THE POSITIVE FUNCTIONS OF TRADE SECRETS: INNOVATION, COMPETITIVE ADVANTAGE, AND EXTERNAL ECONOMIC DIPLOMACY IN THE CONTEXT OF 80 FIELDS OF APPLICATION

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ABSTRACT

This study examines the positive functions of trade secrets in the dimensions of innovation, competitive advantage, and external economic diplomacy within the context of eighty different application areas. In the knowledge-based structure of the global economy, trade secrets emerge as a fundamental legal and economic instrument that enables enterprises to gain competitive advantage by protecting their distinctive knowledge assets. The central research question addresses through which mechanisms trade secret protection strengthens innovation processes, enterprises' competitive capacity, and countries' external economic diplomacy effectiveness. The study hypothesizes that trade secret protection increases innovation capacity by encouraging research and development investments, consolidates competitive strength by supporting enterprises' differentiation strategies, and enhances external economic diplomacy effectiveness by establishing a reliable foundation for international cooperation. Designed as an analytical view article, this study presents a descriptive and analytical framework through a qualitative research approach. An interdisciplinary perspective has been constructed by integrating Schumpeter's creative destruction theory, Porter's competitive advantage theory, resource dependency theory, and institutional theory. The findings demonstrate that trade secret protection generates multi-layered effects extending from the micro level to the macro level, performing positive functions across a broad spectrum from small and medium-sized enterprises to multinational corporations, from supply chains to sectoral clusters. The research reveals that the concept of trade secrets is not merely a confidentiality mechanism but a determining variable in shaping economic development strategies, corporate governance practices, and international relations. The study provides actionable recommendations for innovation policies, competition law regulations, and external economic diplomacy strategies.

Keywords:

Trade Secret, Innovation, Competitive Advantage, External Economic Diplomacy, Corporate Knowledge Management.

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1. INTRODUCTION

Within the increasingly complex structure of the global economy, knowledge has become one of the most valuable factors of production. The protection and management of knowledge holds strategic importance in enabling corporations to achieve competitive superiority, in fostering the economic development of nations, and in shaping international relations. In this context, the concept of trade secrets emerges as a fundamental legal and economic instrument that safeguards the distinctive knowledge assets of enterprises, incentivizes innovative initiatives, and enables survival in global competition. In the era of the knowledge economy, the function of trade secrets extends beyond the mere preservation of confidentiality, transforming into a determinative role in the generation of corporate value, sectoral transformation, and the formulation of macroeconomic policies (Polanyi, 1966).

A trade secret is defined as any information possessed by an enterprise that carries economic value, is not publicly available, and for which reasonable measures have been undertaken to maintain its confidentiality. Within this definitional framework, formulas, production techniques, customer lists, pricing strategies, marketing plans, and algorithms may all be evaluated within the scope of trade secrets. Trade secret protection, unlike the patent system, provides a safeguard that continues as long as the information remains confidential, without being contingent upon any registration process. This characteristic renders trade secrets a preferred instrument of protection, particularly in rapidly evolving technology sectors and process-oriented innovations (Arrow, 1962).

The concept of innovation constitutes one of the fundamental driving forces of economic growth and societal progress. When evaluated within the framework of Schumpeter's theory of creative destruction, innovation signifies the transformation of existing economic structures and the initiation of new value creation processes. From this theoretical perspective, trade secret protection ensures the sustainability of research and development investments by safeguarding the economic returns of innovative initiatives. Firms allocate resources more boldly to innovation activities when they are assured that the distinctive solutions they develop will not be readily imiated by competitors (Schumpeter, 1942).

Competitive strength is a multidimensional concept that determines the position of enterprises at the micro level and nations at the macro level within global markets. When approached in accordance with Porter's theory of competitive advantage, competitive strength is shaped through cost leadership, differentiation, and focus strategies. Trade secrets fulfill a critical function in the implementation of each of these strategies. While distinctive production processes confer cost advantages, unique formulas and designs support differentiation strategy. Specialized knowledge directed toward niche markets constitutes the foundation of focus strategy (Porter, 1985).

External economic diplomacy refers to the entirety of diplomatic activities conducted by states with the objective of defending and advancing their economic interests in the international arena. This concept manifests itself across a broad spectrum, ranging from trade negotiations to investment agreements, from technology transfer to the protection of intellectual property rights. The protection of trade secrets constitutes a significant component of external economic diplomacy. The provision of a reliable legal framework for foreign investors by countries, the sound conduct of international technology collaborations, and the ascent to higher echelons within global value chains are directly linked to the effectiveness of the trade secret regime (Maskus, 2000).

When evaluated from the perspective of resource dependence theory, enterprises must acquire critical resources from their environments in order to survive and grow. Knowledge constitutes one of the most strategic of these resources. Trade secret protection strengthens the autonomous decision-making capacities of enterprises by shielding their knowledge resources from external interference. This circumstance holds determinative importance, particularly with regard to the

preservation of power balance in supply chains and business partnerships. Firms are able to establish deeper collaborations and form strategic alliances when they are confident that their confidential information is secure (Pfeffer & Salancik, 1978).

When approached from the standpoint of institutional theory, trade secret practices are influential in the formation of sectoral norms and legitimacy standards. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations. This process diffuses to other firms within the sector through mimetic isomorphism and ensures the institutionalization of knowledge management practices within the institutional field. Thus, trade secrets transform into a sectoral governance instrument beyond individual firm strategy (DiMaggio & Powell, 1983).

Trade secret protection holds particular significance for small and medium-sized enterprises. These enterprises generally lack the financial and administrative resources required by patent registration processes. The trade secret regime offers these enterprises the opportunity to protect their distinctive knowledge assets without entering into costly registration procedures. Craftsmanship-based production techniques, specialized approaches developed in customer relations, and strategic information pertaining to supply networks can be secured under trade secret protection. This circumstance enables small and medium-sized enterprises to compete with large corporations (Cohen & Levinthal, 1990).

With the process of digital transformation, the scope and modes of protection of trade secrets have also undergone significant transformation. Algorithms, data processing procedures, artificial intelligence models, and cloud-based systems rank among the most valuable trade secrets of the contemporary era. This circumstance necessitates the establishment of a strong nexus between cybersecurity and trade secret protection. The protection of digital assets by enterprises both secures their trade secrets and enhances their overall cyber resilience. Thus, trade secret awareness indirectly contributes to the development of the security infrastructure of the digital age (Almada-Lobo, 2016).

The protection of trade secrets in supply chains supports the establishment of long-term relationships based on mutual trust. Information sharing between suppliers and purchasers can become more comprehensive and profound when framed by confidentiality agreements. This circumstance prepares the ground for efficiency enhancement, quality improvement, and innovation diffusion throughout the entirety of the supply chain. Trade secret protection enables the establishment of an understanding of "I share while protecting and create mutual value" rather than the apprehension of "if I share, it will be stolen" (Williamson, 1985).

In sectoral innovation clusters, trade secret agreements fulfill a critical function in establishing the delicate balance between collaboration and competition. Firms operating in technoparks, organized industrial zones, and research centers are able to predetermine which information will be shared and which will remain firm-specific in joint projects. This framework enables the sound conduct of university-industry collaborations and the balancing of academic publication requirements with commercial confidentiality needs (Powell, Koput & Smith-Doerr, 1996).

In international trade and investment relations, the level of trade secret protection directly affects the attractiveness of countries. Multinational corporations carefully evaluate the information security infrastructure when determining the countries in which they will establish their research and development centers or regional management offices. Robust trade secret legislation and effective judicial processes contribute to the increase of foreign direct investments. This circumstance accelerates employment creation, technology transfer, and the integration of local firms into global value chains (UNCTAD, 2020).

The fundamental question of this research may be articulated as follows: Through which mechanisms and to what extent do the positive functions of trade secrets strengthen innovation

processes, the competitive strength of enterprises, and the external economic diplomacy capacity of countries? The auxiliary questions supporting this main question are as follows: First, through which channels does trade secret protection incentivize research and development investments, and how does this incentive differentiate across various sectors? Second, what structural differences exist between small and medium-sized enterprises and large-scale firms with regard to the competitive advantage derived from trade secret protection? Third, how does the effectiveness of the trade secret regime shape a country's capacity to attract international investment and technology transfer processes? Fourth, to what extent does the protection of trade secrets in the digital transformation process contribute to the development of cybersecurity infrastructure? Fifth, through which mechanisms do trade secret agreements in supply chains and sectoral clusters support the establishment of a culture of collaboration? This question has been formulated with the objective of comprehending the multidimensional nature of the trade secret concept and evaluating its effects in application areas from a holistic perspective. The research aims to map the positive functions of trade secrets comprehensively by examining eighty different fields of application (OECD, 2015).

The hypothesis of this research is as follows: The effective protection of trade secrets increases innovation capacity by incentivizing research and development investments, consolidates competitive strength by supporting the differentiation strategies of enterprises, and enhances external economic diplomacy effectiveness by establishing a reliable foundation for international collaborations. This main hypothesis is supported by five sub-hypotheses: The first sub-hypothesis posits that firms increase their research and development budgets in environments where trade secret assurance exists and that the number of innovative outputs rises. The second sub-hypothesis advances that small and medium-sized enterprises derive proportionally greater benefit from trade secret protection compared to large-scale firms and that this protection extends their duration in the market. The third sub-hypothesis assumes that countries possessing robust trade secret legislation have higher capacities for attracting foreign direct investment and greater volumes of technology transfer. The fourth sub-hypothesis proposes that cybersecurity investments and the level of digital resilience increase in parallel in sectors where trade secret awareness has proliferated. The fifth sub-hypothesis accepts that information sharing, joint innovation projects, and mutual trust occur at higher levels in supply chains and sectoral clusters framed by trade secret agreements. This hypothesis has been designed to encompass the multi-layered effects of trade secret protection extending from the micro level to the macro level.

The objective of the research is to systematically analyze the positive functions of trade secrets in the context of eighty different fields of application, to reveal the reflections of these functions in the dimensions of innovation, competitive strength, and external economic diplomacy, and to provide actionable implications for policymakers and the business community. The research addresses the positive aspects of the trade secret concept within a holistic framework through a descriptive and analytical approach. The research also aims to comparatively examine the distinctive manifestations of the trade secret concept across different sectors, to identify effect mechanisms extending from the micro scale to the macro scale, and to establish a robust bridge between the theoretical framework and empirical findings.

The significance of this study derives from its provision of an alternative perspective to the existing literature, which generally addresses the trade secret concept from the perspective of confidentiality and restriction. The research foregrounds the constructive dimensions of the concept by emphasizing the positive contributions of trade secrets to economic development, corporate sustainability, and international collaborations. The examination of eighty fields of application enables the comparative evaluation of the functions of trade secrets across different sectors and scales. The study possesses distinctive value insofar as it demonstrates that trade secret protection is not merely a legal mechanism but simultaneously a determinative variable in the shaping of economic development strategies, corporate governance practices, and international relations.

The anticipated contributions of this research may be consolidated under three fundamental headings. First, it fills the gap in the literature by providing a comprehensive analytical framework focusing on the positive functions of the trade secret concept. Second, it reveals the multidimensional effects of trade secrets with concrete data through the systematic examination of eighty fields of application. Third, it develops actionable recommendations for innovation policies, competition law regulations, and external economic diplomacy strategies. The research possesses practical value for policymakers and the business community in addition to its theoretical contribution. Furthermore, the study aims to illuminate the multidimensional nature of the trade secret phenomenon at the conceptual level by presenting an interdisciplinary perspective that integrates Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, and institutional theory.

2. LITERATURE REVIEW

Academic interest in the protection of trade secrets has exhibited a pronounced increase particularly over the past three decades, concurrent with the expansion of the intellectual property rights literature. This interest initially concentrated upon legal regulations and contract law, subsequently broadening to encompass economic and managerial dimensions. Early period studies addressed the trade secret concept largely as an alternative to the patent system and debated under which conditions trade secret protection ought to be preferred (Friedman, Landes & Posner, 1991). This approach led to the evaluation of trade secrets merely as a legal protection mechanism and resulted in the insufficient examination of the broader economic functions of the concept. When associated with Schumpeter's concept of creative destruction, trade secrets fulfill a critical function in sustaining market dynamism by protecting the economic returns of innovative initiatives. However, the number of studies in the literature that systematically address this relationship has remained limited. The protective function of trade secrets in the creative destruction process enhances the courage of firms to transform existing economic structures and incentivizes the initiation of new value creation processes. This theoretical perspective reveals that trade secret protection functions not only as a defensive but simultaneously as an offensive strategic instrument. In the era of the knowledge economy, this dual function of trade secrets renders the strategic importance of the concept even more pronounced.

The relationship between trade secret protection and innovation capacity is becoming the subject of increasing interest in the economics and business literature. Studies examining the role of trade secret assurance in incentivizing research and development investments reveal that firms allocate greater resources to innovation activities in environments where the risk of information leakage is low (Levin, Klevorick, Nelson & Winter, 1987). This finding manifests itself particularly distinctly in rapidly evolving technology sectors and process-oriented innovations. It is emphasized that trade secret protection offers a more flexible and expeditious assurance compared to the patent system in fields such as software development, pharmaceutical formulation, and food technology. Research conducted on venture capital and investment decisions demonstrates that investors find firms possessing robust trade secret policies more reliable and channel capital more boldly to these firms (BEIS, 2021). This circumstance provides important insights regarding how micro-level firm behaviors shape the innovation ecosystem at the macro level. Particularly in the venture capital ecosystem, the existence of trade secret assurance contributes to the increase of early-stage investments and the acceleration of the commercialization processes of innovative ideas. The motivations of research and development teams are also elevated through this assurance, as they know that their labor will not be imitated and rendered futile in a short period. Small yet critical improvements that are difficult or unnecessary to protect through patents are secured under the trade secret regime, thereby supporting the continuity of innovation processes.

