


Article

# Management of Strategic Alliances in Portuguese Service-Based SMEs: Exploring the Role of Dynamic Capabilities in Developing Innovation Capabilities

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## Abstract

Strategic alliances have assumed a pivotal role in the growth and competitiveness of organisations, especially in contexts of rapid technological change and high environmental complexity. Drawing on the Dynamic Capabilities View (DCV), this study aims to analyse the impact of strategic alliance management on technological, marketing, and new product development capabilities, considering the mediating role of dynamic capabilities. This research is based on a sample of 200 Portuguese firms, predominantly SMEs, using Structural Equation Modelling (SEM) to test a conceptual model composed of six hypotheses. The results demonstrate that effective alliance management is positively associated with dynamic capabilities, which in turn function as a pivotal mechanism for integrating and reconfiguring resources. Specifically, the findings reveal that these dynamic capabilities (exploration and exploitation) are fundamental to strengthening marketing and technological skills. Notably, technological capability did not yield a significant direct impact on new-product development, suggesting that in this service-intensive context, marketing capabilities and the overall orchestration of dynamic routines are more critical to innovation success. This research offers empirical evidence of how strategic alliances strengthen the competitiveness of SMEs in peripheral EU economies, highlighting that innovation stems from a configuration of integrative capabilities rather than technological assets alone.

**Keywords:** strategic alliances; dynamic capabilities; technological capability; marketing capability; new product development; Portugal; structural equation modelling



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## 1. Introduction

Organisations increasingly rely on strategic alliances to overcome internal capability gaps by integrating external resources to exploit market opportunities or mitigate risk (Al-Tabbaa & Zahoor, 2024; He et al., 2024; Ratten, 2023). Voluntary partnerships between independent firms facilitate the development and commercialisation of new products, services, and technologies (Jiang et al., 2022). Such medium- to long-term collaborations enable the orchestration of complementary resources which, on their own, may be insufficient for innovation (Al-Tabbaa & Zahoor, 2024; Bockelmann et al., 2024). A robust body of empirical research shows that alliance management capabilities enhance technological innovation—often measured through patents or joint innovation outputs (Chemmanur

et al., 2023; Su et al., 2025)—and that partner diversity amplifies these positive effects (Al-Tabbaa & Zahoor, 2024). Yet, despite the proliferation of alliances in technology-intensive sectors, many fail to achieve their intended outcomes due to weaknesses in governance mechanisms and relational management practices (He et al., 2024; Su et al., 2025). Consequently, the literature has shifted from focusing solely on alliance outcomes to conceptualising alliance management capability itself as a strategic resource (Kohtamäki et al., 2018; Ratten, 2023; Vurro et al., 2024). Drawing on a sample of 200 Portuguese SMEs, this study examines alliance management as a focal construct, with dynamic capabilities (exploration and exploitation) as mediators, and technological capability, marketing capability, and new-product development (NPD) performance as outcomes. Given the growing importance of internationalisation and sustainability—particularly for SMEs—this research offers timely insights into how effective alliance management can strengthen collaborative innovation, organisational resilience, and competitive advantage (Al-Tabbaa & Zahoor, 2024; Bockelmann et al., 2024)

In this study, innovation is conceptualised in terms of firms' innovation-related capabilities, with a specific focus on new product development capability. The theoretical framework adopted in this study aligns with the IMPACT criteria for theory selection by ensuring conceptual coherence and explanatory relevance. The integration of strategic alliance management and the Dynamic Capabilities View provides internal consistency and plausibility, as both perspectives emphasise resource orchestration, inter-organisational learning, and adaptation to environmental change. The framework also demonstrates analytical strength, connectivity, and testability by linking alliance processes to technological, marketing, and innovation outcomes through validated constructs and Structural Equation Modelling.

Despite the extensive literature on strategic alliances, dynamic capabilities, and innovation, important gaps remain at the intersection of these domains. Prior studies have largely examined alliances as direct drivers of innovation outcomes or have analysed dynamic capabilities as internal firm attributes, often treating these streams in isolation. Less attention has been given to how alliance management practices translate into innovation-related capabilities through the mediating mechanisms of dynamic capabilities, particularly in SME-dominated and service-intensive contexts. Moreover, empirical evidence from peripheral EU economies remains limited, constraining the generalizability of existing theory. By integrating alliance management and dynamic capabilities within a single explanatory model and empirically testing their joint effects on technological, marketing, and new product development capabilities, this study addresses this gap and advances understanding of the capability-building mechanisms linking inter-organisational collaboration and innovation performance. Beyond providing empirical evidence, this study offers a contextual theoretical refinement of the Dynamic Capabilities View (DCV). Rather than merely testing established relationships, the model specifies how strategic alliance management operates as an external orchestration mechanism that activates dynamic capabilities, which in turn reconfigure organisational capability structures in a service-intensive SME context. The findings suggest that innovation outcomes in such environments depend less on direct technological capability and more on marketing capability development, indicating a differentiated capability configuration not sufficiently emphasised in prior DCV research. By identifying this context-contingent pathway, this study advances theory by clarifying how the DCV operates under resource-constrained and peripheral economy conditions, where alliance-based capability building becomes a primary mechanism for innovation. Although prior research acknowledges that strategic alliances can enhance firm innovation and that dynamic capabilities enable organisational adaptation, the mechanisms linking alliance management practices to the development of specific innovation-related

