selecting Smarthis and Tabia Health, Brazilian technology-based companies. The cases were selected through theoretical sampling (EISENHARDT; GRAEBNER, 2007), aiming an in-depth analytical generalization (GIBBERT; RUIGROK; WICKI, 2008) and based on the following criteria: (i) being an internationalized Brazilian company; (ii) having a business model directly based on intangible assets; (iii) should explore some of its intangible assets abroad; (iv) openness to participating in this research. These selection criteria sought to ensure that the phenomenon of intangible asset protection in an international context could be analysed in the chosen cases.

Field procedures – All field procedures sought to ensure the research was carried out ethically in terms of responsibility, originality and transparency (YIN, 2018). Permissions through consent forms were provided, and all agreements regarding privacy and confidentiality were maintained (RASHID *et al.*, 2019). Different practices ensuring validity and reliability were adopted (GIBBERT; RUIGROK; WICKI, 2008). Reliability strategies throughout all the research stages included protocols, interview semistructured guides, checking transcripts, and a solid database (GIBBERT; RUIGROK; WICKI, 2008; CRESWELL; CRESWELL, 2018). Validity strategies included using multiple sources of evidence, data triangulation, member checking with participants, and peer debriefing (YIN, 2018; CRESWELL; CRESWELL, 2018).

Case study questions - More than a mere instrument, Yin (2018) states that protocol questions help keep researchers on track with the study by questioning participants and themselves around the case. Questions in a case study can be classified into different levels, with level 2 (researchers' investigation questions) and level 1 (specific questions to interviewees) being fundamental (YIN, 2018). Level 2 questions were determined to guide the analysis and discussion process around the case, and Level 1 questions were developed to support the data collection process during the interviews. Integrated with the semi-structured interview guide proposed by Kallio *et al.* (2016), a data collection guide synthesized into five dimensions of analysis (proposals based on the reviewed theories/bibliographies) and directly linked to the main research question was consolidated in Chart 3.

Guide for case study report – It is recommended that the case study protocol provides a tentative outline for the final report (YIN, 2018). A "story-like" writing style was used for each case, complemented by visual elements, with specific sections for evidence, description, and a cross-analysis. The researchers also adopted good reporting practices by outlining a preliminary structure that would help describe and analyse the case, its participants, the details of the field and other descriptions referring to the context studied (RASHID *et al.*, 2019).

Chart 3 - Semi-structured interviews guide for data collection

Dimension of analysis	Purpose	Level 2 Questions *(research questions to be answered by researchers) (Yin, 2018)*	Examples of Level 1 Questions *(specific questions asked of interviewees in the field) (Yin, 2018)*
Firm specific context	General understanding of the context and case, as well as the firm, participants and other objects of interest in the case study	▪ How are the context and case presented and characterized? ▪ What is the firm's history? And which details of the firm are relevant to the future analysis of the case?	▪ What is the role of the interviewee in the firm? ▪ What is the story behind the founding of the firm? ▪ What is the firm's current situation in terms of market positioning? ▪ What is the firm's vision for the future?
Intangible assets	Obtaining an overview of the intangible assets owned and/or exploited by the firm	▪ What types of intangible assets does the firm own? ▪ How important are these assets for its competitiveness?	▪ What intangible assets does the firm own and exploit? ▪ How were such intangible assets obtained? ▪ How does the firm exploit its intangible assets? ▪ Is there any strategic use of intangible assets for the firm?
Internationalisation process	Understanding of the internationalisation journey of the analysed firm and the role of its intangible assets on this	▪ How did the firm's internationalisation process develop (e.g. entry mode, operations)? ▪ Which theoretical lens best fits the internationalisation of the firm? ▪ What is the role of intangible assets in this journey?	▪ In which countries do the firm operate? Why did the firm decide to operate in such countries? ▪ What were the first steps to operating in the foreign market? ▪ How are intangible assets exploited abroad? Does such exploitation vary depending on the country?
Risks and threats	Understanding the participants' perspective regarding the risks and threats generated to the firm by the lack of protection of intangible assets	▪ What risks and threats does the lack of protection of intangible assets generate for the firm (if any)? ▪ Is there a real perception on the part of the firm regarding the risks and threats to the business?	▪ What risks or threats have the firm identified in relation to its intangible assets (if any)? ▪ How can these risks and threats impact the business? ▪ In what ways does the firm mitigate such risks and threats (if at all)?
Protection mechanisms	Assessment of intangible assets protection mechanisms adopted (or not) by the firm	▪ What protection mechanisms do firms use (if at all) to protect their intangible assets abroad? ▪ How and why did the firm decide to use these protection mechanisms?	▪ Did any action have to be taken by the firm to protect its assets externally? If yes, which and why? ▪ Does the firm protect its intangible assets? If so, why and in what ways? ▪ Does the firm identify difficulties in protecting its intangible assets? If so, which ones?
⬆ **Research Question:** How do technology-based Brazilian firms operating abroad protect their intangible assets in the international market? ⬆			

Source: Self elaboration. Adapted from Yin (2018).