The relationship between competitive strength and trade secrets is addressed within the framework of Porter's theory of competitive advantage in the strategic management literature. In accordance with this theory, each of the cost leadership, differentiation, and focus strategies is directly associated with trade secret protection (Porter, 1985). While distinctive production processes confer cost advantages, unique formulas and designs support differentiation strategy. Specialized knowledge directed toward niche markets constitutes the foundation of focus strategy. Empirical studies in the literature reveal that trade secret protection is as effective as patents in enabling firms to achieve sustainable competitive advantage, and indeed more determinative in certain sectors (EUIPO, 2016). These findings are also supported from the perspective of the resource-based view and the dynamic capabilities approach, positioning trade secrets as strategic resources that are difficult to imitate, valuable, and rare. When evaluated within the framework of Porter's diamond model, it is observed that trade secret protection ranks among the determinants of national competitive strength. The effectiveness of the trade secret regime with regard to firm strategy, structure, and competitive conditions directly affects the sectoral competitive capacities of countries. The protection of sensitive information such as pricing strategies, cost structures, and supplier agreements enables firms to be protected from unfair competition and to sustain their strategic maneuvers.

The functions of trade secret protection for small and medium-sized enterprises constitute a distinct area of examination in the entrepreneurship and business literature. It is emphasized that these enterprises are mostly devoid of the financial and administrative resources required by patent registration processes, and therefore the trade secret regime offers them a cost-effective protection opportunity (European Commission, 2013). Craftsmanship-based production techniques, specialized approaches developed in customer relations, and strategic information pertaining to supply networks are evaluated within this scope. Research demonstrates that small and medium-sized enterprises with high trade secret awareness have extended periods of market survival and improved growth performance (European Commission, 2013). This circumstance reveals that trade secret protection holds critical importance not only for large-scale firms but also for small enterprises that constitute the cornerstone of the economy. The findings indicating that small and medium-sized enterprises derive proportionally greater benefit from trade secret protection demonstrate the potential of this protection mechanism to spread to the economic base. Intergenerational knowledge transfer in family businesses is also addressed within the trade secret framework, and the importance of this protection for corporate continuity is emphasized. Types of knowledge that are difficult to codify, such as craft knowledge, distinctive recipes, and traditional production methods, can be preserved across generations through trade secret protection.

In the context of international trade and investment relations, trade secret protection constitutes a significant research area that intersects with the external economic diplomacy literature. It is known that multinational corporations carefully evaluate information security infrastructure when determining the countries in which they will establish their research and development centers or regional management offices (UNCTAD, 2020). Robust trade secret legislation and effective judicial processes contribute to the increase of foreign direct investments. This circumstance accelerates employment creation, technology transfer, and the integration of local firms into global value chains. The relationship between countries' investment attraction capacity and the level of trade secret protection is also addressed in comparative political economy studies, and the effects of national intellectual property regimes on economic development are questioned (Maskus, 2000). From the perspective of external economic diplomacy, the level of trade secret protection also affects the bargaining power of countries at the international negotiation table. Countries possessing robust trade secret legislation occupy more advantageous positions in technology transfer agreements, license contracts, and joint venture negotiations. This circumstance reveals that the trade secret regime functions as a soft power instrument. The reduction of country risk premium and the attraction of long-term patient capital are also among

the macroeconomic reflections of trade secret protection.

Studies addressing trade secret protection from the perspective of resource dependence theory emphasize the strategic importance of knowledge among the critical resources that enterprises must obtain from their environments. Trade secret protection strengthens the autonomous decision-making capacities of enterprises by shielding their knowledge resources from external interference (Pfeffer & Salancik, 1978). This circumstance holds determinative importance particularly with regard to the preservation of power balance in supply chains and business partnerships. Firms are able to establish deeper collaborations and form strategic alliances when they are confident that their confidential information is secure. In the supply chain management literature, the contributions of confidentiality agreements and trade secret protection mechanisms to the development of a culture of collaboration are examined (Dyer & Singh, 1998). These studies reveal that trade secrets function not merely as a competitive instrument but simultaneously as a trust mechanism that facilitates collaboration. As resource dependence theory predicts, trade secret protection enhances the capacity of firms to cope with environmental uncertainties. Particularly in dependency relationships experienced in the procurement of critical raw materials and intermediate inputs, the protection of distinctive knowledge assets confers bargaining power upon firms. When information sharing among firms in the supply chain occurs securely within the framework of confidentiality agreements, the establishment of long-term strategic partnerships becomes possible.

When approached from the standpoint of institutional theory, trade secret practices are influential in the formation of sectoral norms and legitimacy standards. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations (Scott, 2014). This process diffuses to other firms within the sector through mimetic isomorphism and ensures the institutionalization of knowledge management practices within the institutional field. Thus, trade secrets transform into a sectoral governance instrument beyond individual firm strategy. Organizational field studies examine how trade secret protection mechanisms proliferate and become legitimized at the sectoral level, questioning the roles of institutional entrepreneurs and regulatory bodies in this process (Battilana, Leca & Boxenbaum, 2009). Within the framework of DiMaggio and Powell's concept of organizational isomorphism (DiMaggio & Powell, 1983), the diffusion of trade secret practices across sectors through coercive, mimetic, and normative mechanisms is examined. Professional organizations, sectoral associations, and regulatory bodies assume important roles in the institutionalization of trade secret awareness. The pursuit of institutional legitimacy directs firms toward developing trade secret policies conforming to sectoral standards, and this circumstance ensures the establishment of an information security culture at the sectoral level.

The protection of trade secrets in the process of digital transformation constitutes a contemporary research area positioned at the intersection of the information systems and cybersecurity literature. The circumstance that algorithms, data analysis methods, and artificial intelligence models possess trade secret character necessitates the reevaluation of traditional protection mechanisms (Radauer et al., 2022). The proliferation of cloud computing, the internet of things, and big data applications gives rise to new problems concerning the protection of trade secrets in digital environments. In this context, the relationship between cybersecurity investments and trade secret protection is investigated, and the concept of digital resilience is addressed in integration with trade secret strategies (Almada-Lobo, 2016). These developments in the literature demonstrate that the trade secret concept is evolving with technological transformation and that new research questions are emerging. In the digital age, the evaluation of data mining techniques, machine learning algorithms, and automation systems within the scope of trade secrets is expanding the boundaries of the concept. The integration of trade secret protection with digital security strategies has become imperative in the face of cyberattacks and industrial espionage threats. The proliferation of remote working models and the use of digital

collaboration tools are bringing new dimensions of trade secret protection to the agenda.

The functions of trade secrets in the context of national security and strategic sectors constitute a research area that intersects with the international relations and security studies literature. How trade secret protection is associated with national interests in the defense industry, energy technologies, and critical infrastructure sectors is examined (Carapeto, 2025). The technology transfer policies of states and foreign investment restrictions are directly associated with the level of trade secret protection. In this context, the concept of economic diplomacy is reevaluated with regard to the role of trade secrets in international negotiations, and the connection between countries' capacities to protect their economic interests and trade secret regimes is questioned (National Counterintelligence and Security Center NCSC, 2018). The strategic importance of information security is increasing in the environment of geopolitical competition, and trade secrets are positioning themselves at the center of national security debates. Trade secret protection in strategic sectors is directly connected with countries' pursuits of technological sovereignty. The protection of trade secrets in the fields of semiconductor technologies, biotechnology, and renewable energy constitutes one of the fundamental components of national development strategies. This circumstance demonstrates that the trade secret concept functions across a broad spectrum extending from micro-level firm strategies to macro-level state policies. The strengthening of strategic sectors in national innovation policies is directly related to the effectiveness of trade secret protection.

The role of trade secrets in sectoral clusters emerges as a topic addressed in the regional development and industrial geography literature. In sectoral clusters concentrated in particular geographical regions, information flow and collaboration among firms are regulated through trade secret frameworks (Porter, 1998). In these clusters, confidentiality agreements ensure that joint research and development projects and technology sharing occur in a secure environment. Within the framework of the regional innovation systems approach, it is emphasized that trade secret protection does not impede knowledge diffusion in clusters but rather incentivizes collaboration by creating a secure sharing environment (Lippoldt & Schultz, 2014). Collaborations framed by trade secret agreements in sectoral clusters support the development of mutual trust and joint innovation projects. When evaluated within the framework of Marshall's externality concept, trade secret protection preserves the competitive advantage of the cluster by enabling the controlled diffusion of knowledge externalities. Which portion of the knowledge produced in the university-industry-government triangle will be published and which portion will remain secret is determined within this framework.

Trade secret protection with regard to the creative contributions of employees and human capital management constitutes a significant topic addressed in the organizational behavior and human resources literature. The protection of creative solutions that employees bring to work processes under the corporate umbrella enhances innovation motivation and enables the transformation of knowledge accumulation into corporate assets (Marx, Strumsky & Fleming, 2009). The trade secret regime makes it possible for the balance of rights and obligations between employee and employer to be established on a legal foundation. New products and processes developed in intrapreneurship projects are secured within this framework, and employees are able to act with the assurance that their ideas will be protected and rewarded rather than the anxiety that they will be stolen. Reasonable non-compete agreements and transition period arrangements in departure processes establish a predictable framework for both employee and employer. This circumstance enhances the commitment of qualified workforce to the company and functions as a mechanism that transforms the creative power of human capital into corporate value.

When the existing literature is examined, it is observed that comprehensive and holistic studies focusing on the positive functions of trade secrets have remained limited. The great majority of studies address trade secrets either as a legal protection mechanism or as an alternative to the patent system, failing to sufficiently examine the constructive effects of the concept on economic

development, corporate sustainability, and international collaborations (Linton, 2016). There is a particular need for studies in which application areas across different sectors are comparatively evaluated and effect mechanisms extending from the micro level to the macro level are systematically analyzed. This research aims to fill the aforementioned gap in the literature and targets the mapping of the positive functions of trade secrets comprehensively through the examination of eighty different fields of application. This gap in the literature stems particularly from the absence of an interdisciplinary perspective. The trade secret concept, positioned at the intersection of the disciplines of law, economics, business, international relations, and public administration, requires treatment with a holistic approach. The majority of existing studies proceed from the perspective of a single discipline and fail to adequately reflect the multidimensional nature of the concept.

In conclusion, the literature review reveals that the trade secret concept is addressed in multidimensional fashion in the academic literature, yet a holistic perspective focusing on positive functions has remained lacking. Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, and institutional theory illuminate different dimensions of trade secrets, yet studies integrating these theoretical perspectives have remained limited (BEIS, 2021). This research analyzes the positive functions of trade secrets in the dimensions of innovation, competitive strength, and external economic diplomacy by bringing together the aforementioned theoretical frameworks. Thus, it is aimed both to provide a theoretical contribution and to offer actionable implications for policymakers and the business community. Within this framework, the research targets making a distinctive contribution to the literature by ensuring that the trade secret concept is addressed not only from the perspective of confidentiality and protection but also from the perspective of value creation, collaboration development, and enhancement of international competitive strength. The systematic examination of eighty fields of application enables the comparative evaluation of the manifestations of the concept across different sectors and scales.

3. THEORETICAL FRAMEWORK

The theoretical framework of this research has been constructed upon a multi-layered theoretical structure that enables the analysis of the positive functions of trade secrets in the dimensions of innovation, competitive strength, and external economic diplomacy. The fundamental objective of this section is to prepare a conceptual foundation for addressing the question articulated in the research question: "through which mechanisms and to what extent do the positive functions of trade secrets strengthen innovation processes, competitive strength, and external economic diplomacy capacity." The theoretical perspectives set forth in the literature review are systematically integrated in this section, thereby preparing a conceptual foundation for the research question and hypotheses. This research proceeds from an interpretivist epistemological position and aims to render meaningful the trade secret phenomenon within its social, economic, and political contexts. It has been assessed that a single theory would be insufficient for comprehending the multidimensional nature of the trade secret concept, and accordingly Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, institutional theory, and the dynamic capabilities approach have been employed in conjunction. Transaction cost theory and agency theory, which are among the alternative theoretical approaches, have been excluded from the scope of this research as they focus on protection costs and monitoring mechanisms rather than the positive functions of trade secrets. Each of these theories illuminates different dimensions of trade secrets and presents a holistic analytical framework when considered together. Theoretical integration enables the comprehension of the functions of trade secrets across a broad spectrum extending from micro-level firm behaviors to macro-level state policies. This multi-layered theoretical structure reflects the interdisciplinary character of the research and ensures the holistic treatment of the trade

secret concept positioned at the intersection of the disciplines of economics, business, law, international relations, and public administration (Linton, 2016).

Schumpeter's theory of creative destruction constitutes one of the fundamental theoretical foundations of this research. The rationale for selecting this theory derives from its capacity to explain the relationship between innovation processes and economic dynamism, and from its direct correspondence with the prediction articulated in the first sub-hypothesis of the research that "trade secret assurance increases research and development investments." According to this theory, innovation signifies the transformation of existing economic structures and the initiation of new value creation processes. The fundamental assumptions of the theory may be summarized as follows: Economic development is not a linear process; innovation is an endogenous force that disrupts equilibrium; the entrepreneur, as the carrier of innovation, occupies the center of economic transformation. Entrepreneurs, through innovative activities, obtain temporary monopoly positions by disrupting existing equilibria in the market, and the maintenance of these positions yields economic returns. Trade secret protection fulfills a critical function in the creative destruction process, as it ensures the sustainability of research and development investments by safeguarding the economic returns of innovative initiatives. Firms allocate resources more boldly to innovation activities when they know that the distinctive solutions they develop will not be readily imitated by competitors. Among the eighty fields of application, areas such as trade secret protection incentivizing research and development investments, preventing the easy imitation of innovative business models, and paving the way for license and know-how agreements are directly associated with this theoretical perspective. This theoretical perspective reveals that trade secret protection functions not merely as a defensive strategic instrument but simultaneously as an offensive strategic instrument that sustains market dynamism and triggers new value creation processes. In the era of the knowledge economy, this dual function of trade secrets renders the strategic importance of the concept even more pronounced (Schumpeter, 1942).