capabilities remain insufficiently explained. Existing studies often treat alliances as structural arrangements or focus on performance outcomes without clarifying how managerial processes within alliances translate into capability renewal, particularly in SMEs operating in service-intensive and resource-constrained environments. Moreover, the Dynamic Capabilities View has predominantly emphasised internal reconfiguration processes, leaving the role of inter-organizational governance mechanisms under-theorised. Addressing this gap, this study examines how strategic alliance management functions as an external orchestration mechanism that activates dynamic capabilities, which in turn reshape technological, marketing, and new product development capabilities. By integrating alliance governance with the DCV, this paper develops and empirically tests a model that clarifies the process through which inter-firm collaboration contributes to capability development and innovation in peripheral EU economies. This article is structured into six sections: introduction and objectives; literature review and hypotheses; conceptual framework; methodology (instrument, sample, and data procedures); empirical results and discussion; and conclusions, limitations, and implications for future research. This structure ensures conceptual rigour and highlights both theoretical and managerial contributions to the understanding of strategic alliance management.

Despite the extensive literature linking strategic alliances to innovation outcomes, existing explanations remain theoretically incomplete in two fundamental respects. First, most alliance–innovation models implicitly assume capability configurations derived from manufacturing-oriented contexts, where technological capability plays a dominant and often direct role in development. Second, prior research frequently treats alliance management either as a governance mechanism or a relational resource, without sufficiently theorising its role as an organisational capability that enables the orchestration of other capabilities over time. These assumptions are particularly problematic for service-intensive small- and medium-sized enterprises (SMEs), which represent the vast majority of firms in peripheral economies—as evidenced by our sample of 200 Portuguese firms, where 81% operate in the service sector. In such contexts, innovation relies less on standalone technological assets and more on the coordinated reconfiguration of capabilities under resource constraints.

Drawing on the Dynamic Capabilities View (DCV), this study addresses this theoretical gap by reconceptualising strategic alliance management as a higher-order organisational capability that shapes firms' dynamic capabilities. These, in turn, condition the development of technological, marketing, and new product development capabilities. By doing so, this study does not merely extend prior models to a new empirical setting, but refines the DCV by specifying how alliance management functions as an enabling mechanism for capability transformation in service-intensive SMEs. This refinement contributes to theory by clarifying the boundary conditions under which dynamic capabilities mediate the effects of inter-organisational arrangements on innovation outcomes, thereby advancing a more nuanced understanding of alliance-enabled development.

## 2. Literature Review

### 2.1. Management of Strategic Alliances

With technological advancements and increasing competition, firms are exploring new ways to enhance their business performance. One such approach is the formation of strategic alliances, aimed at sharing and exchanging resources and know-how to exploit new opportunities (Bäumle & Bizer, 2022; Kristal et al., 2010; Ryan-Charleton et al., 2022).

Strategic alliances are traditionally defined as voluntary agreements between independent firms to develop products, services, or technologies (Gulati, 1998). While this definition remains valid, recent research has expanded it by highlighting the role of alliance

management capabilities and collaborative governance mechanisms in determining alliance performance (Al-Tabbaa & Zahoor, 2024; Bockelmann et al., 2024).

Empirical studies indicate that alliance management capabilities contribute to innovation through standardised networks and top management influence (Jiang et al., 2022), while knowledge heterogeneity among partners stimulates innovative performance (Sun et al., 2022). Nonetheless, managing these alliances remains complex, particularly in diverse portfolios, as many arrangements require sophisticated governance and strategic alignment to succeed (Bockelmann et al., 2024).

Cooperation and trust between partners are also critical, especially when alliances involve repeated strategic decisions and dynamic arrangements (Tlemsani et al., 2024).

Strategic alliances can be classified into two main types: horizontal alliances, formed between competitors, and vertical alliances, involving customers, suppliers, or other stakeholders (Sluyts et al., 2011). Within horizontal alliances, downstream alliances link firms to provide access to distribution channels, marketing, and product commercialisation (Belderbos et al., 2012; Hung et al., 2015; Oliveira et al., 2021; Wassmer, 2010).

Strategic alliances can be assessed through dimensions such as alliance management capability, portfolio coordination, inter-organisational learning, alliance proactivity, and alliance transformation (Schilke, 2014).

Effective alliance management is crucial for firms to achieve competitive advantage and create value, and is thus considered a key source of alliance success (Russo, 2017). Firms engaged in strategic alliances are more likely to benefit from superior know-how, which facilitates more effective management of these partnerships (Sluyts et al., 2011).

In this context, alliance resources—understood as organisational competencies in alliance management—enable firms to capture, share, and store alliance-related know-how over time (Al-Tabbaa & Zahoor, 2024; Bouncken et al., 2022; Nasr & Al-Tabbaa, 2023).