III. Field phase:

To substantially increase the quality of the case study and of the subsequent analysis, multiple sources of primary and secondary data were used, which allowed for capturing the phenomenon in depth and reducing biases associated with a single source of evidence (YIN, 2018). The main instrument for collecting primary data consisted of semi-structured in-depth interviews, using as a basis the structured framework proposed by Kallio *et al.* (2016) to increase trustworthiness throughout the entire process. The interviews were conducted online (lasting 50 - 80 minutes each) and were carried out with three top-tier decision-makers of each firm, such as founders, C-levels and functional heads (as described in chart 4), following a dynamic based on open-ended questions (as shown in the interview guide). All interviews were recorded (with authorization), and its more than 6 hours of content were transcribed, fully analysed, and its main insights were validated by the interviewees (i.e. member checking) as a good construct validity practice (GIBBERT; RUIGROK; WICKI, 2008; YIN, 2018).

Chart 4 - Cases in-depth interviews

Firm	Smarthis			Tabia Health		
Name	Allexley Bernacchi	Marcos Almeida	Rodrigo Ferreira	Ricardo Clemente	Carlos Kremer	Edison Silva
Position	CEO and Founder	COO and Partner	CTO and Founder	President and Founder	Head of Product	COO
Year of admission	2018	2020	2018	2022	2022	2023
Interview duration	51 min	80 min	79 min	55 min	63 min	54 min

Source: Self elaboration.

Authors also performed desk research for data collection from different sources, resulting in a good diversity of secondary data of each company with a documentary and archival nature. Secondary data included internal documents of the firms (e.g. presentations, reports, archival records), public podcasts and interviews videos, relevant information retrieved from firms' websites, and a wealth of articles in the press (e.g. sectorial news, business sources, newspapers, press releases). This data allowed for the contextualization of the interviewees' narratives, verification of the consistency of the information, and enrichment of the understanding of the phenomenon analysed. All secondary data used were collected, analysed and archived in a database with all collected primary data, allowing retrieval and subsequent revisions by authors.

IV. Reporting phase:

The reporting phase represents the critical analysis around the narrative emerging from the field data (CRESWELL; CRESWELL, 2018). A linear-analytic compositional structure (YIN, 2018) was used, starting with the research question and methodology framework, followed by data collection, analysis, and conclusions arising from the studied cases (YIN, 2018; RASHID *et al.* 2019). The data analysis followed an analytical-deductive logic (YIN, 2018), guided by theoretical propositions (i.e. dimensions of analysis previously established). Initially, a within-case analysis was conducted, in which each company was examined individually (EISENHARDT, 1989), seeking to understand its context, internationalization trajectory, strategic intangible assets, perceived risks, and adopted protection mechanisms. Subsequently, a cross-case analysis was performed, based on systematic comparison, as proposed by Eisenhardt (1989) and Yin (2018). This step aimed to identify convergent and contrasting patterns between the cases, as well as to elucidate the explanatory mechanisms underlying the observed differences.

The adopted triangulation design was theoretical-methodological and source-based, in which the combination of different theoretical perspectives, the integration of methodological approaches, and the

use of multiple sources of evidence was intentionally adopted to strengthen the analytical rigor of the study (YIN, 2018; FLICK, 2018; MADUGU; IBRAHIM, 2024). From a theoretical point of view, the research was based on the triangulation of different theories from the fields of international business and organizations, which functioned as complementary analytical lenses to interpret the phenomenon of intangible asset importance, vulnerabilities and protection. From a methodological perspective, triangulation was achieved through the combination of bibliographic research and diverse empirical practices derived from multiple case study. Regarding sources, different pieces of evidence (i.e. primary and secondary collected data) were systematically confronted throughout the analysis, allowing for verification of their consistencies, reduction of individual perception biases, and reinforcement of the robustness of the inferences. This triangulation design allowed for the construction of a chain of evidence to answer the research questions (YIN, 2018; RASHID *et al.* 2019), ensure the saturation achievement, and guarantees construct validity and reliability through the four principles of Yin (2018): use of multiple sources, creation of a database, chain of evidence, and attention to data use.

The analysis and discussion section was structured to report both cases aligned with the level 2 research questions (YIN, 2018), unfolding in the presentation of the firms, its internationalisation processes, its strategic intangible assets, protection mechanisms, and potential risks and threats. Also, the analytical strategy based on theoretical propositions was used to perform a cross-analysis (YIN, 2018), where conclusions about the research questions were drawn up based on the chain of evidence arising from the data collected and the insights generated (i.e. theoretical guidelines guiding the analysis of the cases). The reporting ends with the compilation of the main outputs and conclusions of this study.