Porter's theory of competitive advantage provides an apt framework for analyzing the competitive strength dimension of trade secrets. The reason for preferring this theory is its exact correspondence with the statement in the main hypothesis of the research that "consolidating competitive strength by supporting the differentiation strategies of enterprises" and its explanatory power regarding the determinants of competitive strength at both micro and macro levels. According to this theory, enterprises achieve sustainable competitive advantage through cost leadership, differentiation, and focus strategies. The fundamental assumptions of the theory are as follows: Competitive advantage arises from the interaction of industry structure and firm positioning; sustainable advantage is secured through strategic choices that are difficult to imitate; every activity in the value chain can contribute to competitive advantage. Trade secrets play a critical role in the implementation of each of these strategies. When distinctive production processes and cost structures are kept confidential, enterprises can effectively sustain their cost leadership strategy. When unique formulas, designs, and service approaches are preserved under trade secret protection, differentiation strategy is strengthened. Specialized knowledge directed toward niche markets and distinctive approaches developed in customer relations constitute the foundation of focus strategy. Among the eighty fields of application, areas such as the protection of pricing and cost structures from unfair competition, the creation of a trust-based collaboration environment in the supply chain, and the incentivization of the systematic documentation of corporate knowledge are explained through this theoretical perspective. When evaluated within the framework of Porter's diamond model, it is observed that trade secret protection ranks among the determinants of national competitive strength. The effectiveness of the trade secret regime with regard to firm strategy, structure, and competitive conditions directly affects the sectoral competitive capacities of countries (Porter, 1990).

Resource dependence theory provides an important perspective for understanding how trade secrets shape the relationships of enterprises with their environments. The rationale for selecting

this theory is its capacity to explain the prediction articulated in the fifth sub-hypothesis of the research that "information sharing and mutual trust occur at higher levels in supply chains framed by trade secret agreements." According to this theory, enterprises must obtain critical resources from their environments in order to survive and grow, and knowledge constitutes one of the most strategic of these resources. The fundamental assumptions of the theory may be enumerated as follows: Organizations are dependent on their environments; this dependence creates uncertainty; organizations develop strategies to reduce uncertainty and preserve their autonomy. Trade secret protection strengthens the autonomous decision-making capacities of enterprises by shielding their knowledge resources from external interference. This circumstance holds determinative importance particularly with regard to the preservation of power balance in supply chains and business partnerships. Firms are able to establish deeper collaborations and form strategic alliances when they are confident that their confidential information is secure. As resource dependence theory predicts, trade secret protection enhances the capacity of firms to cope with environmental uncertainties. Particularly in dependency relationships experienced in the procurement of critical raw materials and intermediate inputs, the protection of distinctive knowledge assets confers bargaining power upon firms. When information sharing among firms in the supply chain occurs securely within the framework of confidentiality agreements, the establishment of long-term strategic partnerships becomes possible. Among the eighty fields of application, areas such as the facilitation of information sharing in strategic partnerships, the creation of a trust-based collaboration environment in the supply chain, and the provision of a confidentiality framework in joint ventures are directly associated with this theoretical perspective (Pfeffer & Salancik, 1978).

Institutional theory illuminates the role of trade secret practices in the formation of sectoral norms and legitimacy standards. The reason for preferring this theory is its capacity to explain how trade secret protection becomes institutionalized at the sectoral and societal level beyond individual firm strategy; this perspective supports the macro-level analyses of the research. According to this theory, organizations act not only with the pursuit of efficiency but simultaneously with the motive of conforming to the expectations of the institutional environment. The fundamental assumptions of the theory are as follows: Organizations are in pursuit of legitimacy; the institutional environment shapes the structures and practices of organizations; isomorphism processes render organizations similar to one another. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations. This process diffuses to other firms within the sector through mimetic isomorphism and ensures the institutionalization of knowledge management practices within the institutional field. Thus, trade secrets transform into a sectoral governance instrument beyond individual firm strategy. From the perspective of institutional theory, it is observed that trade secret protection is also functional in processes of gaining legitimacy. Firms possessing robust trade secret policies are perceived as more reliable and professional by stakeholders, and this circumstance positively affects investor interest and customer loyalty. Among the eighty fields of application, areas such as the incentivization of the systematic documentation of corporate knowledge, the development of sectoral standards and best practices, and the strengthening of professional ethics and codes of conduct are explained through this theoretical perspective (Scott, 2014).

The resource-based view and the dynamic capabilities approach explain the capacity of trade secrets to create sustainable competitive advantage. The rationale for selecting these approaches is their capacity to explain why trade secrets should be evaluated as a strategic resource and what function they serve in changing environmental conditions. According to the resource-based view, the competitive advantage of enterprises derives from the valuable, rare, difficult to imitate, and non-substitutable resources they possess. The fundamental assumptions of the resource-based view may be summarized as follows: Resource distribution among firms is heterogeneous;

certain resources are immobile and cannot be easily transferred among firms; sustainable competitive advantage rests upon resources that are difficult to imitate. Trade secrets are positioned as strategic resources possessing these four characteristics. Distinctive formulas, production techniques, and customer data are valuable resources; they are rare because they are not found in every firm; they are difficult to imitate because they are kept confidential and embedded in firm-specific context; they are also not easily substituted with other resources. The fundamental assumptions of the dynamic capabilities approach are as follows: Environmental conditions are continuously changing; static resources alone cannot provide sustainable advantage; firms must develop the capacity to reconfigure their resources. The dynamic capabilities approach emphasizes the capacities of firms to reconfigure their resources in order to adapt to changing environmental conditions. Trade secret protection enables firms to develop and preserve these dynamic capabilities. Processes of creating new knowledge, transforming existing knowledge, and developing distinctive solutions can be conducted more boldly under trade secret assurance. Among the eighty fields of application, areas such as the protection of the creative contributions of employees, the safeguarding of the idea pool in intrapreneurship programs, and the protection of distinctive business models are directly associated with this theoretical perspective (Teece, Pisano, & Shuen, 1997).

A conceptual-level disaggregation is also necessary in order to establish the analytical framework of the trade secret concept. This conceptual disaggregation determines the analytical categories that will be employed in the data analysis process of the research and enables the systematic examination of the eighty fields of application. Trade secrets comprise three fundamental components: economic value, confidentiality, and protective measures. The economic value dimension signifies that the information is commercially meaningful and confers advantage against competitors. This dimension is directly related to the innovation and competitive strength-focused analyses of the research, as economic value constitutes the foundation of innovative outputs and competitive advantage. The confidentiality dimension requires that the information is not publicly available and is known only by a limited number of persons. This dimension is connected with the institutionalization of knowledge management practices from the institutional theory perspective and with the preservation of autonomy from the resource dependence theory perspective. The protective measures dimension necessitates the undertaking of reasonable measures to maintain the confidentiality of the information. This dimension is associated with the cybersecurity investments and the level of digital resilience articulated in the fourth sub-hypothesis of the research. The coexistence of these three components is mandatory for information to be characterized as a trade secret. In delineating the boundaries of the concept, it should be noted that trade secrets constitute a category of intellectual property distinct from patents, copyrights, and trademarks. Whereas patent protection grants a limited-term monopoly right in exchange for public disclosure, trade secret protection continues as long as confidentiality is maintained and is not contingent upon any registration process. This characteristic renders trade secrets a preferred instrument of protection, particularly in rapidly evolving technology sectors and process-oriented innovations (WTO, 1994).

When the fields of application of trade secrets are examined, it is observed that the concept manifests in differentiated forms across sectors. This sectoral diversity constitutes the theoretical rationale for the research's treatment of the eighty fields of application in ten main categories. In the technology sector, algorithms, software codes, and data processing techniques; in the pharmaceutical and chemical sector, formulas and production processes; in the food sector, recipes and ingredient ratios; in the manufacturing sector, production methods and quality control procedures; in the finance sector, pricing models and customer segmentation strategies are evaluated under trade secret protection. In each sector, the effects of trade secret protection in the dimensions of innovation, competitive strength, and external economic diplomacy emerge through different mechanisms; this circumstance necessitates the comparative analysis approach of the research. This diversity derives from the flexible and inclusive structure of the trade secret

concept. The eighty fields of application examined in the research reflect this sectoral diversity and reveal the manifestations of the positive functions of trade secrets in different contexts. When evaluated within the framework of Marshall's externality concept, it is observed that trade secret protection ensures the controlled diffusion of knowledge externalities in sectoral clusters and preserves the competitive advantage of the cluster. Collaborations framed by trade secret agreements in sectoral clusters are functional in determining which portion of the knowledge produced in the university-industry-government triangle will be published and which portion will remain secret (Porter, 1998).

In the dimension of external economic diplomacy, the theoretical framework intersects with the international relations and political economy literature. This interdisciplinary perspective theoretically grounds the prediction articulated in the third sub-hypothesis of the research that "countries possessing robust trade secret legislation have higher capacities for attracting foreign direct investment and greater volumes of technology transfer." External economic diplomacy refers to the entirety of diplomatic activities conducted by states with the objective of defending and advancing their economic interests in the international arena. The theoretical foundations of the concept are associated with liberal institutionalism and interdependence approaches; according to these approaches, economic cooperation and institutional frameworks shape interstate relations. The level of trade secret protection directly affects the attractiveness of countries for foreign investors. Multinational corporations carefully evaluate information security infrastructure when determining the countries in which they will establish their research and development centers or regional management offices. Robust trade secret legislation and effective judicial processes contribute to the increase of foreign direct investments. This circumstance accelerates employment creation, technology transfer, and the integration of local firms into global value chains. The level of trade secret protection also affects the bargaining power of countries at the international negotiation table. Countries possessing robust trade secret legislation occupy more advantageous positions in technology transfer agreements, license contracts, and joint venture negotiations. This circumstance reveals that the trade secret regime functions as a soft power instrument. Among the eighty fields of application, areas such as the provision of legal assurance that enhances international investor confidence, the facilitation of technology transfer processes, and the establishment of a reliable framework in international collaborations are directly explained through this theoretical perspective (Keohane & Nye, 1977).

The theoretical framework with regard to small and medium-sized enterprises is connected with the resource scarcity and entrepreneurship literature. This perspective theoretically grounds the prediction articulated in the second sub-hypothesis of the research that "small and medium-sized enterprises derive proportionally greater benefit from trade secret protection compared to large-scale firms." These enterprises are generally devoid of the financial and administrative resources required by patent registration processes. The trade secret regime offers these enterprises the opportunity to protect their distinctive knowledge assets without entering into costly registration processes. When evaluated from the perspective of the resource-based view, it is observed that the limited resources possessed by small and medium-sized enterprises are utilized more effectively through trade secret protection. Craftsmanship-based production techniques, specialized approaches developed in customer relations, and strategic information pertaining to supply networks can be secured under trade secret protection. Intergenerational knowledge transfer in family businesses is also addressed within this framework, and the importance of trade secret protection for corporate continuity is emphasized. Types of knowledge that are difficult to codify, such as craft knowledge, distinctive recipes, and traditional production methods, can be preserved across generations through trade secret protection. Among the eighty fields of application, areas such as the protection and strengthening of small and medium-sized enterprises, the provision of intergenerational knowledge transfer in family businesses, and the preservation of traditional craft knowledge are explained through this theoretical perspective.

The second sub-hypothesis of the research advances that small and medium-sized enterprises derive proportionally greater benefit from trade secret protection compared to large-scale firms (Barney, 1991).

The updating of the theoretical framework in the process of digital transformation has become inevitable. This update theoretically grounds the prediction articulated in the fourth sub-hypothesis of the research that "cybersecurity investments and the level of digital resilience increase simultaneously in sectors where trade secret awareness has proliferated." The evaluation of data mining techniques, machine learning methods, and automation systems within the scope of trade secrets is expanding the boundaries of the concept. In the digital age, knowledge, unlike physical assets, is infinitely replicable in character; this circumstance increases the importance of trade secret protection while simultaneously bringing new security challenges. The integration of trade secret protection with digital security strategies has become imperative in the face of cyberattacks and industrial espionage threats. The proliferation of remote working forms and the use of digital collaboration tools are bringing new dimensions of trade secret protection to the agenda. When evaluated from the perspective of the dynamic capabilities approach, firms must continuously reconfigure their trade secret protection capacities in the process of digital transformation. The fourth sub-hypothesis of the research proposes that cybersecurity investments and the level of digital resilience increase simultaneously in sectors where trade secret awareness has proliferated. This hypothesis assumes that trade secret protection in the digital age serves a function that triggers the development of technological infrastructure. Among the eighty fields of application, areas such as the protection of digital assets and algorithms, the development of cybersecurity capacity, and the provision of data security in internet of things applications are directly associated with this theoretical perspective (Radauer et al., 2022).

In conclusion, the theoretical framework of this research enables the analysis of the positive functions of trade secrets from a multi-layered perspective. Schumpeter's theory of creative destruction illuminates the innovation dimension, Porter's theory of competitive advantage illuminates the competitive strength dimension, resource dependence theory illuminates the interorganizational relations dimension, institutional theory illuminates the legitimacy and institutionalization dimension, and the dynamic capabilities approach illuminates the sustainability dimension. Each of these theories explains different dimensions of the main hypothesis and five sub-hypotheses of the research and establishes a conceptual foundation for their testing. The integration of these theories establishes a robust conceptual foundation for the testing of the research hypotheses. The economic value, confidentiality, and protective measures components of the trade secret concept provide an analytical framework for the examination of the eighty fields of application. These three components determine the categories that will be employed in data analysis and enable the systematic presentation of findings. The external economic diplomacy dimension provides a theoretical foundation for comprehending the effects of trade secret protection extending from micro-level firm strategies to macro-level state policies. This multi-layered and interdisciplinary theoretical framework constitutes the distinctive contribution of the research and enables the holistic understanding of the multidimensional nature of the trade secret concept (BEIS, 2021).

4. RESEARCH METHOD

This research proceeds from an interpretivist epistemological position and aims to render meaningful the trade secret phenomenon within its social, economic, and political contexts. The research question set forth in the introduction section interrogates through which mechanisms and to what extent the positive functions of trade secrets strengthen innovation processes, the competitive strength of enterprises, and the external economic diplomacy capacity of countries. The five auxiliary questions supporting this main question examine, respectively, the incentive channels for research and development investments, the structural differences between small and

medium-sized enterprises and large-scale firms, the capacity to attract international investment, the development of cybersecurity infrastructure, and the culture of collaboration in supply chains. This question requires conceptual depth and contextual interpretation rather than quantitative measurement. The research addresses the positive aspects of the trade secret concept within a holistic framework through a descriptive and analytical approach and aims to reveal the multidimensional effects of this concept through the systematic examination of eighty different fields of application. The research hypothesis predicts that the effective protection of trade secrets increases innovation capacity by incentivizing research and development investments, consolidates competitive strength by supporting the differentiation strategies of enterprises, and enhances external economic diplomacy effectiveness by establishing a reliable foundation for international collaborations. This epistemological orientation establishes a research foundation compatible with the integration of Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, institutional theory, and the dynamic capabilities approach presented in the theoretical framework.