Research demonstrates that alliance management capability contributes to more structured organisations and coordinated partner interactions, promoting continuous and efficient resource exchanges and more effective knowledge transfer processes (Kohtamäki et al., 2018; Vurro et al., 2024; Leischnig et al., 2014).

Finally, alliance management is a multidimensional construct. To evaluate it comprehensively, it is necessary to consider alliance management capability, portfolio coordination, inter-partner learning, alliance proactivity, and alliance transformation (Oliver & Goerzen, 2010).

Based on the above, Table 1 summarises the advantages and disadvantages of strategic alliances.

**Table 1.** Advantages and disadvantages of strategic alliances.

Advantages	Disadvantages
<ul style="list-style-type: none"> <li>■ Access to complementary resources and capabilities, fostering technological and market synergy;</li> <li>■ Mitigation and sharing of financial, operational, and market risks;</li> <li>■ Facilitation of inter-organisational learning and efficient knowledge transfer;</li> <li>■ Enhanced organisational flexibility and agility in response to environmental changes;</li> <li>■ Reduced transaction costs and market friction due to mutual commitment.</li> </ul>	<ul style="list-style-type: none"> <li>■ Risk of knowledge leakage and loss of proprietary information.</li> <li>■ High potential for goal divergence and managerial conflict over strategic direction.</li> <li>■ Cultural and strategic incompatibilities between partner organisations.</li> <li>■ Loss of complete operational autonomy and control over alliance activities.</li> <li>■ Increased risk of partner opportunistic behaviour and hidden agendas.</li> </ul>

Source: Own elaboration, based on (Bouncken et al., 2022; De Camargo et al., 2015; Roehrich et al., 2020; Ryan-Charleton et al., 2022).

The different types of strategic alliances are presented in Table 2.

**Table 2.** Types of strategic alliances.

Type of Alliance	Definition	Examples/Typical Purposes
Horizontal Alliances	Partnerships between firms operating in the same industry and often competing in similar markets.	Joint development of products or technologies
	<ul style="list-style-type: none"> <li>■ Sharing market intelligence;</li> <li>■ Enhancing competitive positioning;</li> <li>■ Reducing costs through scale and scope.</li> </ul>	
Downstream Horizontal Alliances ( <i>subset of horizontal</i> )	Alliances between companies aiming to access or strengthen distribution, marketing, and commercialisation channels.	Access to new distribution networks
	<ul style="list-style-type: none"> <li>■ Co-marketing initiatives;</li> <li>■ Entry into new geographic markets;</li> <li>■ Strengthening customer reach.</li> </ul>	
Vertical Alliances	Partnerships between firms in different stages of the value chain, including suppliers, customers, and other stakeholders.	Supply chain coordination
	<ul style="list-style-type: none"> <li>■ Co-development with suppliers;</li> <li>■ Improvement in production efficiency;</li> <li>■ Integration of complementary resources.</li> </ul>	

Source: Own elaboration, based on (Belderbos et al., 2012; Hung et al., 2015; Oliveira et al., 2021; Sluys et al., 2011; F. Tavares et al., 2024; Wassmer, 2010).

## 2.2. The Role of Dynamic Capability

The phenomenon of dynamic capabilities has attracted growing scholarly attention, particularly within the field of strategic management (Alkhazaleh et al., 2022). Dynamic capabilities are defined as an organisation's ability to integrate, reconfigure, renew and recreate internal and external resources in response to dynamic environments, thereby sustaining competitive advantage (Eisenhardt & Martin, 2008; Ratten, 2025; Teece et al., 1997).

Organisational capabilities, by contrast, correspond to the accumulated knowledge and competencies that firms use to acquire, deploy and leverage resources in order to achieve superior performance. Over the past decade, dynamic capabilities have gained prominence as a central construct in strategic management research (Schilke, 2014). These capabilities can be understood as organisational routines that enable firms to sense, seize and transform resources and competencies in response to changing conditions (Teece, 2017). Although dynamic capabilities are influenced by environmental dynamism, environmental turbulence is not a prerequisite for their emergence; such capabilities may also be present in relatively stable environments (Helfat & Winter, 2011). For instance, in the context of environmental or "green" transitions, organisations develop green dynamic capabilities,

defined as the firm's ability to integrate, create and reconfigure internal and external competencies to address environmental change and develop eco-friendly products or services (Lin & Chen, 2017).

Dynamic capabilities are often categorised according to two hierarchical levels: first-order capabilities relate to operational activities that ensure organisational efficiency, whereas second-order capabilities emerge when managers identify future opportunities through, for example, new product development or expansion of market share (Teece, 2017). Green dynamic capabilities may similarly enable firms to reconfigure competencies and drive green product and service innovation, contributing to new product development (Lin & Chen, 2017).