ANALYSIS AND DISCUSSION

This cross-case analysis and discussion aimed to identify convergences, contrasts and underlying mechanisms, adopting the dimensions of analysis (derived from bibliographic research) as explanatory mechanisms, reinforcing the analytical-deductive logic adopted (YIN, 2018). Additionally, the adopted approach combines categorical logic (EISENHARDT, 1989), systematic comparison and causal explanation (WELCH *et al.*, 2011) by articulating the empirical evidence observed from both cases.

Firms Specificities, Intangible Assets Nature and Internationalisation Trajectories

International business research consistently shows that firm-specific advantages are shaped not only by asset ownership but also by business models, sectoral constraints and governance structures that

condition both exposure to risk and strategic responses (BUCKLEY *et al.*, 2022; WAN; WILLIAMSON; PANDIT, 2024). The selected cases – Smarthis and Tabia Health – represent distinct manifestations of technology-based firms, offering a rich basis for comparative analysis (EISENHARDT, 1989; WELCH *et al.*, 2011). Each firm's specificities (e.g. business model, sector, organisational architecture and maturity) reinforce distinct patterns regarding intangible assets, associated risks and protection mechanisms.

Although Smarthis and Tabia Health are both Brazilian, technology-based firms intensive in intangible assets, they operate in markedly different organisational and sectoral contexts. Smarthis, founded in 2018, provides specialised consulting services in Robotic Process Automation (RPA), Data Science and Analytics, Artificial Intelligence (AI), and Support and Maintenance. It operates as a knowledge-intensive business service - KIBS (MILES *et al.*, 1995), whose value depends directly on knowledge quality, human interactions, customised delivery and the ability to maintain cultural coherence across distributed teams. Conversely, Tabia Health, established in 2022, is a healthtech that provides services via its digital platform (based on proprietary software) that orchestrates primary-care pathways at scale, improving operational efficiency for its clients (healthcare providers) and the quality of patient treatment. It operates in a sector characterised by strong regulation, stringent compliance requirements and international regimes for health-data and intellectual property protection, and its value proposition is anchored in scalable software and data processing, positioning it closer to the logic of codified assets and strict compliance requirements (GRANT, 1996). These distinct organisational contexts and specificities constitute the initial boundary conditions that shape their respective approaches to asset protection, also being a foundational explanatory mechanism for interpreting heterogeneous protection strategies over the different types of intangible assets held by companies.

The nature of intangible assets is the element that allows us to understand the differences and similarities between the firms studied here. In both descripted cases, the business models, internationalisation journeys and competitive differentiation are predominantly based on knowledge (mainly technological, managerial and market knowledge, among others) – aligning with KBV (GRANT, 1996) – and ownership advantages based on intangible assets, being aligned with the Eclectic Paradigm of Dunning (1977). In Smarthis, this knowledge materialises as technical expertise combined with a strongly collaborative, excellence-oriented organisational culture. In Tabia, it is observed in development and operational capabilities, regulatory expertise in healthcare, and the managerial/market experience accumulated by the founders. Relationship networks (personal and organisational), reputation and brand also emerge as critical assets in both cases, serving as a credibility tool for global projects (Smarthis) and

as a signal of market trustworthiness and regulatory compliance (Tabia). The analysis confirms the centrality of intangible assets as the core of FSAs for both firms, aligning with Sato and Panibratov (2023).

Despite this, the nature of the assets of both firms differs substantially in their positioning along the tacit–codified asset continuum. This continuum describes the degree to which an asset can be formalised, documented, combined and effectively transferred (GRANT, 1996). Tacit assets, as in Smarthis (e.g. specialised human capital, organisational culture, relationship networks), rely heavily on human interaction, experiential knowledge accumulation and cultural alignment (KOGUT; ZANDER, 1992, 1996; SCHIAVONE *et al.*, 2024). Codified assets, as in Tabia (e.g. proprietary software, algorithms, procedures and datasets), are more formal, more readily transferable and more easily replicated (GRANT, 1996; AMANKWAH-AMOAH; BOSO; KUTSOATI, 2022). Thus, although both firms depend intensively on intangible assets, the ways in which these assets generate and sustain competitive advantage differ markedly. This structural distinction suggests that the predominant nature of each asset (e.g. degree of codifiability/tacitness) constitutes an important perspective for explaining why each firm faces different types of risks and threats and therefore adopts distinct protection mechanisms during internationalisation.