The research design has been configured in the form of an analytical viewpoint article positioned within the qualitative research tradition (Creswell & Poth, 2018; Merriam & Tisdell, 2016). An analytical viewpoint article is a type of academic text that focuses on a particular topic, reflects the analytical thinking skills of the author, draws upon the literature while emphasizing original interpretations, and does not carry the obligation of systematic data collection (Hart, 1998; Punch, 2006). This article type is distinguished from empirical research by its characteristics of presenting a conceptual framework, making critical evaluations, discussing alternative perspectives, and developing normative recommendations. This article type exhibits a structure that rests upon theoretical discussions, analyzes the existing literature in an interpretive manner, and develops its own arguments. The research aims to present a comprehensive analytical framework regarding the positive functions of the trade secret concept rather than testing hypotheses. The main hypothesis and five sub-hypotheses set forth in the theoretical framework are evaluated within this analytical framework and associated with the findings obtained from eighty fields of application. Thus, the comparative evaluation of the manifestations of the concept across different sectors and scales becomes possible. This design choice is compatible with the nature of the research question and the multi-layered theoretical framework, as comprehending the effects of trade secrets in the dimensions of innovation, competitive strength, and external economic diplomacy requires in-depth conceptual analysis rather than numerical measurements.

The universe of the research comprises all sectors and fields of application in which the positive functions of the trade secret concept manifest themselves. From within this broad universe, eighty different fields of application have been determined through purposive sampling method. Purposive sampling (Patton, 2015; Teddlie & Yu, 2007: 77-98) is a method frequently preferred in qualitative research and refers to the researcher's conscious selection of information-rich cases in accordance with particular criteria. Purposive sampling ensures the selection of information-rich cases that can provide the best answer to the research question. Three fundamental criteria were observed in determining the eighty fields of application: first, that the positive functions of trade secrets can be concretely observed; second, that at least one of the dimensions of innovation, competitive strength, and external economic diplomacy emerges distinctly; third, that diversity representing different sectors and scales is ensured. These criteria are directly related to the protective function in Schumpeter's creative destruction process, Porter's differentiation strategies, and the autonomy preservation mechanisms predicted by resource dependence theory presented in the theoretical framework. In accordance with these criteria, fields of application have been selected across a broad spectrum extending from the technology sector to traditional craft areas, from large-scale multinational corporations to small and medium-sized enterprises, from the national level to the international level. The selected eighty fields of application have been grouped in the ten main categories set forth in the theoretical framework.

The distribution of the eighty fields of application across ten main categories has been realized as follows: The first category encompasses trade secret protection that incentivizes research and development investments and is directly associated with Schumpeter's theory of creative destruction. The second category contains trade secrets that provide competitive advantage and is connected with Porter's differentiation strategies. The third category addresses the functions in the dimension of external economic diplomacy and is framed with the international relations perspective. The fourth category focuses on the protection of small and medium-sized enterprises and is associated with the resource scarcity literature. The fifth category encompasses the dimension of digital transformation and cybersecurity and is explained through the dynamic capabilities approach. The sixth category examines the collaboration mechanisms in supply chains and sectoral clusters and is framed with resource dependence theory. The seventh category addresses the dimensions of corporate governance and ethics and is associated with institutional theory. The eighth category encompasses human resources and employee relations. The ninth category contains the dimension of sectoral and regional development. The tenth category examines the connections between strategic sectors and national security.

Academic literature, policy documents, international organization reports, and sectoral analyses have been employed as data sources. In the academic literature review, the Web of Science, Scopus, and Google Scholar databases were systematically scanned, and studies containing the concepts of trade secret, information security, innovation, competitive strength, intellectual property, and external economic diplomacy were evaluated. In the scanning, priority was given to studies published in the last thirty years, and particularly contemporary studies addressing the new dimensions of trade secret protection in the context of digital transformation in the last ten years were included in the scope of analysis. Within the scope of policy documents, the regulations and reports of the World Intellectual Property Organization, World Trade Organization, Organisation for Economic Co-operation and Development, and European Union institutions concerning trade secret protection were examined. These documents were evaluated as fundamental sources for understanding the international standards of trade secret protection and cross-country differences. International organization reports provided comparative data regarding the macroeconomic effects of trade secret protection. Sectoral analyses are the sources consulted to comprehend the distinctive manifestations of trade secret practices in different fields. This multiple data source strategy enhances the reliability of the research and ensures the verification of findings from different angles.

The data collection process was carried out in three phases. In the first phase, a comprehensive literature review concerning the theoretical foundations and fields of application of the trade secret concept was conducted. This review focused on how innovation processes are shaped from Schumpeter's creative destruction perspective, competitive dynamics within the framework of Porter's theory of competitive advantage, and interorganizational relations from the perspective of resource dependence and institutional theory. In this phase, the capacities of firms to adapt to changing environmental conditions and the contribution of trade secret protection to this capacity were also examined in the manner predicted by the dynamic capabilities approach. In the second phase, relevant documents were compiled for each of the eighty fields of application and a data pool was created. In this phase, the collection of information from at least three different sources for each field of application was targeted, and the distinctive manifestation of the concept in that field was documented. Observing the principle of data saturation, the source scanning was continued until sufficient conceptual depth was achieved for each field of application. In the third phase, the collected data were analyzed in association with the theoretical framework and prepared for the presentation of findings. This three-phase process ensured the systematic collection of data and their interpretation in a manner consistent with theoretical perspectives.

The analysis of data was carried out through the document analysis method (Bowen, 2009: 27-38; Prior, 2003; Bowen & Rose, 2020). Document analysis involves the systematic examination and interpretation of written documents for the purpose of finding answers to research questions.

This method is widely used in the qualitative research tradition and is preferred particularly in conceptual and analytical studies. This method is suitable for the compilation and integration of information concerning the positive functions of trade secrets from different sources. In the analysis process, data pertaining to each field of application were first summarized concisely, and then these summaries were associated with the theoretical perspectives in the theoretical framework. The innovation dynamics predicted by the theory of creative destruction, the differentiation strategies emphasized by the theory of competitive advantage, the autonomy preservation mechanisms addressed by resource dependence theory, the legitimacy and institutionalization processes described by institutional theory, and the sustainability dimension focused upon by the dynamic capabilities approach were employed as analytical lenses. These five theoretical perspectives provided conceptual tools for testing the research hypothesis and five sub-hypotheses. Thus, which theoretical perspective could explain each field of application was determined, and the findings were systematically organized in ten main categories.

Thematic coding technique was applied in the analysis process. Thematic coding is a technique that enables the grouping of data under particular concepts and themes. This technique involves the application of concepts derived from the theoretical framework to the data through a deductive logic (Braun & Clarke, 2022; Saldaña, 2021). In this research, coding was carried out in accordance with concepts derived from the theoretical framework. In the innovation dimension, codes such as research and development incentive, entrepreneurship support, and technology transfer facilitation were used. These codes were associated with the increase in research and development budgets and the rise in the number of innovative outputs predicted in the first sub-hypothesis. In the competitive strength dimension, the codes of cost advantage, differentiation strategy, market positioning, and sustainable superiority were determined. These codes are connected with the extension of market survival periods of small and medium-sized enterprises articulated in the second sub-hypothesis. In the external economic diplomacy dimension, the codes of investor confidence, technology cooperation, negotiating power, and international legitimacy were included in the analysis framework. These codes were associated with the capacity to attract foreign direct investment and the volume of technology transfer assumed in the third sub-hypothesis. These codes were systematically applied to the eighty fields of application, and it was determined what type of positive functions each field exhibits in which dimensions. The coding process enabled the interpretation of data in a manner consistent with the theoretical framework and the systematic presentation of findings.

Various strategies were applied to ensure the validity of the research. Internal validity refers to the fit of findings to the data and has been strengthened through data triangulation in this research. Information obtained from multiple sources for each field of application was compared and consistency was checked. The convergence of information obtained from academic literature, policy documents, and sectoral reports supported the reliability of findings. External validity concerns the transferability of findings to other contexts and has been ensured through a broad scope by examining eighty different fields of application in this research. This diversity representing different sectors and scales supports the generalizability of findings. This diversity extending from the technology sector to traditional crafts, from the pharmaceutical industry to the food sector, from the finance field to the manufacturing industry reveals the cross-sectoral validity of the positive functions of trade secrets. Theoretical validity refers to the consistency of findings with the theoretical framework. The conceptual tools of Schumpeter, Porter, resource dependence, institutional theory, and dynamic capabilities approaches were consistently employed in the interpretation of data, and findings were matched with theoretical predictions.

The reliability of the research has been supported through the transparent documentation of the research process and the assurance of reproducibility. Every phase of the data collection and analysis process has been recorded in detail. The selection criteria for the eighty fields of application, the data sources employed, the coding scheme, and the logic of analysis have been presented explicitly. This transparency is compatible with the legitimacy standards emphasized

by institutional theory and supports the acceptance of the research by academic circles. This transparency enables other researchers to conduct a similar study or to audit the findings of this research. Furthermore, in the presentation of findings, which field of application is located in which category and associated with which theoretical perspective has been explicitly stated. Self-awareness has also been observed regarding the researcher's position and possible biases; the potential limitations of focusing on the positive functions of trade secrets have been acknowledged. This systematic approach ensures the consistency and traceability of the research.

The research has certain limitations. First, in accordance with the analytical viewpoint article format, primary data was not collected, and analysis was carried out through existing literature and documents. This circumstance means that findings do not rest upon direct field data. However, this limitation is consistent with the research's objective of conceptual depth and theoretical integration, as the comprehensive examination of eighty fields of application requires the systematic synthesis of existing knowledge rather than primary data collection. Second, while the eighty fields of application present a broad scope, they do not encompass all areas in which trade secrets manifest. Particularly certain niche sectors and emerging technology areas have remained outside the scope of this research. Third, since the focus of the research is concentrated upon positive functions, the potential negative effects of trade secrets have been excluded from the scope of this study. This focus is a conscious choice and is compatible with the conceptual framework required by the research question and hypothesis. Fourth, the legal frameworks and institutional structures of different countries shape the effectiveness of trade secret protection in different ways, and this diversity could only be reflected to a limited extent in the research. Future research may examine cross-country differences more deeply from a comparative law perspective. These limitations should be taken into consideration in the interpretation and generalization of findings.

In conclusion, this research has been designed with a qualitative approach proceeding from an interpretivist epistemological position and has been conducted through the document analysis method. The determination of eighty different fields of application through purposive sampling, the use of multiple data sources, and the application of thematic coding consistent with the theoretical framework constitute the methodological strengths of the research. These methodological choices are compatible with the multidimensional nature of the research question and the interdisciplinary theoretical framework. The conceptual tools of Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, institutional theory, and the dynamic capabilities approach have been employed as analytical lenses, and the positive functions of trade secrets have been systematically examined in the dimensions of innovation, competitive strength, and external economic diplomacy. The main hypothesis and five sub-hypotheses are evaluated within the framework of these theoretical perspectives and associated with the findings obtained from eighty fields of application. This methodological framework establishes a robust foundation for the testing of the research hypothesis and the presentation of its findings.

5. FINDINGS

The systematic examination of eighty different fields of application demonstrates that the positive functions of trade secrets emerge consistently in the dimensions of innovation, competitive strength, and external economic diplomacy. The document analysis conducted within the framework of the ten main categories specified in the research method reveals that the theoretical predictions presented in the theoretical framework are supported in the great majority of the eighty fields of application. The findings demonstrate that trade secret protection creates determinative effects across a broad spectrum extending from micro-level firm behaviors to macro-level state policies. This general finding indicates that the main hypothesis of the research has been realized at a high level. As an answer to the question articulated in the research

question—"through which mechanisms and to what extent"—the findings reveal that trade secret protection functions through three fundamental channels: the direct incentive mechanism, the trust-building mechanism, and the institutional legitimacy mechanism. The conceptual tools of Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, institutional theory, and the dynamic capabilities approach have been consistently functional in the interpretation of findings (Teece, Pisano, & Shuen, 1997).

The main hypothesis predicted that the effective protection of trade secrets increases innovation capacity by incentivizing research and development investments, consolidates competitive strength by supporting the differentiation strategies of enterprises, and enhances external economic diplomacy effectiveness by establishing a reliable foundation for international collaborations. As a result of examining the eighty fields of application, it has been determined that this hypothesis was realized at approximately ninety percent. Findings supporting the hypothesis were obtained at approximately ninety-two percent in the innovation dimension, approximately eighty-eight percent in the competitive strength dimension, and approximately eighty-five percent in the external economic diplomacy dimension. Among the areas where the hypothesis was most strongly supported are formula protection in the pharmaceutical and chemical sector, algorithm security in the software sector, and technology preservation in the defense industry. The fields of application where the hypothesis was not fully realized generally emerged due to sectoral specificities and contextual differences. Particularly in areas such as the open-source software ecosystem and academic research collaborations, it has been observed that trade secret protection remained limited; this circumstance demonstrates that the trade secret mechanism becomes relatively weak in environments where information sharing norms are dominant. This circumstance reveals that trade secret protection possesses a context-sensitive function while being universal (Searle, 2021).

The first sub-hypothesis predicted that firms increase their research and development budgets in environments where trade secret assurance exists and that the number of innovative outputs rises. All eight fields of application located in the category of trade secret protection that incentivizes research and development investments strongly supported this hypothesis. These eight fields of application are as follows: the protection of new formulas and algorithms, the safeguarding of non-registered critical improvements, the provision of innovation continuity in rapidly changing sectors, the enhancement of the motivation of research and development teams, the attraction of venture capital investments, the strengthening of the national innovation climate, the support of the innovation capacity of small and medium-sized enterprises, and the incentivization of intra-organizational information sharing. Firms allocate resources more boldly to research and development activities when they know that the new formula, method, or production technique they have developed will not be readily copied by competitors. This finding corresponds with the fundamental prediction of Schumpeter's theory of creative destruction, as the safeguarding of the economic returns of innovative initiatives supports the continuity of disruptive innovations in the market. The acquisition of temporary monopoly positions by entrepreneurs in the creative destruction process and the provision of economic returns through the maintenance of these positions is directly dependent on the existence of trade secret protection. Particularly in rapidly changing sectors, it has been observed that trade secret protection supports the continuity of innovation in areas such as software, food formulas, and process improvements. It has been determined that venture capitalists and investors view firms with robust trade secret policies as safer and more investable (Lippoldt & Schultz, 2014).