(Pitelis et al., 2024) conceptualise dynamic capabilities along two dimensions—exploratory capability and exploitative capability—reflecting the principle of organisational ambidexterity, whereby firms simultaneously pursue new opportunities while refining existing knowledge bases. Exploration strategies involve search, experimentation and the generation of new knowledge, whereas exploitation relates to efficiency-oriented activities, refinement and the extension of established knowledge (Pitelis et al., 2024; Weiss & Kanbach, 2022).

Importantly, dynamic capabilities play a decisive role in shaping the success or failure of small- and medium-sized enterprises (SMEs). To ensure sustainable growth, SMEs must therefore understand how these capabilities influence organisational processes and long-term competitiveness (Park & Kim, 2013).

It is important to distinguish between dynamic capabilities and functional (operational) capabilities, as these constructs operate at different analytical levels. Dynamic capabilities refer to higher-order processes that enable firms to sense opportunities and threats, seize them through strategic decisions, and reconfigure resource bases in response to environmental change (Teece, 2017). In contrast, marketing, technological, and new product development capabilities represent functional capabilities that support day-to-day and strategic activities within specific domains. In this study, dynamic capabilities are therefore conceptualised as meta-level mechanisms that shape, renew, and reconfigure functional capabilities rather than being equivalent to them, preserving a clear theoretical boundary consistent with the DCV.

### 2.3. Strategic Alliances and Dynamic Capabilities

This study focuses on horizontal strategic alliances, which are frequently employed in contexts characterised by high uncertainty and environmental turbulence (Kohtamäki et al., 2018). The relevance of these alliances in organisational strategy stems from their ability to enhance inter-organisational learning mechanisms, stimulate resource recombination, and promote the development of collaborative competencies. Recent research on dynamic capabilities highlights that firms that integrate, build, and reconfigure both internal and external resources demonstrate greater responsiveness to rapid changes in competitive environments (Pitelis et al., 2024; F. Tavares et al., 2024; Wilden et al., 2016). Strategic alliances thus serve as privileged mechanisms to enhance such capabilities, facilitating the coordination of activities, knowledge transfer, and access to new sources of competitive advantage (Bouncken et al., 2022; Dubey et al., 2024; Vurro et al., 2024). Well-structured alliances can contribute to the continuous strengthening of organisational capabilities and, consequently, support the sustained competitive advantage of firms over the long term.

Since strategic alliances enable the effective transfer of knowledge between partner firms, the combination of resources, and access to complex technological assets, firms may need to adapt their capabilities, leading to evolutionary adjustments and, consequently, an increase in their dynamic capabilities (Alkhazaleh et al., 2022). In this context, the

management of strategic alliances facilitates knowledge exchange between partners (De Oliveira et al., 2016) and enhances the adaptive capacity of firms (Schilke & Cook, 2013).

Strategic alliance management is conceptualised in this study as a higher-order construct because its effectiveness depends on the joint functioning of multiple, interdependent managerial processes rather than on isolated practices. Dimensions such as coordination, inter-organisational learning, proactiveness, and alliance transformation represent complementary facets of a unified capability that enables firms to govern, adapt, and leverage alliance portfolios over time. Treating these dimensions as components of a higher-order construct is therefore theoretically grounded in the view of alliance management as an integrative organisational capability, consistent with capability-based perspectives that emphasise systemic resource orchestration rather than discrete actions. This specification reflects the conceptual nature of alliance management as a holistic managerial competence and not merely an analytical aggregation.

Based on the above discussion, the following research hypothesis is proposed:

**H1.** *The management of strategic alliances has a positive effect on organisations' dynamic capabilities.*

#### 2.4. Technological Capability

A firm's technological capability refers to its proficiency in executing relevant technical functions, developing new products and processes, and operating efficiently, thereby supporting the creation of competitive advantage in environments characterised by rapid technological change (Pitelis et al., 2024). The nature of these products and services is increasingly linked to digital technologies and advanced infrastructures, which require novel combinations of knowledge and specialised expertise (Ellström et al., 2022). Strategic alliances play a pivotal role in this process by providing access to external technological resources, accelerating innovation, and expanding opportunities for entry into new markets (Guo et al., 2023).

Furthermore, investment in technology, when integrated with the development of human competencies and organisational routines, enhances the formation of robust technological capabilities aligned with the strategic needs of the organisation (Grodal et al., 2023; Guo et al., 2023; Oliveira et al., 2021). As firms strengthen their technological capabilities, their absorptive capacity increases, improving receptiveness to external exploratory knowledge and facilitating inter-organisational learning.

Technological capabilities also encompass the accumulation of technological knowledge within organisations, aimed at developing new products or improving existing ones (C.-J. Chen et al., 2014; Kyläheiko et al., 2011).

Dynamic capabilities influence firm performance, particularly in the development of technological competencies (Wilden et al., 2013). By adapting to rapidly changing environments through their dynamic capabilities, organisations are able to respond to technological opportunities and threats via innovative resources (Zaidi & Othman, 2014). In the context of small- and medium-sized enterprises (SMEs), these organisations are often more flexible and operate in volatile environments. Dynamic capabilities enable SMEs to identify their technological needs and reconfigure their technological resources accordingly (Eze et al., 2019).