The comparative analysis of Smarthis' and Tabia's internationalisation trajectories – which differ substantially in purpose, pace, entry mode and operational logic – reveals that how a firm expands abroad decisively conditions the nature of risks to its intangible assets, producing distinct configurations of exposure and, consequently, protection mechanisms. Smarthis adopts a client-following (COVIELLO; MARTIN, 1999) trajectory, in which international entries occur opportunistically, pulled by multinational clients in pre-existing networks. This logic initially exposes relational, cultural and applied-knowledge tacit assets, intensifying risks of intercultural misalignment, knowledge erosion and variations in delivery quality. Tabia follows a typical born-global trajectory (RENNIE, 1993; KNIGHT; CAVUSGIL, 1996), marked by strategic decision and simultaneous expansion in Brazil and the USA from inception. Its early international exposure involves codified assets, orienting risks toward institutional and technological issues (e.g. intellectual property, data governance, licensing, and regulatory legitimacy). This divergence in trajectories generates distinct dynamics of exposure and protection for intangible assets, providing a basis to understand the firms' different protection strategies.

Despite differences in entry mode logic, both firms somehow share a common feature: they internationalise relying on pre-existing relations (even if in different ways and degrees) – a practice explained by network-driven theory (JOHANSON; MATTSSON, 1988). Smarthis does so through multinational clients that "pull" its presence into other countries, while Tabia leverages the founders' and executives' international networks, whose prior experience in the USA ecosystem enabled initial access to clients, partners and investors. This relational dependence is a structural similarity in the origin of

expansion, albeit with distinct effects. For Smarthis, following clients implies exposing essentially tacit assets to coordination risks across countries (COVIELLO; MARTIN, 1999). For Tabia, networks act as strategic levers for market entry and legitimisation (DYER; SINGH, 1998), reducing institutional barriers and accelerating USA market access (without constituting the firm's operational core). Thus, relational internationalisation in Smarthis deepens cultural and operational vulnerabilities, whereas in Tabia it mitigates initial institutional uncertainty without amplifying cultural risk, illustrating how the same mechanism (i.e. networks and relationships) assumes profoundly different roles and intensities across firms. These differences and convergences show that international trajectories shape not only how firms position themselves abroad but also the specific risks that befall their intangible assets. Distinct trajectories interact with asset nature and firm context to produce differentiated configurations of asset vulnerability, which helps explain why firms mobilise divergent protection mechanisms overseas.

Risk Profiles Emerging from the Firm-Asset-Internationalisation Configurations

In both cases, interviewees were aware that internationalisation exposes the firms' intangible assets to new forms of uncertainty abroad. The firms perceived risks and threats demonstrate how different configurations of intangible assets, firm specificities and international trajectories produce distinct patterns of vulnerability abroad. Smarthis deals primarily with risks related to preserving tacit knowledge, interpersonal relations and cultural alignment in distributed operations, while Tabia faces risks associated with protecting codified and sensitive assets, notably its software, patient health data and regulatory compliance. Thus, risks do not emerge solely from international exposure per se but as direct consequences of the articulation among assets, trajectories and institutional contexts that characterise each firm.

Nonetheless, Smarthis and Tabia share transversal risks deriving from their knowledge-intensive business models. In both firms, talent loss is a critical threat, not only because it reduces operational capacity, but principally because it entails dispersion of technical, relational and/or specialised knowledge (ESTRIN; MEYER; PELLETIER, 2018; BELDERBOS; PARK; CARREE, 2021; CUI *et al.*, 2022). Similarly, both face risks related to weakening strategic relationships: in Smarthis, associated with deteriorating trust and client alignment in multicultural settings; in Tabia, linked to dependence on the founders' networks for access to the USA ecosystem. These common risks underscore the fragility inherent to knowledge-based firms (YOO; REIMANN, 2017; ZHANG; JIANG, 2018), whose international competitiveness depends on retaining key personnel, maintaining relational ties, and

sustaining organisational learning, although the nature and intensity of these risks vary across the two companies.

Contrasts become clearer when observing how the combination of asset nature, firm context and international trajectory yields substantially different risk configurations. In Smarthis, where competitiveness rests on strongly tacit socially embedded assets, risks concentrate on cultural erosion, tacit knowledge dispersion and weakening ties with foreign clients – risks that are amplified by an opportunistic, distributed and sustained by intensive human interactions internationalisation model (COVIELLO, 2006). In Tabia, which is operating in a regulated sector and based on highly codified assets, vulnerabilities shift toward IP violation, unauthorised appropriation of technology, inconsistencies in data governance and regulatory/compliance sanctions (NGUYEN, 2020; AMANKWAH-AMOAH; BOSO; KUTSOATI, 2022; CUI *et al.*, 2022). Hence, while Smarthis faces principally relational and cultural risks stemming from tacit knowledge dependence and interpersonal practices, Tabia confronts institutional and technological risks associated with the fragility of codified assets in regulated environments. These contrasts reinforce that, although both firms can be considered knowledge-intensive, the ontological nature of assets, firm contexts and internationalisation process shape different qualitative and structural vulnerabilities.