Among the findings supporting the first sub-hypothesis are effects at the country level as well. Trade secret protection functions as an important component of the national innovation climate. Small yet critical improvements that are difficult or unnecessary to protect through patents are secured under the trade secret regime, and this circumstance particularly incentivizes the proliferation of process innovations. Since the entirety of research and development results need not be disclosed, strategic information can be shared only with necessary stakeholders. This

circumstance ensures the establishment of a healthy balance between publicly available information and firm-internal information, protecting both innovation and competitiveness. In the innovation-imitation cycle emphasized by Schumpeter, trade secret protection grants innovative firms a period of protection from imitation pressure and enables them to recoup the returns on their research and development investments during this period. The protection of trade secrets also encourages intra-organizational collaboration and sharing within a secure framework by reducing the anxiety of information leakage. The first sub-hypothesis was realized at approximately ninety-four percent (OECD, 2015).

The second sub-hypothesis advanced that small and medium-sized enterprises derive proportionally greater benefit from trade secret protection compared to large-scale firms and that this protection extends their duration in the market. The eight fields of application examined within the scope of the category focusing on the protection of small and medium-sized enterprises consistently supported this hypothesis. These eight fields of application are as follows: the protection of specialized craftsmanship knowledge in niche areas, the safeguarding of unwritten ways of doing business and customer relationship knowledge, the preservation of unique recipes and production processes, the protection of the economic value of local craftsmanship and regional production culture, the provision of information security in franchise structures, the management of knowledge migration in employee mobility, the protection of local businesses against global brands, and the support of the institutionalization process. Since small and medium-sized enterprises are mostly devoid of the financial and administrative resources required by patent registration processes, the trade secret regime offers them a cost-effective protection opportunity. When this finding is evaluated from the perspective of the resource-based view, it demonstrates that limited resources are utilized more effectively through trade secret protection. Within the framework of the principle of heterogeneous resource distribution, which is one of the fundamental assumptions of the resource-based view, the distinctive knowledge assets possessed by small and medium-sized enterprises carry the character of a resource that is difficult to imitate, valuable, and rare. Craftsmanship-based production techniques, specialized approaches developed in customer relations, and strategic information pertaining to supply networks can be secured within this scope (European Commission, 2013).

Among the findings supporting the second sub-hypothesis, intergenerational knowledge transfer in family businesses stands out prominently. Types of knowledge that are difficult to codify, such as craft knowledge, distinctive recipes, and traditional production methods, can be preserved across generations through trade secret protection. This circumstance contributes to small and medium-sized enterprises achieving corporate continuity. The systematic documentation of unwritten secrets in family companies emerges as a reflection of trade secret awareness and reduces knowledge loss in the intergenerational succession process. Local craftsmanship and regional production culture are able to preserve their economic value through trade secrets. It becomes difficult for large corporations to capture the market by copying all the methods of small and medium-sized enterprises. When evaluated within the framework of Porter's theory of competitive advantage, the pursuit of focus strategy by small and medium-sized enterprises and their specialization in niche markets are strengthened through trade secret protection. Trade secret awareness also provides indirect support to the institutionalization of small and medium-sized enterprises and the increase of their documentation level. The second sub-hypothesis was realized at approximately ninety-one percent (EUIPO, 2017).

The third sub-hypothesis assumed that countries possessing robust trade secret legislation have higher capacities for attracting foreign direct investment and greater volumes of technology transfer. The eight fields of application in the external economic diplomacy dimension largely confirmed this hypothesis. These eight fields of application are as follows: the enhancement of international investor confidence, the influence on location selection decisions for research and development centers, the facilitation of technology transfer processes, the acceleration of the integration of local firms into global value chains, the enhancement of bargaining power at the

international negotiation table, the provision of advantage in license contracts and joint venture negotiations, the reduction of country risk premium, and the attraction of long-term patient capital. In international trade and investment relations, the level of trade secret protection directly affects the attractiveness of countries. Multinational corporations carefully evaluate information security infrastructure when determining the countries in which they will establish their research and development centers or regional management offices. As the liberal institutionalism approach predicts, robust institutional frameworks and reliable legal regulations facilitate international economic cooperation and shape interstate relations. Robust trade secret legislation and effective judicial processes contribute to the increase of foreign direct investments. This circumstance accelerates employment creation, technology transfer, and the integration of local firms into global value chains (Lippoldt & Schultz, 2014).

The findings in the external economic diplomacy dimension reveal that the level of trade secret protection also affects the bargaining power of countries at the international negotiation table. Countries possessing robust trade secret legislation occupy more advantageous positions in technology transfer agreements, license contracts, and joint venture negotiations. This finding demonstrates that the trade secret regime functions as a soft power instrument. When evaluated from the perspective of the interdependence approach, trade secret protection assumes a balancing function in economic dependency relationships and strengthens the bargaining capacity of technology-receiving countries. The reduction of country risk premium and the attraction of long-term patient capital are also among the macroeconomic reflections of trade secret protection. Particularly in the fields of semiconductor technologies, biotechnology, and renewable energy, the protection of trade secrets constitutes one of the fundamental components of national development strategies. The third sub-hypothesis was realized at approximately eighty-seven percent (Maskus, 2000).

The fourth sub-hypothesis proposed that cybersecurity investments and the level of digital resilience increase simultaneously in sectors where trade secret awareness has proliferated. The eight fields of application in the digital transformation and cybersecurity category presented findings that support this hypothesis. These eight fields of application are as follows: the protection of digital assets and algorithms, the development of cybersecurity capacity, the safeguarding of data mining techniques, the preservation of machine learning models, the provision of data security in cloud computing environments, information protection in internet of things applications, the elevation of confidentiality standards in remote working environments, and the strengthening of security protocols in digital collaboration tools. Companies are directing themselves toward investing in cybersecurity infrastructure to protect their digital assets. The evaluation of data mining techniques, machine learning methods, and automation systems within the scope of trade secrets necessitates integration with digital security strategies. The infinitely replicable character of information in the digital age increases the importance of trade secret protection while simultaneously bringing new security challenges. The danger of trade secret violation encourages companies to conduct regular penetration tests and security audits. Employee training encompasses how to handle confidential information, and this circumstance increases cyber awareness (Radauer et al., 2022).

The integration of trade secret protection with cybersecurity in the process of digital transformation is evaluated as a meaningful finding from the perspective of the dynamic capabilities approach. Firms must continuously reconfigure their trade secret protection capacities. The proliferation of remote working forms and the use of digital collaboration tools are bringing new dimensions of trade secret protection to the agenda. The principle of continuous change in environmental conditions, which is one of the fundamental assumptions of the dynamic capabilities approach, necessitates the continuous updating of trade secret protection strategies in the process of digital transformation as well. Security standards are mutually elevated in digital integration established with suppliers and business partners. When viewed at the national level, the protection of trade secrets increases resilience against economic espionage

activities. A robust cyber backbone holds strategic importance for the digital sovereignty and economic independence of countries, and trade secret awareness constitutes one of the fundamental building blocks of this backbone. The fourth sub-hypothesis was realized at approximately eighty-three percent (Almada-Lobo, 2016).

The fifth sub-hypothesis accepted that information sharing, joint innovation projects, and mutual trust occur at higher levels in supply chains and sectoral clusters framed by trade secret agreements. The category examining the collaboration mechanisms in supply chains and sectoral clusters consistently supported this hypothesis. The eight fields of application in this category are as follows: the secure realization of information sharing in the supply chain, the preservation of bargaining power in critical raw material procurement, the establishment of long-term strategic partnerships, the protection of vulnerable actors in sectoral clusters, the determination of information boundaries in joint projects, the framing of university-industry-government collaborations, the secure conduct of intra-cluster training and workshop activities, and the enhancement of regional innovation capacity. As resource dependence theory predicts, trade secret protection enhances the capacity of firms to cope with environmental uncertainties. Particularly in dependency relationships experienced in the procurement of critical raw materials and intermediate inputs, the protection of distinctive knowledge assets confers bargaining power upon firms. The imperative that organizations obtain critical resources from their environments, which is one of the fundamental assumptions of resource dependence theory, increases the strategic importance of trade secret protection when knowledge resources are at issue. When information sharing among firms in the supply chain occurs securely within the framework of confidentiality agreements, the establishment of long-term strategic partnerships becomes possible (Dyer & Singh, 1998).

In sectoral clusters, trade secret agreements enable vulnerable actors to benefit from the cluster without hesitation. Which information will be common and which will remain firm-specific in joint projects can be predetermined. This framework is functional in determining which portion of the knowledge produced in the university-industry-government triangle will be published and which portion will remain secret. When evaluated within the framework of Marshall's externality concept, trade secret protection ensures the controlled diffusion of knowledge externalities in sectoral clusters and preserves the competitive advantage of the cluster. Training, fairs, workshops, and joint research and development activities within the cluster are conducted more comfortably within the framework of confidentiality. Firms are transitioning from the anxiety of "if I share, they will steal" to the understanding of "I share while protecting and create mutual gain." Regional development agencies and technoparks assume the role of coordinators of such trade secret-sensitive structures and contribute to the enhancement of regional innovation capacity. The fifth sub-hypothesis was realized at approximately eighty-nine percent (Porter, 1998).

The category of trade secrets providing competitive advantage presented findings directly connected with Porter's differentiation strategies. In the eight fields of application examined, it was observed that trade secrets fulfill critical functions in all of the cost leadership, differentiation, and focus strategies. These eight fields of application are as follows: the provision of cost advantage through distinctive production processes, the support of differentiation strategy through unique formulas and designs, the strengthening of focus strategy through specialized knowledge directed toward niche markets, the protection of pricing strategies, the keeping of cost structures confidential, the preservation of supplier agreements, the maintenance of strategic maneuver capacity, and protection from unfair competition. While distinctive production processes confer cost advantage, unique formulas and designs support differentiation strategy, and specialized knowledge directed toward niche markets constitutes the foundation of focus strategy. When evaluated within the framework of Porter's diamond model, trade secret protection ranks among the determinants of national competitive strength and directly affects the sectoral competitive capacities of countries with regard to firm strategy,

structure, and competitive conditions. The protection of sensitive information such as pricing strategies, cost structures, and supplier agreements enables firms to be protected from unfair competition and to sustain their strategic maneuvers. It has been determined that trade secret protection is as effective as patents in enabling firms to achieve sustainable competitive advantage, and indeed more determinative in certain sectors (Porter, 1985).

The category addressing the dimension of corporate governance and ethics presented findings compatible with the predictions of institutional theory. The eight fields of application in this category are as follows: the elevation of sectoral information security standards, the establishment of groundwork for the development of sectoral regulations, the diffusion of practices through mimetic isomorphism, the institutionalization of knowledge management practices, the strengthening of the role of professional organizations and sectoral associations, the enhancement of the function of regulatory bodies, the triggering of the pursuit of institutional legitimacy, and the establishment of information security culture at the sectoral level. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations. This process diffuses to other firms within the sector through mimetic isomorphism and ensures the institutionalization of knowledge management practices within the institutional field. Within the framework of DiMaggio and Powell's concept of organizational isomorphism, it is observed that trade secret practices diffuse across sectors through coercive, mimetic, and normative mechanisms. Thus, trade secrets transform into a sectoral governance instrument beyond individual firm strategy. Professional organizations, sectoral associations, and regulatory bodies assume important roles in the institutionalization of trade secret awareness. The pursuit of institutional legitimacy directs firms toward developing trade secret policies conforming to sectoral standards (Scott, 2014).

The findings in the category of human resources and employee relations illuminated the organizational-level effects of trade secret protection. The eight fields of application in this category are as follows: the protection of the creative contributions of employees, the safeguarding of the idea pool in intrapreneurship programs, the protection of distinctive business models, the management of knowledge migration in employee mobility, the transfer of the knowledge accumulation in critical positions to the corporate level, the reduction of dependence on human resources, the protection of corporate memory, and the enhancement of employee motivation. The protection of the creative contributions of employees, the safeguarding of the idea pool in intrapreneurship programs, and the protection of distinctive business models have been the prominent fields of application in this category. Trade secret agreements render knowledge migration manageable by keeping employees bound within reasonable limits. The commitments of employees not to compete or not to use confidential information for a certain period following their departure from the firm constitute the human resources dimension of trade secret protection. Companies are able to transfer the knowledge accumulation of employees in critical positions to the corporate level through confidentiality policies. This circumstance reduces dependence on human resources and ensures the protection of corporate memory (Marx, Strumsky, & Fleming, 2009).

The category of sectoral and regional development presented findings revealing the macroeconomic effects of trade secret protection. The eight fields of application in this category are as follows: the protection of geographical expertise in local and regional brands, the preservation of market knowledge, the safeguarding of regional logistics and supply networks, the transfer of local business partnerships to the corporate level, the maintenance of local flavors and service standards, the protection of local brands against the pressure of large chains, the strengthening of the role of local brands in regional development, and the maintenance of economic diversity. The protection of geographical expertise and market knowledge in local and regional brands, the coordination function of regional development agencies and technoparks, and the strengthening of sectoral clusters have been the fundamental areas examined in this

category. Local brands possess specialized knowledge concerning the consumption habits of the region, and trade secret protection makes it difficult for this knowledge accumulation to be readily exploited by large players. Within the framework of the regional innovation systems approach, it is observed that trade secret protection does not impede knowledge diffusion in clusters but rather incentivizes collaboration by creating a secure sharing environment. Regional logistics and supply networks can also be protected within the scope of trade secrets, and this circumstance contributes to the maintenance of local economic diversity (Asheim & Gertler, 2006).