Based on the above discussion, the following research hypothesis is proposed:

**H2.** *Dynamic capabilities have a positive effect on technological capabilities.*

#### 2.5. Marketing Capability

Marketing capability refers to the specialised, interfunctional and dynamic processes through which marketing resources are acquired, combined and transformed into superior

value offerings for target markets (Morgan, 2012; Vorhies & Morgan, 2005). These processes enable firms to understand current and future customer needs more accurately, supporting deeper customer insight and more effective customer acquisition (S. W. Fowler et al., 2000).

The development of marketing capability is grounded in unique and difficult-to-imitate knowledge assets, which form the basis for sustained competitive advantage (Krasnikov & Jayachandran, 2008).

Marketing capability reflects the firm's ability to differentiate its products and services, build strong brands and enhance value propositions that outperform rivals (Kotabe et al., 2012). Moreover, these capabilities facilitate the coordination of strategic activities for new product development (Kim et al., 2016), and allow organisations to respond rapidly to competitors' pricing tactics. Such responsiveness can enable cost reductions, thereby strengthening cost advantages and increasing market share (Tan & Sousa, 2015).

The literature consistently demonstrates that dynamic capabilities play a key role in strengthening marketing capability, as they enable firms to reconfigure resources, adapt to market volatility and align marketing processes with environmental changes (Mohr & Spekman, 1994; Takahashi et al., 2017; Lekakis et al., 2011).

Based on the above, the following hypothesis is proposed:

**H3.** *Dynamic capabilities have a positive effect on marketing capabilities.*

### 2.6. New Product Development Capability

Rapid technological change and intensifying competition compel organisations to develop timely and profitable new products through increasingly multidisciplinary processes shaped by digital transformation. Recent studies indicate that decision-making agility in new product development (NPD)—supported by design thinking capabilities and artificial intelligence—is critical for superior NPD performance (Kyriakopoulos et al., 2025).

Digital transformation is reshaping the dynamic capabilities required for innovation (Shan, 2023), and digital innovation capability has been shown to mediate the relationship between digital transformation initiatives and new product performance (Qiu & Chang, 2025). Moreover, organisational digital agility has emerged as a strategic advantage, enabling firms to respond rapidly to product opportunities (Duvivier & Gupta, 2023). Well-developed dynamic capabilities, combined with effective change management, further sustain successful digital projects, including NPD initiatives (Al-Moaid & Almarhdi, 2024).

Technological turbulence and competitive intensity therefore incentivise organisations to continuously develop relevant and profitable products through digitally enabled processes (D. Zhang et al., 2023). NPD not only represents a reaction to external pressures but also constitutes an important source of competitive advantage when integrated with dynamic capabilities and organisational agility (Al-Moaid & Almarhdi, 2024; Qiu & Chang, 2025). The integration of agile practices and digital resources—such as artificial intelligence and design thinking—has become essential for orchestrating technological assets and accelerating product innovation (Kyriakopoulos et al., 2025).

The success of new product initiatives ultimately depends on scarce, inimitable resources and on strategic managerial decisions regarding how these resources are combined and leveraged (Kim et al., 2016). Among these strategic resources, organisational knowledge plays a central role (C. Zhang et al., 2017). Consequently, NPD capability has been widely recognised as a critical mechanism for firm growth, improved performance and increased market share (C.-J. Chen et al., 2014).

According to Im et al. (2013), dynamic capability theory posits that organisations with strong dynamic capabilities are better able to generate new ideas and transform them into innovative products, thereby securing competitive advantages.

Based on the foregoing, the following hypothesis is proposed:

**H4.** *Dynamic capabilities have a positive effect on new product development capability.*

#### *2.7. Marketing Capability, Technological Capability and New Product Development Capability*

Building on the foregoing discussion, there is strong evidence of close interrelationships between marketing capability, technological capability, and new product development capability (NPD capability). Robust marketing capabilities—particularly when supported by digital tools and data analytics—enhance the identification of market opportunities, enable more effective segmentation, and facilitate the creation of perceived value. These mechanisms tend to improve NPD performance and increase the likelihood of successful product launches (Homburg & Wielgos, 2022; Padigar et al., 2022). Accordingly, we propose that stronger marketing competencies positively contribute to NPD capability.

From a technological perspective, recent evidence shows that the organisation of agile R&D units, together with the adoption of simultaneous engineering practices and the orchestration of digital resources, reduces development time and enhances the quality of new products (Knudsen et al., 2023; Meier & Kock, 2024).