In short, tacit intangible assets are less susceptible to technical misappropriation and related risks but are highly vulnerable to cultural misalignment, deterioration of client and partner ties, employee attrition and dispersion of tacit knowledge – a finding consistent with KBV logic (GRANT, 1996). Codified intangible assets, conversely, are more easily transferable and replicable and thus more prone to IP erosion, reverse engineering and legal/regulatory breaches in international settings (BELDERBOS; PARK; CARREE, 2021; BUCKLEY *et al.*, 2022). Accordingly, Smarthis and Tabia operate with intangible assets at opposite ends of the tacit–codified continuum, which in turn directly influences their degree and ways of exposure to risks and threats.

Protection Mechanisms as Dynamic Responses

The comparison between Smarthis and Tabia shows that the protection mechanisms adopted directly reflect the specific risks faced (whose configuration is closely connected to the nature of the assets, organizational specificities, and firms' internationalisation trajectories). Although both firms combine formal instruments and organisational practices, the emphasis placed on each set varies markedly. The most striking differences concern the relative emphasis on types of protection mechanisms. Smarthis, whose value is sustained by tacit assets, focuses on people management, organisational culture

and trust-building with clients as primary risk-mitigation strategies (KLEIN, 2023; YANG, 2024; ARRUDA *et al.*, 2024). Tabia, operating with predominantly codified assets, relies mainly on formal and institutional mechanisms such as IP protection, data governance, external audits and compliance with international regulatory regimes (NGUYEN, 2020; LEE, 2023). Thus, while Smarthis protects its assets via organisational and relational channels, Tabia does so through formal and technical-procedural channels.

Nevertheless, Smarthis and Tabia share a set of transversal protection mechanisms aimed at safeguarding critical assets. Both use basic formal instruments (e.g. contracts, confidentiality clauses, trademark registrations) and acknowledge talent retention as crucial to preventing the dispersion of specialised knowledge. They also converge in adopting organisational practices that reinforce delivery quality and relationship reliability via staff socialisation, process standardisation or strengthening client ties. These elements indicate that, in knowledge-intensive firms, intangible-asset protection depends simultaneously on legal safeguards and on management practices oriented to preserving know-how and strategic relationships.

The identified contrasts in protection strategies reveal an important explanatory mechanism for why Smarthis and Tabia structure their protection approaches differently. The greater the predominance of codifiability of an intangible asset, the higher the reliance on formal protection mechanisms. Conversely, the greater the predominance of tacit characteristics, the greater the reliance on organisational, relational and cultural mechanisms. These findings complement resource- and knowledge-based theories (BARNEY, 1991, 2001; GRANT, 1996), adding the lens of intangible asset protection to them. However, although it has been identified that the nature of intangible assets plays an important role in risks configuration and protection logic, it is important to note that the adoption of protection mechanisms is a dynamical configuration of interrelated factors due the fact that it is also determined by the interaction of assets with firm-specific contextual factors and internationalisation trajectories.

Integrative Synthesis: A Configurational Perspective

The cross-case analysis of Smarthis and Tabia demonstrates that the protection of intangible assets is not an isolated function of owned assets, firm solutions, sector or destination country, but a configuration that emerges from the interaction among three central explanatory mechanisms: (i) the ontological nature of intangible assets; (ii) firm specificities; and (iii) the internationalisation trajectory. These mechanisms, in combination, shape both the predominant risks faced by each organisation and the protection mechanisms deployed abroad, challenging linear perspectives that associate specific industries,

firm types or strategies with exclusively formal or informal protection measures. This major finding is in line with Buckley *et al.* (2022), that stated that firms' specificities such as governance structures and business models expose firms to heterogeneous vulnerabilities and guides their strategic responses to these. In Smarthis, the combination of tacit assets, a knowledge-based service model, relational networks and a client-following trajectory produces primarily cultural and relational risks, addressed through mechanisms focused on people management (e.g. training, financial and non-financial benefits), culture (e.g. global culture guidelines, manuals), client relationship management (e.g. local focal points, customised teams) and knowledge protection (e.g. continuous innovation, service specificity). In Tabia, the combination of codified assets, the operation as a regulated healthtech, and the born-global trajectory generates institutional and technological risks, resulting in dominant use of formal protection mechanisms (e.g. patents, trademark registration), deployment in safe international environments (e.g. countries with greater protection to IPR), data-protection measures (e.g. compliance certifications, hardware encryption) and knowledge-protection practices (e.g. stock plans, cultural strengthening). Chart 5 summarises the configurational approach observed and supports comparative analysis of both cases to identify convergences and contrasts.