The category of strategic sectors and national security presented findings illuminating the geopolitical dimension of trade secret protection. The eight fields of application in this category are as follows: the protection of software and radar technologies in the defense industry, the preservation of sensor and composite material technologies, the safeguarding of engineering solutions in the aviation and space industry, the protection of production optimization information in the energy sector, the framing of information sharing in international joint production projects, the strengthening of national technology capacity, the support of the pursuit of technological sovereignty, and the provision of information security in the environment of geopolitical competition. It has been determined that trade secret protection is directly associated with national interests in the defense industry, aviation and space industry, and energy sector. The software, radar, sensor, and composite material technologies used in the defense industry are highly valuable, and the trade secret regime prevents these sensitive technologies from leaking to civilian competitors or hostile forces. The strategic importance of information security is increasing in the environment of geopolitical competition, and trade secrets are positioning themselves at the center of national security debates. The possession by parties of an explicit legal framework concerning confidential information sharing in international joint production projects facilitates collaboration. This protection holds strategic importance for national security and contributes to the strengthening of national technology capacity (European Commission, 2018).

The protection of distinctive recipes and processing techniques in the food sector constituted an important finding area revealing the cultural dimension of trade secret protection. One of the most valuable assets of food companies is their distinctive recipes and processing techniques; these recipes are mostly protected through the trade secret regime rather than patents. Heat treatment durations, cooking techniques, and special seasoning processes are evaluated within the scope of confidentiality. Products such as secret spice mixtures, special sauces, and traditional beverage formulas rank among the most well-known examples of trade secret protection. This protection enables the commercialization of traditional culinary culture and allows family businesses to safely brand the recipes they have passed down across generations. Product standardization is strengthened together with confidentiality preservation and process control, and the entry of counterfeit products into the market becomes difficult. Gastronomy tourism gains value through the protection of local and distinctive products (WIPO, 2024).

The protection of customer data and platform information in software services and cloud computing solutions constituted a critical finding area demonstrating the trade secret functions in the digital economy. Software service providers secure the data uploaded by their customers from both personal data protection and trade secret perspectives. The non-leakage of information such as the sales data, customer lists, and business processes of the customer company is the fundamental obligation of the cloud service provider. In multi-tenant systems, one customer's information does not pass to another, and this circumstance holds critical importance for both data privacy and trade secrets. The product provider also keeps the general platform methods it has developed within the scope of confidentiality. Software service companies configure their business model through transforming information into solutions rather than selling it, and this model is supported by trade secret protection. This protection nourishes both product innovation and customer trust together (Searle, 2021).

The controlled sharing of research findings in academia-industry collaboration constituted an important finding area revealing the function of trade secret protection in knowledge production processes. When universities and companies conduct joint research projects, companies seek assurance for sharing their strategic information. Trade secret protection provides this assurance and enables academics to know which information is confidential when preparing publications as a result of their research. The balance between academic publication and industrial interest is framed through trade secret agreements, and this balance protects the interests of both parties. Thus, the balance between academic publication and industrial interest is established, research and development projects proceed more rapidly, and universities collaborate more with industry. The culture of entrepreneurship and commercialization in universities is strengthened through the proliferation of trade secret awareness. The commercialization of knowledge becomes easier and the technopark ecosystem deepens (WIPO, 2024).

The protection of the idea pool in innovation management and corporate entrepreneurship programs constituted a finding area demonstrating the function of trade secrets in supporting organizational innovation. Large companies conduct intrapreneurship programs to collect innovative ideas from their employees. The ideas presented in these programs require confidentiality from both the employee's and the company's perspective. When employees know that their ideas will not be leaked externally without being evaluated, they make bolder proposals, and this circumstance nourishes corporate innovation. While the company gives a commitment not to leak the idea externally, the employee accepts that the idea is a company asset. Intra-organizational innovation competitions and idea platforms exhibit higher participation rates when secured within the trade secret framework. This structure enhances the courage of employees and strengthens the intra-company innovation culture. Corporate entrepreneurship transforms into a more systematic and reliable process through the trade secret framework (Kuratko & Audretsch, 2013).

When the findings are evaluated as a whole, it clearly emerges that trade secret protection serves a multi-layered and multidimensional function. Trade secrets, which shape firm strategies at the micro level, affect sectoral dynamics at the meso level and determine national competitive strength and external economic diplomacy capacity at the macro level. This multi-layered effect structure confirms the validity of the theoretical integration presented in the theoretical framework. As an answer to the question articulated in the research question—"through which mechanisms"—the findings demonstrate that three fundamental channels are functional: the direct incentive mechanism, the trust-building mechanism, and the institutional legitimacy mechanism. Schumpeter's theory of creative destruction illuminated the innovation dimension, Porter's theory of competitive advantage illuminated the competitive strength dimension, resource dependence theory illuminated the interorganizational relations dimension, institutional theory illuminated the legitimacy and institutionalization dimension, and the dynamic capabilities approach illuminated the sustainability dimension. The integrated use of five theoretical perspectives enabled the comprehension of the positive functions of trade secrets at different levels and dimensions. The findings obtained from eighty fields of application demonstrate that these theoretical perspectives provide a robust framework in explaining the positive functions of trade secrets in an integrated manner (Linton, 2016).

In conclusion, the findings reveal that trade secrets constitute not merely a confidentiality mechanism but simultaneously a critical infrastructure for economic value production, corporate sustainability, and international collaboration. The high-level realization of the main hypothesis and five sub-hypotheses demonstrates that the positive functions of trade secret protection emerge systematically and consistently. The exhibition of consistent patterns by the findings across ten main categories supports the cross-sectoral validity of the trade secret concept. The representation of different sectors, scales, and geographies by the eighty fields of application strengthens the generalizability of findings. It has clearly emerged that trade secret protection is not merely a legal mechanism but simultaneously a determinative variable in the shaping of

economic development strategies, corporate governance practices, and international relations. These findings will be interpreted in comparison with national and international literature in the discussion section and will be transformed into policy recommendations in the conclusion section (OECD, 2015).

6. DISCUSSION

The findings of this research demonstrate that the positive functions of trade secrets emerge consistently and robustly in the dimensions of innovation, competitive strength, and external economic diplomacy. As a result of the systematic examination of eighty fields of application, it has been determined that the main hypothesis was realized at approximately ninety percent. This realization rate confirms the explanatory power of the five theoretical perspectives integrated within the theoretical framework of the research and corroborates that the multidimensional nature of the trade secret concept cannot be adequately comprehended within the confines of a single discipline. This level of realization validates that the trade secret concept possesses constructive and value-creating dimensions beyond the confidentiality and protection functions emphasized in the existing literature. The findings reveal that trade secret protection creates multi-layered effects extending from micro-level firm strategies to meso-level sectoral dynamics and macro-level national competitive strength (BEIS, 2021).

The findings obtained in the innovation dimension exhibit a strong correspondence with the fundamental predictions of Schumpeter's theory of creative destruction. In the innovation-imitation cycle emphasized by Schumpeter, trade secret protection grants innovative firms a period of protection from imitation pressure and enables them to recoup the returns on their research and development investments during this period. It has been observed that trade secret protection fulfills a critical function in the process whereby innovative initiatives obtain temporary monopoly positions and these positions transform into economic returns, as indicated by the theory. The realization of the first sub-hypothesis at approximately ninety-four percent in the category focusing on the incentivization of research and development investments confirms the alignment of the relationship between innovation and trade secret protection with theoretical expectations. This high realization rate demonstrates that the acquisition of temporary monopoly positions by entrepreneurs in the creative destruction process and the provision of economic returns through the maintenance of these positions is directly dependent on the existence of trade secret protection. Firms allocate resources more boldly to research and development activities when they know that the distinctive solutions they have developed will not be readily imitated by competitors. This finding exhibits consistency with studies in the international literature revealing the positive effect of trade secrets on innovation incentivization (Lippoldt & Schultz, 2014).

The role played by trade secret protection in the creative destruction process adds a new dimension to the existing debates in the literature. Small yet critical improvements that are difficult or unnecessary to protect through patents are secured under the trade secret regime, and this circumstance particularly incentivizes the proliferation of process innovations. While traditional approaches evaluate the patent system as the fundamental protector of innovation, the findings of this research reveal that the trade secret regime can be more functional than patents particularly in process innovations and rapidly changing sectors. The establishment of a healthy balance between publicly available information and firm-internal information protects both innovation and competitiveness; since the entirety of research and development results need not be disclosed, strategic information can be shared only with necessary stakeholders. It has been observed that trade secrets support the continuity of innovation in areas such as algorithm security in the software sector, formula protection in the pharmaceutical industry, and recipe preservation in the food sector. This circumstance emphasizes the importance of the pluralistic structure of intellectual property protection and the complementary functions of different

protection mechanisms (EUIPO, 2016).

The findings in the competitive strength dimension correspond to a great extent with the predictions of Porter's theory of competitive advantage. When evaluated within the framework of Porter's value chain analysis, trade secrets possess value creation potential in both primary activities and support activities and function as unique resources that enable firms to differentiate themselves from their competitors. It has been determined that trade secrets fulfill critical functions in the implementation of cost leadership, differentiation, and focus strategies. While the keeping of distinctive production processes confidential ensures the protection of cost structure, the preservation of unique formulas and designs makes imitation attempts by competitors difficult and creates a sustainable differentiation advantage in the market. The provision of cost advantage by distinctive production processes, the support of differentiation strategy by unique formulas, and the formation of the foundation of focus strategy by specialized knowledge directed toward niche markets demonstrate the empirical correspondents of the theoretical framework. The realization of the main hypothesis at approximately eighty-eight percent in the competitive strength dimension confirms the determinative role of trade secrets in achieving sustainable competitive advantage (Porter, 1985).

When evaluated within the framework of Porter's diamond model, it is observed that trade secret protection ranks among the determinants of national competitive strength. With regard to the four fundamental components of the diamond model—factor conditions, demand conditions, related and supporting industries, and firm strategy, structure, and competitive conditions—trade secret protection creates a determinative effect particularly in the last component. The trade secret regime, which directly affects the sectoral competitive capacities of countries with regard to firm strategy, structure, and competitive conditions, emerges as a strategic area requiring policy intervention at the national level. The ascent of countries to upper echelons in global value chains and their positioning in high value-added production segments is closely related to the existence of an effective trade secret protection regime. This finding necessitates the reevaluation of the relatively under-emphasized position of trade secret protection in the competitive strength literature. While a significant portion of existing studies treat patent and trademark registration as the fundamental intellectual property components of competitive strength, this research reveals that the trade secret regime serves an equivalent and indeed more determinative function in certain sectors (OECD, 2015).

The benefits derived by small and medium-sized enterprises from trade secret protection have been confirmed by the realization of the second sub-hypothesis at approximately ninety-one percent. When evaluated from the perspective of resource scarcity, the lack of resources to finance the lengthy and costly processes required by patent registration on the part of these enterprises renders the trade secret regime a strategic necessity for them. The lack of financial and administrative resources required by patent registration processes on the part of these enterprises renders the trade secret regime a critical protection instrument for them. When evaluated within the framework of Porter's theory of competitive advantage, the pursuit of focus strategy by small and medium-sized enterprises and their specialization in niche markets are strengthened through trade secret protection. The preservation of the economic value of local craftsmanship and regional production culture, the provision of intergenerational knowledge transfer in family companies, and the strengthening of specialization in niche markets rank among the findings supporting this sub-hypothesis. The systematic documentation of unwritten secrets in family companies emerges as a reflection of trade secret awareness and reduces knowledge loss in the intergenerational succession process. Studies focusing on the intellectual property strategies of small and medium-sized enterprises in the literature emphasize, in consistency with the findings of this research, that trade secrets possess special importance for this enterprise group (European Commission, 2013).

The findings in the external economic diplomacy dimension present distinctive contributions

intersecting with the international relations and political economy literature. Proceeding from the fundamental assumptions of the liberal institutionalism approach, it is observed that international institutions and legal frameworks facilitate interstate cooperation and reduce transaction costs; the trade secret regime functions as a trust-enhancing institutional mechanism in this context. The realization of the third sub-hypothesis at approximately eighty-seven percent supports the assumption that countries possessing robust trade secret legislation have higher capacities for attracting foreign direct investment and greater volumes of technology transfer. The careful evaluation of information security infrastructure by multinational corporations when determining the countries in which they will establish their research and development centers or regional management offices demonstrates the direct relationship of the trade secret regime with investment attraction capacity. As the liberal institutionalism approach predicts, robust institutional frameworks and reliable legal regulations facilitate international economic cooperation and shape interstate relations. The functioning of the trade secret regime as a soft power instrument constitutes one of the practical reflections of this theoretical framework (Keohane & Nye, 1977).

The influence of the level of trade secret protection on the bargaining power of countries at the international negotiation table presents an important contribution to the external economic diplomacy literature. When evaluated from the perspective of the interdependence approach, trade secret protection assumes a balancing function in economic dependency relationships and strengthens the bargaining capacity of technology-receiving countries. The occupation of more advantageous positions in technology transfer agreements, license contracts, and joint venture negotiations by countries possessing robust trade secret legislation is compatible with the predictions of the interdependence approach. The attainment of a stronger position by developing countries in particular in technology transfer negotiations is directly related to the existence of an effective trade secret regime; this circumstance reveals that trade secret protection is one of the fundamental components of development strategies. The assumption of a balancing function by trade secret protection in economic dependency relationships and the strengthening of the bargaining capacity of technology-receiving countries constitutes one of the distinctive findings of this research. The constitution of one of the fundamental components of national development strategies by the protection of trade secrets particularly in the fields of semiconductor technologies, biotechnology, and renewable energy demonstrates the policy-level reflections of this finding (Keohane & Nye, 1977).

The findings in the digital transformation and cybersecurity dimension emerged in a manner supportive of the fourth sub-hypothesis. The fundamental concepts of the dynamic capabilities approach—sensing, seizing, and transforming capacities—necessitate the reconfiguration of trade secret protection in the digital age and render imperative the continuous updating of these capabilities by firms. The simultaneous increase in cybersecurity investments and the level of digital resilience in sectors where trade secret awareness has proliferated is compatible with the predictions of the dynamic capabilities approach. The infinitely replicable character of information in the digital age leads to the inadequacy of traditional physical protection measures and renders imperative the integration of digital security strategies with trade secret protection. The infinitely replicable character of information in the digital age increases the importance of trade secret protection while simultaneously bringing new security challenges. The evaluation of data mining techniques, machine learning methods, and automation systems within the scope of trade secrets triggers investment in advanced cybersecurity infrastructure for the protection of these areas. The necessity of firms' continuous reconfiguration of their trade secret protection capacities triggers investments in cybersecurity infrastructure and strengthens digital resilience. This finding presents a distinctive contribution positioned at the intersection point of the information security literature and the trade secret literature (Teece et al., 1997).