Additionally, studies on market-entry timing in digital environments and digital capability orchestration demonstrate that firms with advanced technological design capabilities and digital transformation competencies can anticipate competitors and capture market advantages when launching innovations (X. Chen et al., 2023; D. Zhang et al., 2023). Consequently, higher levels of technological capability are expected to translate into improved NPD outcomes, both in terms of speed and product quality as well as commercial success. Thus, the following hypothesis is proposed:

**H5.** *Marketing capability has a positive effect on new product development capability.*

Furthermore, advanced technological capability—particularly when combined with digital practices such as artificial intelligence, modular platforms, and digital resource orchestration—can significantly accelerate the NPD process (Zhou et al., 2024). Corporate digital transformation also reshapes R&D activities, enabling firms to reorganise technological and human resources more rapidly in response to emerging market opportunities (Li & Zhang, 2024). In parallel, digital innovation capabilities—encompassing technology integration, agile design, and continuous learning—are fundamental for sustaining more agile and innovative product development cycles (Motamedimoghadam et al., 2025). Simultaneously, digital marketing capabilities, driven by data and analytics, enhance firms' ability to identify customer needs, improve segmentation, and anticipate trends, thereby ensuring stronger market alignment and greater success in new product introduction (Homburg & Wielgos, 2022; Padigar et al., 2022). Taken together, both marketing and technological capabilities are expected to reinforce NPD capability. Specifically, technological capability is anticipated to positively influence the development of new products. Therefore, the following hypothesis is advanced:

**H6.** *Technological capability has a positive effect on new product development capability.*

### **3. Methodology**

The constructs measured include strategic alliance management, dynamic capabilities (exploration and exploitation), technological capability, marketing capability, and new product development capability. Data analysis was conducted using Structural Equation Modelling (SEM), which allows simultaneous estimation of measurement and associative relationships among latent constructs. This method is appropriate given the model complexity and the objective of testing mediation effects. The analytical procedure fol-

lowed established SEM guidelines, including assessment of reliability, convergent and discriminant validity, and hypothesis testing through path analysis.

Given the considerations outlined in the previous sections, a questionnaire was administered to Portuguese firms in order to collect the data required to test the conceptual model, with the characteristics of the sampled organisations described subsequently. The survey instrument employed in this study was developed on the basis of measurement scales previously validated in the literature, thereby ensuring the reliability and validity of the constructs under analysis. The items were adapted from well-established instruments that have demonstrated internal consistency and methodological robustness in research on organisational capabilities and firm performance (Evans & Mathur, 2018). Marketing capabilities were measured using the indicators developed by Takahashi et al. (2017), whereas technological capability was assessed according to the scale proposed by Tzokas et al. (2015). In addition, the variables related to strategic alliances and alliance portfolios were operationalised following the model advanced by Schilke (2014), allowing for a comprehensive assessment of inter-organisational competences.

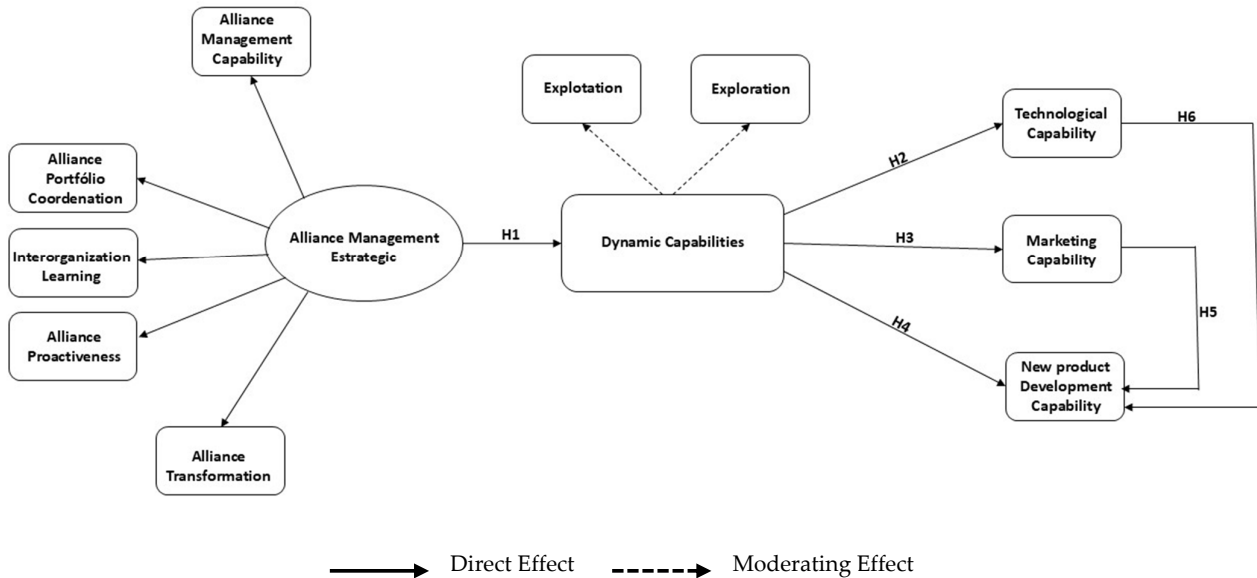
Dynamic capabilities—central to understanding the processes of resource renewal and organisational adaptation—were measured through the dimensions of exploration and exploitation, using the scales developed by Zhou et al. (2024). This approach enabled the simultaneous assessment of firms' ability to acquire new competences and deepen the utilisation of existing knowledge, both of which are essential dimensions for evaluating dynamic organisational behaviour. Finally, new product development capability was measured using the indicators proposed by Schilke (2014), ensuring conceptual alignment with the remaining constructs in this study. Taken together, the use of these validated scales strengthens the methodological rigour of the data collection instrument and aligns the study with best practices in high-quality scientific research.