Chart 5 - Summary of the analysis of the configurational approach of each case study

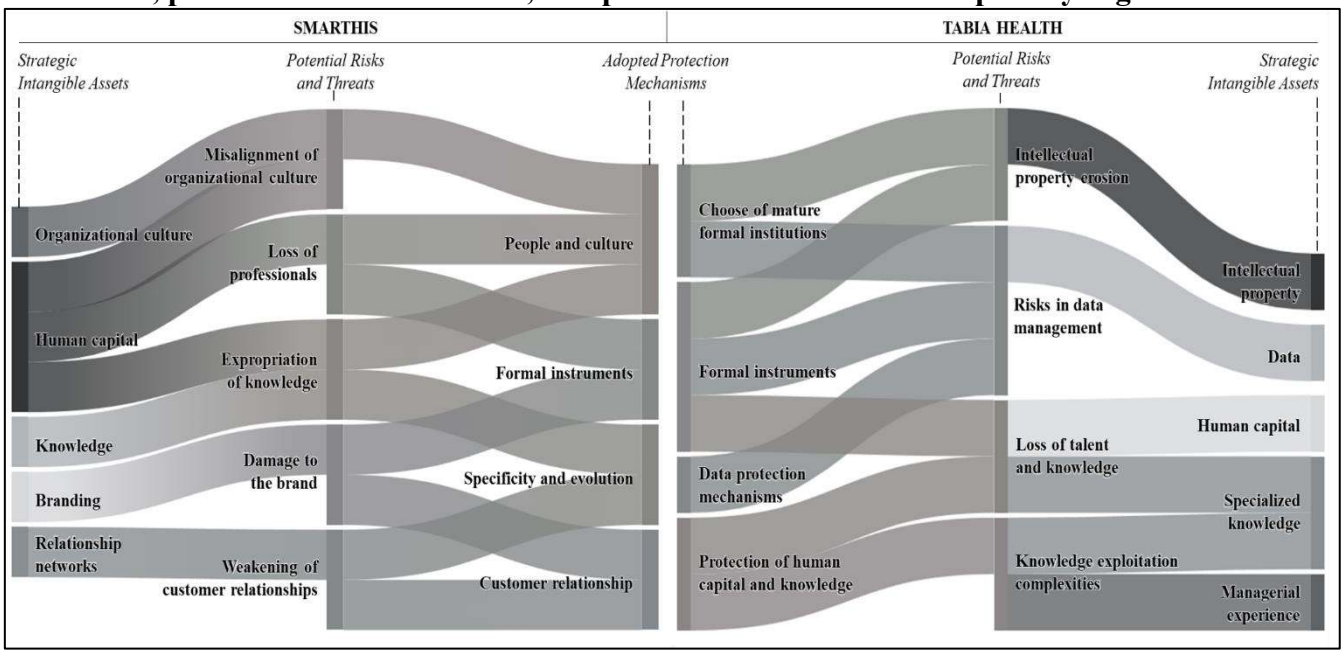
Firm	Smarthis	Tabia Health
Intangible Assets Nature	Predominantly assets with tacit characteristics (e.g. human capital, culture, networks, applied knowledge)	Predominantly assets with codified characteristics (e.g. proprietary software, data, regulatory processes, IP)
Firm Specificity	Knowledge-intensive business service (KIBS), operating on personalized delivery and human interaction	Healthtech with a highly regulated operation, based on technology, compliance, and sensitive data
Internationalisation Journey	Client-following strategy, driven by networks and opportunities; organic expansion	Born-global strategy; internationalisation planned from the start; focus on the USA through strong formal institutions
Risks and Threats	Risks are primarily cultural and relational (e.g. cultural misalignment, knowledge dispersion, talent loss, weakened customer relationships)	Risks are primarily institutional and technological (e.g. IP erosion, reverse engineering risks, compliance failures, and data governance issues)
Protection Mechanisms	Protection based on social and organizational cohesion (e.g. people management, cultural strengthening, technical expertise, local focal points, contracts, and confidentiality)	Protection based on formalization and institutional control (e.g. patents, trademark registration, data governance, internal controls, retention of key executives)

Source: Self elaboration.

The relationship among central intangible assets, potential risks and threats, and the protection mechanisms adopted by the studied firms is synthesised in the Sankey diagrams in Figure 2, a schematic representation that facilitates an integrated analysis of these parameters for generating research and managerial insights in a mutual beneficial way (VAN DE VEN, 2007). For example, the diagram makes clear which intangible assets emerge as critical vulnerability nodes (e.g. human capital for Smarthis and specialised knowledge for Tabia), as well as which protection mechanisms are most versatile in addressing

diverse risks and threats (e.g. people and culture for Smarthis and formal instruments for Tabia). Based on these findings and the cross-case analysis grounded in the central explanatory mechanisms, it is possible to assert that the protection of intangible assets is a phenomenon in which risks and protection mechanisms are not determined by isolated factors but by the specific configuration among intangible asset nature, organisational specificities and international trajectory. This configurational perspective shows that firms may adopt different mechanisms despite exploiting similar intangible assets or facing similar threats. Conversely, firms may deploy the same mechanisms in response to diverse vulnerabilities. These observations underscore that protection patterns emerge from the articulation between internal and external characteristics, rather than from single parameters.