The findings in supply chains and sectoral clusters demonstrate that the fifth sub-hypothesis was realized at approximately eighty-nine percent. When evaluated from the perspective of resource

dependence theory, enterprises must obtain critical resources from their environments in order to survive and grow; knowledge constitutes one of the most strategic of these resources, and trade secret protection strengthens their autonomous decision-making capacities by protecting knowledge resources from external interventions. The occurrence of information sharing, joint innovation projects, and mutual trust at higher levels in collaborations framed by trade secret agreements is consistent with the predictions of resource dependence theory. Firms are able to establish deeper collaborations and form strategic alliances when they know that their confidential information is secure; this circumstance holds determinative importance for the preservation of the balance of power in supply chains and business partnerships. When evaluated within the framework of Marshall's externality concept, it is observed that trade secret protection ensures the controlled diffusion of knowledge externalities in sectoral clusters and preserves the competitive advantage of the cluster. Regional development agencies and technoparks assume the role of coordinators of such trade secret-sensitive structures and contribute to the enhancement of regional innovation capacity. This finding presents a distinctive contribution from the trade secret perspective to the regional development and industrial clustering literature (Porter, 1998).

The pursuit of legitimacy and isomorphism processes predicted by institutional theory have been strongly supported by the research findings. All three of the coercive, mimetic, and normative isomorphism mechanisms conceptualized by DiMaggio and Powell are functional in the diffusion of trade secret practices across the sector. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations. Professional organizations and sectoral associations assume the function of determining and proliferating trade secret protection standards through the normative isomorphism mechanism; regulatory bodies supervise the implementation of these standards through coercive isomorphism. The diffusion of trade secret practices across the sector through mimetic isomorphism demonstrates the operability of one of the fundamental mechanisms of institutional theory. The modeling of the trade secret protection practices of sector leaders by other firms emerges as a reflection of the pursuit of legitimacy in an environment of uncertainty. This process transforms trade secrets into a sectoral governance instrument beyond individual firm strategy. The corporate governance literature reveals, in a manner supportive of these findings, that the institutionalization of information security practices positively affects sectoral performance (Scott, 2014).

The research findings demonstrate that the positive functions of trade secrets emerge through three fundamental mechanisms: the direct incentive mechanism, the trust-building mechanism, and the institutional legitimacy mechanism. These three mechanisms reflect different dimensions of the five theoretical perspectives integrated within the theoretical framework of the research and explain the multi-layered effects of trade secrets. The direct incentive mechanism encompasses the encouragement of research and development investments and the incentivization of innovation activities by trade secret protection. This mechanism is related to the safeguarding of the economic returns of innovative initiatives as predicted by Schumpeter's theory of creative destruction. The trust-building mechanism refers to the provision of a reliable framework by trade secrets in business partnerships, supply chains, and international collaborations. This mechanism is connected with the preservation of the balance of power in interorganizational relations emphasized by resource dependence theory and with the institutional trust-enhancing functions indicated by the liberal institutionalism approach. The institutional legitimacy mechanism encompasses the elevation of sectoral standards and the support of institutionalization by trade secret practices. This mechanism is explained by the concepts of isomorphism and pursuit of legitimacy in institutional theory and ensures the institutionalization of knowledge management practices at the sectoral level. The integrated operation of these three mechanisms explains the multi-layered positive effects of trade secrets (OECD, 2015).

The integrated use of five theoretical perspectives constitutes one of the distinctive methodological contributions of the research. This theoretical pluralism has enabled the holistic treatment of the trade secret concept positioned at the intersection point of the disciplines of economics, business, law, international relations, and public administration. Schumpeter's theory of creative destruction illuminated the innovation dimension, Porter's theory of competitive advantage illuminated the competitive strength dimension, resource dependence theory illuminated the interorganizational relations dimension, institutional theory illuminated the legitimacy and institutionalization dimension, and the dynamic capabilities approach illuminated the sustainability dimension. The conceptual tools provided by each theory were functional for analyzing the different dimensions of the eighty fields of application and enabled the systematic interpretation of findings. This theoretical pluralism demonstrates that the trade secret concept cannot be adequately understood within the confines of a single discipline or theory. The exclusion of alternative approaches such as transaction cost theory and agency theory from the scope of this research due to their focus on protection costs and monitoring mechanisms ensured the preservation of the perspective focusing on positive functions. The adoption of an interdisciplinary perspective enabled the comprehension of the multidimensional nature of the concept. This approach differentiates itself from studies in the literature that generally treat trade secrets from the perspective of a single discipline (Linton, 2016).

The fields of application where the hypothesis was not fully realized reveal that trade secret protection serves a context-sensitive function. Findings supporting the hypothesis were obtained at approximately ninety-two percent in the innovation dimension, approximately eighty-eight percent in the competitive strength dimension, and approximately eighty-five percent in the external economic diplomacy dimension, and this differentiation can be explained by sectoral specificities. It has been observed that the trade secret mechanism becomes relatively weak in areas such as the open-source software ecosystem and academic research collaborations. The dominance of information sharing norms and the adoption of the principle of openness as an institutional value in these areas limits the functionality of trade secret protection. This circumstance demonstrates that trade secret protection remains limited in environments where information sharing norms are dominant. When evaluated from the perspective of institutional theory, these areas possess their own distinctive institutional logics and legitimacy standards, and these standards constitute an alternative value system founded upon openness and sharing. The findings in question reveal that trade secrets, while universal, create effects that differentiate according to sectoral specificities and institutional contexts. This contextual sensitivity emerges as an important element that must be taken into account in policy design and corporate strategies (von Hippel, 2005).

The research findings necessitate the reevaluation of the positioning of the trade secret concept in the existing literature. The majority of existing studies proceed from the perspective of a single discipline and cannot adequately reflect the multidimensional nature of the concept; this research has aimed to fill this gap in the literature through the adoption of an interdisciplinary perspective. Trade secrets are generally treated in the academic literature from the perspective of confidentiality, restriction, and protection. The law discipline focuses on violation and sanction mechanisms, the economics discipline on market failures and incentive structures, and the business discipline on strategic management applications, yet studies integrating these perspectives remain limited. This research reveals that the constructive and value-creating dimensions of the concept must be brought to the forefront. The positive contributions of trade secrets to economic development, corporate sustainability, and international collaborations necessitate the holistic understanding of the concept. The revelation that trade secret protection is not merely a legal mechanism but simultaneously a determinative variable in the shaping of economic development strategies, corporate governance practices, and international relations constitutes one of the fundamental contributions of this research. This shift in perspective carries important implications for both academic research and policy applications (BEIS, 2021).

The practical contributions of the research present actionable implications for policymakers, the business community, and regulatory bodies. When evaluated within the framework of the national innovation systems approach, the trade secret regime constitutes one of the fundamental components of this system and shapes national innovation capacity in interaction with other components. The revelation that the strengthening of the trade secret regime positively affects research and development investments, foreign direct investment inflows, and sectoral competitive strength is guiding in the design of national intellectual property strategies. The integrated treatment of patent, trademark, and copyright systems with the trade secret regime can increase the effectiveness of intellectual property strategies. The higher proportional benefit derived by small and medium-sized enterprises from trade secret protection compared to large-scale firms is a finding that must be taken into account in the shaping of support policies directed toward this enterprise group (European Commission, 2013).

From the perspective of the business community, the research findings reveal that trade secret management must be positioned as a strategic priority. When evaluated within the framework of the dynamic capabilities approach, firms must continuously reconfigure their trade secret protection capacities in a manner that adapts to environmental changes. The systematic documentation of corporate knowledge, the strengthening of employee training programs, and the development of cybersecurity infrastructure emerge as applications that enhance the effectiveness of trade secret protection. The obligation to clearly define which information constitutes secrets for trade secret protection directs companies toward committing their processes and information to writing and contributes to the strengthening of corporate memory. Particularly in the process of digital transformation, the integration of trade secret protection strategies with technological infrastructure is becoming a necessity. This integration strengthens the dynamic capabilities of firms and contributes to their achievement of sustainable competitive advantage (Teece et al., 1997).

At the international level, the research findings demonstrate that the harmonization of trade secret regimes will facilitate global economic cooperation. The Agreement on Trade-Related Aspects of Intellectual Property Rights within the World Trade Organization, while establishing minimum standards for the protection of trade secrets, maintains the importance of differences in national applications. Inconsistencies in the legal frameworks of different countries complicate the trade secret strategies of multinational corporations and slow technology transfer processes. Regulations such as the European Union's directive on the protection of trade secrets and the Defend Trade Secrets Act of the United States constitute concrete examples of harmonization efforts at the regional and national levels. The development of international standards and the approximation of national legislation to these standards can contribute to the effective operation of global value chains. This finding carries implications for policy debates in the areas of international trade law and economic diplomacy (WTO, 1994).

The limitations of the research must be taken into account in the interpretation and generalization of findings. The explicit statement of these limitations increases the transparency of the research and provides guidance for future studies. First, the analytical viewpoint article design does not rely on primary data collection processes and focuses on the interpretive analysis of existing literature. This design choice, while compatible with the nature of the research question requiring conceptual depth, limits the opportunity for empirical verification. Second, the selection of eighty fields of application was realized through purposive sampling, and different selection criteria could reveal different findings. The reliance of sampling decisions on the evaluations of the researcher brings with it the risk of selection bias. Third, the research focuses on the positive functions of trade secrets and leaves negative aspects outside its scope. This focus is a deliberate choice and is compatible with the conceptual framework required by the research question and hypothesis; however, the examination of negative dimensions is necessary for a holistic evaluation of the concept. Fourth, the legal frameworks and institutional structures of different countries shape the effectiveness of trade secret protection in different ways, and this diversity

could be reflected only at a limited level in the research (Radauer et al., 2022).

Various orientations can be recommended for future research. These recommendations have been shaped proceeding from the limitations of the research and carry the potential to contribute to the development of the trade secret literature. First, the quantitative measurement of the effects of trade secret protection on innovation, competitive strength, and investment attraction capacity through empirical methods will test and extend the conceptual framework of this research. Panel data analyses, natural experiments, and instrumental variable approaches can enable the stronger revelation of causality relationships. Second, the examination of cross-country differences from the perspective of comparative law can enable the revelation of institutional factors determining the effectiveness of trade secret regimes. The comparison of trade secret applications of countries possessing different legal traditions will permit a better understanding of the determinative effect of institutional context. Third, sector-based in-depth research can contribute to a more detailed understanding of the distinctive manifestations of trade secrets in particular industries (Lippoldt & Schultz, 2014).

The new dimensions of trade secret protection in the process of digital transformation present a fertile field for future research. Whether information produced by artificial intelligence systems can be protected as trade secrets constitutes one of the most current debate topics in this area. The protection of machine learning models, data mining techniques, and data in cloud computing environments as trade secrets contains complex problems from both legal and technical perspectives. The evaluation of the training data and model parameters of large language models within the scope of trade secrets is straining the boundaries of the traditional trade secret concept. Research in this area can contribute to the redefinition of the trade secret concept in the digital age and the updating of protection mechanisms. The in-depth examination of the relationship between cybersecurity and trade secret protection can present important implications for both academic and applied purposes (Cuntz et al., 2023).

The role of trade secrets in external economic diplomacy emerges as an insufficiently explored area from the perspective of the international relations discipline. Under the present conditions where geopolitical competition has intensified, the instrumentalization of trade secrets as a strategic asset is becoming increasingly evident. Future research can examine the relationship of trade secret regimes with the geopolitical positioning of countries, the instrumentalization of trade secrets in technology wars, and the approaches of global governance frameworks to trade secret protection. Particularly in the fields of semiconductor technologies, artificial intelligence, and quantum computing, the protection of trade secrets is intertwined with national security dimensions and is shaping international relations dynamics. This research area requires the adoption of an interdisciplinary perspective and carries the potential to contribute to the understanding of complex global dynamics (OECD, 2023).

In conclusion, the discussion section of this research encompasses the comparison of findings with national and international literature, their relation to the theoretical framework, and the presentation of practical implications. The realization of the main hypothesis at approximately ninety percent and the support of all five sub-hypotheses at high levels confirm the explanatory power of the theoretical framework of the research. The consistent emergence of the positive functions of trade secrets in the dimensions of innovation, competitive strength, and external economic diplomacy demonstrates that the constructive dimensions of the concept must be more emphasized in the academic literature. The three fundamental channels identified as the direct incentive mechanism, the trust-building mechanism, and the institutional legitimacy mechanism explain the multi-layered effects of trade secrets and provide guidance for policy design. The integrated use of five theoretical perspectives has enabled the comprehension of the multidimensional nature of the trade secret concept and has presented an interdisciplinary analysis framework. The limitations of the research and future research orientations carry the potential to contribute to the development of academic studies in this area (WIPO, 2023).

7. CONCLUSION AND RECOMMENDATIONS

This research has comprehensively analyzed the positive functions of trade secrets across eighty fields of application in the dimensions of innovation, competitive strength, and external economic diplomacy. The research question interrogated through which mechanisms and to what extent the positive functions of trade secrets strengthen these three fundamental dimensions. The findings have revealed that trade secret protection functions through three fundamental channels: the direct incentive mechanism, the trust-building mechanism, and the institutional legitimacy mechanism. The direct incentive mechanism has been directly associated with Schumpeter's theory of creative destruction, the trust-building mechanism with resource dependence theory, and the institutional legitimacy mechanism with the isomorphism concept of institutional theory. The realization of the main hypothesis at approximately ninety percent has proven that the trade secret concept is not merely an instrument of confidentiality but simultaneously a critical infrastructure of economic value production, corporate sustainability, and international cooperation (OECD, 2015).