The structural model was estimated using Structural Equation Modelling (SEM) in AMOS, applying the Maximum Likelihood estimation method. The mediating role of dynamic capabilities was assessed through the analysis of structural paths and the comparison between direct and total effects within the SEM framework. This approach allows for a direct evaluation of the magnitude and significance of the relationship among latent constructs. Given that all hypotheses specified directional relationships grounded in prior theory, significance was assessed based on the strength and consistency of the path coefficients ( $\beta$ ). One-tailed significance tests were employed because all hypotheses specified directional relationships grounded in prior theory on strategic alliances and dynamic capabilities, which supports the expectation of positive effects among the constructs. To address potential common method bias associated with single-respondent survey designs, several procedural remedies were implemented, including assuring respondent anonymity, reducing evaluation apprehension, and separating construct sections within the questionnaire. Additionally, a statistical assessment was conducted using Harman's single-factor test, which indicated that no single factor accounted for the majority of the variance, suggesting that common method bias is unlikely to threaten the validity of the results. Together, these steps enhance methodological transparency and mitigate concerns related to response and measurement bias.

### 3.1. Research Framework and Hypotheses

Based on the theoretical arguments developed, this study proposes a conceptual framework that identifies strategic alliance management as the primary exogenous variable, whose impact on new product development and organisational capabilities is linked through the orchestration of dynamic capabilities. In this model, the linking variable is conceptualised as a second-order construct, decomposed into the dimensions of exploration

(focusing on research, discovery, and the development of new knowledge) and exploitation (focusing on efficiency and the leverage of existing knowledge). As illustrated in Figure 1, the relationships between the higher-order construct and its constituent dimensions are represented by dashed lines, signalling its multidimensional nature, whereas solid arrows represent the direct causal hypotheses to be empirically tested.



**Figure 1.** The conceptual model framework.

### 3.2. The Questionnaire

Data were collected using a structured survey questionnaire, an approach that enables the systematic acquisition of high-volume, standardised responses in which participants indicate their level of agreement with predefined statements (F. J. Fowler, 2014; de Leeuw et al., 2012). The instrument—presented in full in the appendix and summarised—comprised seven items describing the characteristics of the firm and respondent, and forty-four statements capturing the relationships among the key constructs. Consistent with contemporary psychometric and survey research guidelines, attitudes were assessed using closed declarative statements rather than open-ended questions (Joshi et al., 2015).

Data collection occurred through both digital and face-to-face administration. The digital version, implemented in Google Forms, employed a 7-point Likert scale (Likert, 1932; Joshi et al., 2015) ranging from 1 (“Strongly disagree”) to 7 (“Strongly agree”), with intermediate options reflecting incremental levels of agreement. Respondents selected the category that best represented their position on each statement. In total, 33 online responses and 167 in-person responses were obtained.

The final sample of 200 Portuguese firms reflects the structural composition of the national business environment, which is characterised by a high density of SMEs. This sample size is considered adequate for covariance-based Structural Equation Modelling, (CB-SEM) as it exceeds the recommended thresholds relative to model complexity and number of indicators (e.g., Hair et al., 2019), thereby ensuring sufficient statistical power and model stability. Furthermore, all inconsistencies identified in previous interactions such as reporting (e.g., typographical errors in firm size categories and table labels) have been corrected to ensure accuracy and clarity in the presentation of the empirical data.

### 3.3. Sample

The sample is composed predominantly of small- and medium-sized enterprises (SMEs), defined as firms with fewer than 250 employees, an annual turnover below

€50 million, and total assets not exceeding €43 million (Instituto Nacional de Estatística, 2022).

SMEs constitute 99.9% of all Portuguese firms and account for 56.6% of national business turnover, according to 2017 data (Pordata, 2019). Given their structural importance to the Portuguese economy, the focus on SMEs is both justified and strategically relevant.

The profile of the surveyed firms is examined below, particularly regarding firm size (in number of employees), annual turnover, industrial sector, years in operation, and the number of strategic alliances established. It is important to note that several respondents chose not to disclose certain firm-level information.

### Surveyed Firms

The surveyed firms comprise 162 companies operating in the services sector, 26 in the industrial sector, and 12 for which the sector could not be identified. As shown in Table 3, 87 out of the 200 firms in the sample employ fewer than 250 workers.

**Table 3.** Number of employees in the surveyed firms by sector.

Sector					Total Number of Surveyed Firms
Number of Employees in the Surveyed Firms by Sector					
N° Employees	N° Firms	Services	Industry	Not identified	
≤less than or equal to 250.000	87	72	15		200
>250.000	27	20	6	1	
Not identified	86	70	5	11	
Total surveyed firms					200

With regard to turnover, and as shown in Table 4, 109 out of the 200 firms reported a turnover exceeding €750,000 in 2018.