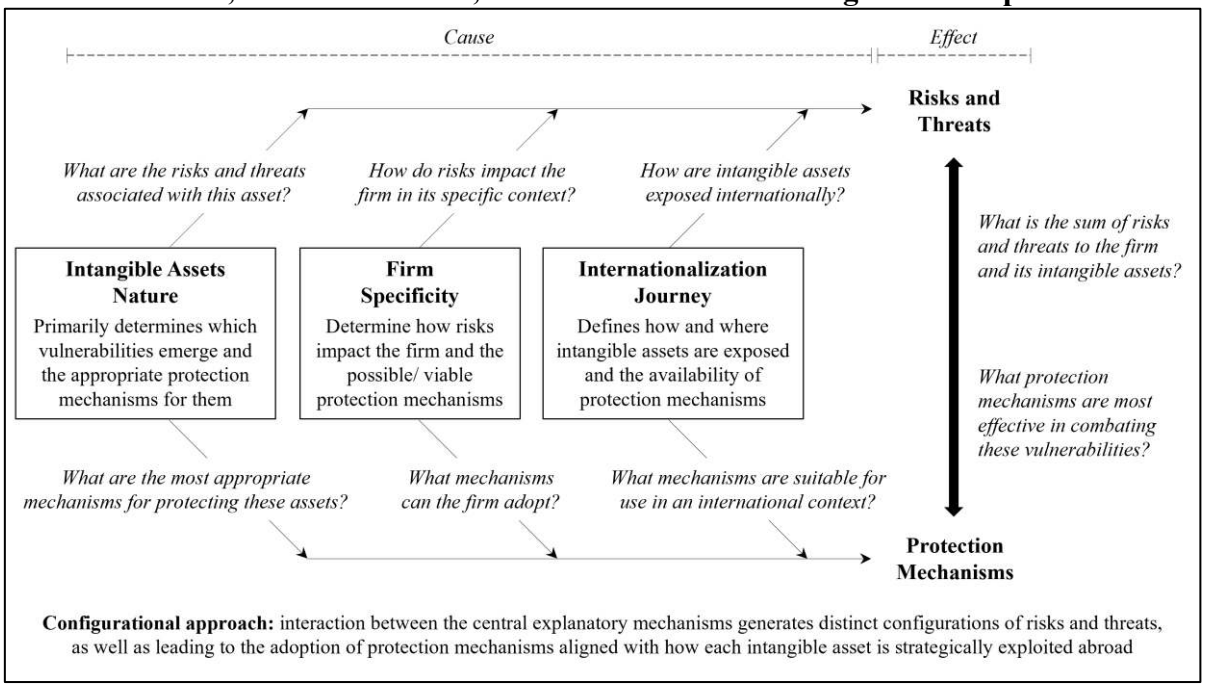
Figure 2 Sankey diagram of the relationship between strategic intangible assets, potential risks and threats, and protection mechanisms adopted by organizations



Source: Self elaboration.

The following framework condenses and analytically generalises (WELCH *et al.*, 2011; FIFE; GOSSNER, 2024) the configurational perspective emerging from this cross-case analysis, aiding the study of intangible-asset protection mechanisms in firms (Figure 3). This analytical generalization challenges the notion of a universal best practice for asset protection or the treatment of this subject from isolated perspectives, suggesting instead that firms architect a portfolio of mechanisms tailored to their specific asset-trajectory configuration.

Figure 3 - Framework of the configurational approach between explanatory mechanisms, risks and threats, and mechanisms for intangible assets protection



Source: Self elaboration.

In addition to the research question and findings being in line with the study objectives, this research also directly responds to the literature's call for greater integration between micro-foundational explanations (e.g. assets, capabilities, practices) and macro-institutional conditions (SANTANGELO; PHENE; COVIELLO, 2025). Additionally, it contributes to understanding phenomena surrounding emerging-market firms in international business – a topic still marginal in mainstream literature (BUCKLEY; DOH; BENISCHKE, 2017; DIELEMAN *et al.*, 2022) – thereby enriching debates on how Brazilian firms build and protect competitive advantage abroad.