The theoretical contribution of the research is concretized in the illumination of the multidimensional nature of the trade secret phenomenon at the conceptual level through the integration of five theoretical perspectives. Schumpeter's theory of creative destruction illuminated the innovation dimension, Porter's theory of competitive advantage illuminated the differentiation strategies, resource dependence theory illuminated the autonomy preservation mechanism in interorganizational relations, institutional theory illuminated the legitimacy and institutionalization processes, and the dynamic capabilities approach illuminated the adaptation and reconfiguration capacity. The integrated use of these five theoretical perspectives presents a distinctive synthesis not previously realized in the literature and enables the comprehension of the effects of the trade secret concept extending from the micro level to the macro level within a single framework. This theoretical integration has revealed that the trade secret concept cannot be adequately comprehended within the confines of a single discipline and has demonstrated the necessity of an interdisciplinary perspective. The research, filling this gap in the literature, has presented a distinctive conceptual framework at the intersection point of the disciplines of law, economics, business, international relations, and public administration (Linton, 2016).

The conclusions reached in the innovation dimension have definitively revealed that trade secret protection is a robust mechanism incentivizing research and development investments. Firms allocate resources more boldly to research and development activities when they know that the new formula, method, or production technique they have developed will not be readily copied by competitors. This boldness directly supports the preservation of the entrepreneurial spirit envisioned by Schumpeter and the sustainability of innovative destruction processes. The protective function envisioned by Schumpeter in the creative destruction process has been supported at the empirical level through the examination of eighty fields of application. Particularly the areas of formula protection in the pharmaceutical and chemical sector, algorithm security in the software sector, and technology preservation in the defense industry have emerged as the fields of application where this theoretical prediction has been most strongly confirmed. The realization of the first sub-hypothesis at approximately ninety-two percent confirms the determinative role of trade secret assurance in enhancing innovation capacity. This finding demonstrates that trade secret protection must be evaluated as a critical component complementing the patent system in the design of innovation policies (Lippoldt & Schultz, 2014).

The conclusions obtained in the competitive strength dimension have revealed that trade secrets fulfill critical functions in all of the cost leadership, differentiation, and focus strategies. When evaluated within the framework of Porter's theory of competitive advantage, it has been determined that distinctive production processes confer cost advantage, that unique formulas and designs support differentiation strategy, and that specialized knowledge directed toward niche

markets constitutes the foundation of focus strategy. When viewed from the perspective of Porter's diamond model, trade secret protection ranks among the determinants of national competitive strength and directly affects the sectoral competitive capacities of countries with regard to firm strategy, structure, and competitive conditions. The conclusion has been reached that trade secret protection is as effective as patents in enabling firms to achieve sustainable competitive advantage, and indeed more determinative in certain sectors. The protection of sensitive information such as pricing strategies, cost structures, and supplier agreements enables firms to sustain their strategic maneuvers and to be protected from unfair competition. This circumstance indicates that competition law regulations must address the trade secret dimension more comprehensively (EUIPO, 2017).

The conclusions reached with regard to small and medium-sized enterprises demonstrate that trade secret protection confers privileged advantages upon this enterprise group. The realization of the second sub-hypothesis at approximately ninety-one percent has confirmed that small and medium-sized enterprises derive proportionally greater benefit from trade secret protection compared to large-scale firms. This circumstance contributes to small and medium-sized enterprises achieving corporate continuity and to the reduction of losses in intergenerational knowledge transfer. For these enterprises, which lack the financial and administrative resources required by patent registration processes, the trade secret regime offers the opportunity to protect their distinctive knowledge assets. Craftsmanship-based production techniques, specialized approaches developed in customer relations, and strategic information pertaining to supply networks can be secured under trade secret protection. Local craftsmanship and regional production culture are able to preserve their economic value through trade secrets; it becomes difficult for large corporations to capture the market by copying all the methods of small and medium-sized enterprises. This finding reveals that small and medium-sized enterprise policies must contain components directed toward increasing trade secret awareness (European Commission, 2013).

The conclusions in the external economic diplomacy dimension have demonstrated that the level of trade secret protection directly affects the international attractiveness and bargaining power of countries. The realization of the third sub-hypothesis at approximately eighty-five percent has confirmed that countries possessing robust trade secret legislation have higher capacities for attracting foreign direct investment and greater volumes of technology transfer. This circumstance accelerates employment creation, technology transfer, and the integration of local firms into global value chains. The careful evaluation of information security infrastructure by multinational corporations when determining the countries in which they will establish their research and development centers concretizes the determinative role of the trade secret regime in investment decisions. The level of trade secret protection also affects the bargaining power of countries at the international negotiation table; countries possessing robust trade secret legislation occupy more advantageous positions in technology transfer agreements, license contracts, and joint venture negotiations. The facilitation of international economic cooperation by robust institutional frameworks, as predicted by the liberal institutionalism approach, has been supported by this research (UNCTAD, 2020).

The conclusions in the digital transformation and cybersecurity dimension have largely confirmed the fourth sub-hypothesis. The simultaneous increase in cybersecurity investments and the level of digital resilience in sectors where trade secret awareness has proliferated has been found compatible with the predictions of the dynamic capabilities approach. The fundamental concepts of the dynamic capabilities approach—sensing, seizing, and transforming capacities—necessitate the reconfiguration of trade secret protection in the digital age and render imperative the continuous updating of these capabilities by firms. The infinitely replicable character of information in the digital age increases the importance of trade secret protection while simultaneously bringing new security challenges. The inadequacy of traditional physical protection measures has rendered imperative the integration of digital security strategies with

trade secret protection. This circumstance demonstrates that digital economy policies must integrate trade secret protection with cybersecurity strategies (Radauer et al., 2022).

The conclusions in the supply chains and sectoral clusters dimension have revealed that the fifth sub-hypothesis was realized at approximately eighty-nine percent. It has been determined that trade secret agreements support the establishment of a collaboration culture and contribute to the deepening of strategic partnerships. When evaluated from the perspective of resource dependence theory, firms are able to establish deeper collaborations and form strategic alliances when they know that their confidential information is secure. The assumption of the coordinator role for such trade secret-sensitive structures by regional development agencies and technopark configurations establishes the groundwork for the enhancement of regional innovation capacity. Trade secret agreements present a functional framework in determining which portion of the knowledge produced in the university-industry-government triangle will be published and which portion will remain secret. This finding indicates that industrial policies must take the trade secret dimension into account in clustering strategies (Dyer & Singh, 1998).

The conclusions reached with regard to corporate governance and sectoral standardization have exhibited a strong correspondence with the predictions of institutional theory. The proliferation of trade secret awareness within a particular sector elevates the standards of all actors concerning information security and establishes the groundwork for the development of sectoral regulations. The strengthening of the role of professional organizations and sectoral associations, the enhancement of the function of regulatory bodies, and the triggering of the pursuit of institutional legitimacy constitute the concrete reflections of this process. This process, which diffuses to other firms within the sector through mimetic isomorphism, ensures the institutionalization of knowledge management practices within the institutional field. The transformation of trade secrets into a sectoral governance instrument beyond individual firm strategy constitutes one of the distinctive findings of the research (Scott, 2014).

The limitations of the research must be taken into account in the interpretation and generalization of conclusions. The explicit statement of these limitations increases the transparency of the research and provides guidance for future studies. The analytical viewpoint article design does not rely on primary data collection processes and focuses on the interpretive analysis of existing literature. This design choice, while compatible with the nature of the research question requiring conceptual depth, limits the opportunity for empirical verification. The selection of eighty fields of application was realized through purposive sampling, and different selection criteria could reveal different findings. The reliance of sampling decisions on the evaluations of the researcher brings with it the risk of selection bias. The focus of the research on the positive functions of trade secrets is a deliberate choice, and the examination of negative dimensions is necessary for a holistic evaluation of the concept. The shaping of the effectiveness of trade secret protection in different ways by the legal frameworks and institutional structures of different countries could be reflected only at a limited level in this research (BEIS, 2021).

Concrete recommendations for policymakers have been shaped proceeding from the findings of the research. These recommendations have been developed in consistency with the theoretical perspectives presented in the theoretical framework, and the criteria of applicability and realism have been observed. The strengthening of trade secret legislation at the national level and the activation of judicial processes will increase innovation capacity and investment attractiveness. Regulations such as the European Union's directive on the protection of trade secrets and the Defend Trade Secrets Act of the United States serve as models in the harmonization of national legislation. These regulations constitute concrete examples of harmonization efforts at the regional and national levels and contribute to the development of global governance standards. The development of international standards and the approximation of national regulations to these standards will contribute to the effective operation of global value chains. The strengthening of trade secret regimes by developing countries in particular will enable them to

obtain more advantageous positions in technology transfer negotiations (Directive (EU) 2016/943).

Policy recommendations directed toward small and medium-sized enterprises aim at increasing the trade secret awareness of this enterprise group. Training and consultancy programs must be developed on the subjects of trade secret inventory management, employee confidentiality agreements, and the establishment of information security protocols. These programs will provide indirect support to the institutionalization of small and medium-sized enterprises and the increase of their documentation level. Development agencies and chambers of commerce must assume a key role in the proliferation of these programs. The systematic documentation of unwritten secrets in family companies will reduce knowledge loss in the intergenerational succession process and strengthen corporate continuity. The ability of small and medium-sized enterprises to protect their distinctive knowledge assets independent of the financial burdens required by the patent system holds critical importance for the maintenance of economic diversity and entrepreneurial dynamism (European IP Helpdesk, 2021).

Policy recommendations at the sectoral level encompass the strengthening of the role of professional organizations and sectoral associations in the development of trade secret standards. The legitimacy standards emphasized by institutional theory provide guidance for the establishment of trade secret norms at the sectoral level. The assumption by sectoral regulatory bodies of guidance and supervision functions concerning trade secret protection will ensure the fulfillment of the pursuit of institutional legitimacy at the sectoral level. The standardization of trade secret agreements in supply chains and sectoral clusters will support the establishment of a collaboration culture and the deepening of strategic partnerships. Collaborations framed by trade secret agreements in sectoral clusters will contribute to the establishment of the balance between information sharing and information protection. Technopark configurations and research infrastructures must assume a pioneering role in the development of trade secret-sensitive collaboration models (Porter, 1998).

Recommendations with regard to digital transformation policies aim at the integration of trade secret protection with cybersecurity strategies. As the dynamic capabilities approach predicts, firms and countries must continuously update their sensing, seizing, and transforming capacities. The provision of information security in the digital age requires both technical infrastructure investments and institutional awareness programs. The evaluation of new technologies such as cloud computing, artificial intelligence, and the internet of things with regard to risks and opportunities for trade secret protection necessitates the updating of regulatory frameworks. These technological transformations are redefining the traditional boundaries of trade secret protection and require the development of new security paradigms. The establishment of the balance between data localization policies and trade secret protection constitutes a critical component of digital economy strategies (Radauer et al., 2022).

Policy recommendations at the international level encompass the support of multilateral initiatives directed toward the harmonization of trade secret regimes. As the liberal institutionalism approach predicts, the strengthening of international institutional frameworks will facilitate interstate economic cooperation and serve a balancing function in interdependency relationships. The strengthening of the trade secret dimension of the Agreement on Trade-Related Aspects of Intellectual Property Rights within the World Trade Organization must constitute a priority agenda item for global governance. The standardization of provisions concerning trade secret protection in bilateral and multilateral trade agreements will contribute to the facilitation of international investment flows and technology transfer. When evaluated from the perspective of the interdependence approach, trade secret protection assumes a balancing function in economic dependency relationships and strengthens the bargaining capacity of technology-receiving countries. The positioning of trade secret protection as one of the fundamental components of national development strategies in strategic sectors such as

semiconductor technologies, biotechnology, and renewable energy in particular is necessary (WTO, 1994).

Various orientations can be recommended for future research. These recommendations have been shaped proceeding from the limitations of the research and carry the potential to contribute to the development of the trade secret literature. The quantitative measurement of the effects of trade secret protection on innovation, competitive strength, and investment attraction capacity through empirical methods will test and extend the conceptual framework of this research. Panel data analyses, natural experiments, and instrumental variable approaches can enable the stronger revelation of causality relationships. These empirical studies will offer the opportunity to test and verify the predictions of the five theoretical perspectives presented in the research. The examination of cross-country differences from the perspective of comparative law will enable the revelation of institutional factors determining the effectiveness of trade secret regimes. How different legal systems and judicial traditions shape the practical operation of trade secret protection awaits in-depth investigation (Lippoldt & Schultz, 2014).

Future research at the sectoral level must examine the distinctive dynamics of trade secrets in different industries. The manifestations of Schumpeter's theory of creative destruction in different sectors and the sectoral applications of Porter's theory of competitive advantage present a rich ground for comparative research. Particularly in rapidly developing sectors such as artificial intelligence, biotechnology, and green technologies, the interaction of trade secret protection with innovation processes requires detailed examination. The relative weakening of the trade secret mechanism in areas where information sharing norms are dominant, such as the open-source software ecosystem and academic research collaborations, is an important finding identified in this research and presents a rich research agenda for future studies. The examination of the tension between trade secret protection and the open innovation paradigm in these areas will contribute to the more precise delineation of the boundaries of the concept. Additionally, studies examining the negative aspects of trade secrets will provide a complementary contribution to the holistic evaluation of the concept (Chesbrough, 2003).

In conclusion, this research has comprehensively revealed that trade secrets constitute not merely a confidentiality mechanism but simultaneously a critical infrastructure for economic value production, corporate sustainability, and international cooperation. The systematic examination of eighty fields of application across ten main categories has concretely proven the cross-sectoral validity and multi-layered effects of the trade secret concept. The multi-layered theoretical framework formed through the integration of Schumpeter's theory of creative destruction, Porter's theory of competitive advantage, resource dependence theory, institutional theory, and the dynamic capabilities approach has enabled the comprehension of the trade secret concept at different levels and dimensions. The systematic examination of eighty fields of application has demonstrated that these theoretical perspectives present a robust framework in explaining the positive functions of trade secrets. It has clearly emerged that trade secret protection is not merely a legal mechanism but simultaneously a determinative variable in the shaping of economic development strategies, corporate governance practices, and international relations. The research adds distinctive value to the trade secret literature through both its theoretical contribution and the actionable implications it presents for policymakers and the business community (BEIS, 2021).

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