CONCLUSION

Given the importance of intangible assets to various organisational theories and internationalisation theories, this article set out to understand how Brazilian technology-based firms protect their intangible assets when operating internationally. To do so, a multiple case study (structured in an integrated way with a bibliographic research on the topic) was conducted with two Brazilian technology based firms (Smarthis and Tabia Health), grounded in a methodological protocol that integrated contemporary guidelines and relying on extensive use of multiple sources of evidence, theoretical-methodological and source-based data triangulation, member checking and systematic construction of a chain of evidence. This theoretical-deductive method enabled an in-depth investigation

of the contemporary phenomenon of intangible-asset protection in internationalisation contexts, supporting theoretically grounded analytical generalisations.

The cross-case analysis showed that the protection of intangible assets is not determined in isolation by factors such as asset type, sector, business model or host-country context. Rather, it results from a specific configuration involving (i) the nature of intangible assets, (ii) firms' organisational specificities and (iii) their internationalisation trajectories. In the case of Smarthis, predominantly tacit assets — such as specialised human capital, organisational culture and relational networks — combined with a KIBS model and a client-driven international trajectory give rise to primarily cultural and relational risks, which are mitigated through protection mechanisms centred on people, culture, client relationships and service specificity. In Tabia, highly codified assets — such as proprietary software, health data and regulatory knowledge — interact with a strongly regulated sector and a rapid born-global trajectory to generate institutional and technological risks, mitigated through formal instruments such as intellectual property, data governance, reliance on mature formal institutions and structured practices to retain and protect critical knowledge. By adopting a configurational approach, this study advances understanding of how different combinations of these explanatory mechanisms generate distinct patterns of risks, threats and protection arrangements in international contexts.

From a theoretical perspective, the study advances international business research by deepening the theoretical understanding of intangible-asset protection — a topic recognised as important yet still underexplored empirically. The theme of this research and its insights reinforce a perspective seldom explored by theories addressing the exploitation of intangible assets in international contexts. From a managerial standpoint, the study and its findings offer clear practical implications, mainly for firms highly dependent on intangible assets. Managers can use the proposed configurational framework as an analytical tool to systematically map how the nature of their intangible assets, their organisational specificities and their internationalisation trajectories interact to produce specific risks and to guide the prioritisation of protection mechanisms. This mapping and configurational analysis of intangible assets for decision-making resembles organisational portfolio management practices, enhancing governance and strategic effectiveness in the exploitation of intangible assets in international environments.

Like all multiple case studies, this research has limitations that must be acknowledge. Firstly, the limited number of cases analysed, while justified by the analytical depth and rigor of the adopted protocol, restricts the possibility of statistical generalizations (limiting the findings to the logic of analytical generalization) and does not capture the full heterogeneity of possible configurations among intangible assets, international trajectories and firm contexts. Secondly, the focus on Brazilian firms intensive in intangible assets, operating in specific sectors and with particular internationalization trajectories, may

limit the extrapolation of results to other country, sectoral, or institutional contexts. Moreover, interviewees were exclusively high-level executives, which provides privileged access to strategic information but may also narrow the range of perspectives on the phenomenon introducing biases associated with managerial perceptions and retrospective narratives. Although these limitations were mitigated through the use of a rigorous methodological approach, multiple sources of evidence, theoretical-methodological triangulation, member checking, and the construction of a chain of evidence, it denotes opportunities for further research.

Taking this study as a starting point, future studies may expand and test the proposed configurational framework across more diverse sets of intangible assets, firm characteristics (e.g. different business models, sectors, institutional contexts) and internationalisation trajectories (e.g. other emerging economies, varying institutional environments, diverse entry and operation modes). Methodological extensions are also recommended, including additional case studies (addressing this study's limitations or exploring new perspectives); qualitative/quantitative research capable of empirically testing the configurational propositions generated here; and longitudinal investigations exploring the evolution of such configurations over time as firms accumulate international experience, expand to new markets or face endogenous or exogenous shocks. Moreover, future research may delve more deeply into digital ecosystems and platform contexts, characterised by high asset intangibility, rapid digital transformation and the absence of geographic boundaries.

In summary, the results of this study show that the protection of intangible assets in the internationalisation process cannot be understood from isolated mechanisms or universal solutions, but rather from a dynamic configuration of interrelated factors. The central finding indicates that the nature of intangible assets constitutes the starting point for exposure to risks and for the choice of protection mechanisms mobilized by firms. Secondly, organisational and sectoral specificities modulate this relationship by reinforcing certain types of vulnerabilities and conditioning the viability of formal, organisational, or relational protection mechanisms. Finally, internationalization trajectories play a critical role in defining the timing, intensity, and institutional space in which such risks materialize, directly influencing the viability of adoption and the decision on the protection strategies adopted. By hierarchizing these three explanatory mechanisms and empirically demonstrating how their interaction generates distinct patterns of organizational risks and responses, the study contributes to a more refined and contextualized understanding of the protection of intangible assets in firms, offering relevant theoretical and managerial implications for sustaining competitive advantages in international environments.

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