**Table 4.** Turnover.

VN	Sector			
	N.º Firms	Services	Industry	Not Identified
<100,000 €	22	18	4	
100,000 €–350,000 €	9	8		1
>350,000 €–500,000 €	8	6	1	1
>500,000 €–750,000 €	7	6		1
>750,000 €–1,000,000 €	16	13	2	1
>1,000,000 €–1,500,000 €	23	19	4	
>1,500,000 €–2,000,000 €	22	15	4	3
>2,000,000 €	48	38	9	1
Not identified	45			

Of the surveyed firms, 114 (57%) had been established for more than 15 years at the time of data collection, as shown in Table 5.

**Table 5.** Age of the firms.

Firm Age (Years)	N° Firms	Sector		
		Services	Industry	Not Identified
>15 years	114	97	12	5
between 10 and 15 years	14	11	3	
between 5 and 9 years	20	16	4	
<5 years	17	16	1	
Not identified	35	22	6	7
	200			

Finally, regarding the number of strategic alliances, and as shown in Table 6, 27% of the surveyed firms reported having only one strategic alliance, predominantly within the services sector. It is noteworthy that 22% of the firms maintain more than five strategic alliances.

**Table 6.** Strategic alliances by firms and by sector.

N.° Strategic Alliances	N.° Firms	%	Services	% Services/Total Emp.	Sector		
					Industry	% Industry/Total Emp.	Not Identified
1	54	27.00%	45	83.33%	7	12.96%	2
2	25	12.50%	18	72.00%	4	16.00%	3
3	31	15.50%	25	80.65%	4	12.90%	2
4	13	6.50%	9	69.23%	4	30.77%	0
5	33	16.50%	28	84.85%	4	12.12%	1
>5	44	22.00%	37	84.09%	3	6.82%	4
	200	100.00%	162		26		12

The respondents' profile is presented below. Regarding gender, the majority of participants were female (102), followed by 93 males, while five respondents chose not to disclose their gender. In terms of age, 64 respondents were under 30 years old, 60 were aged between 30 and 40 years, 43 were between 41 and 50 years, and 23 were over 50 years old. Finally, ten individuals did not indicate their age.

Concerning educational attainment, the majority of respondents held a higher education degree, representing 36% of the total sample. Additionally, 11% possessed a postgraduate diploma, 17.5% held a master's degree, and only 1% had a doctoral degree. Regarding other educational levels, 21.5% of participants had completed secondary education, and 10% had incomplete higher education. Finally, 2.5% of respondents opted not to disclose their educational level.

## 4. Results

Amos 26.0 was used to perform CFA and SEM to test the proposed research hypotheses ( $\chi^2/df = 1.976$ ; CFI = 0.927; TLI = 0.914; IFI = 0.927; RMSEA = 0.070), meeting the established requirements for analytical robustness (Anderson & Gerbing, 1988). To address the mediation effects of dynamic capabilities, a bootstrapping procedure with 5000 resamples was performed. The results indicate that the structural model is statistically significant, providing a robust framework for hypothesis testing. Table 12 presents the standardised regression weights ( $\beta$ ) and significance levels for each path. Specifically, the relationship between strategic alliance management and dynamic capabilities was confirmed ( $\beta = 0.60$ ,  $p < 0.001$ ), supporting H1. However, the direct path from technological capability to new product development (H6) did not reach statistical significance ( $\beta = 0.14$ , n.s), providing empirical evidence of specific boundary conditions within the context of Portuguese service-based SMEs.

### 4.1. Descriptive Analysis of Variables

The following table presents the descriptive statistics of the variables.

As presented in Table 7, responses for each construct ranged from the minimum value of 1 to the maximum value of 7 on the scale. In terms of mean scores, NPD—new product development recorded the highest values, followed by DCET—dynamic capability (exploitation). The remaining constructs exhibited responses predominantly between levels 4 and 5, corresponding to “Neither agree nor disagree” and “Agree,” respectively.

**Table 7.** Descriptive statistics table.

	N	Minimum	Maximum	Mean	Standard Error
MC	200	1.00	7.00	4.7775	1.50907
TC	200	1.00	7.00	4.9713	1.56641
AEC	200	1.00	7.00	4.7162	1.65996
AEP	200	1.00	7.00	4.6038	1.61636
AEA	200	1.00	7.00	4.8112	1.63475
AEPA	200	1.00	7.00	4.5637	1.70776
AET	200	1.00	7.00	4.4917	1.64184
DCE	200	1.00	7.00	4.8110	1.56034
DCET	200	1.00	7.00	5.0670	1.53790
NPD	200	1.00	7.00	5.1325	1.46545

Note. The descriptive statistics were calculated based on a sample size of N = 200 firms. All constructs were measured using a 7-point Likert scale, where 1 = Strongly disagree and 7 = Strongly agree. MC: marketing capability; TC: technological capability; AEC: alliance management capability; AEP: alliance portfolio coordination; AEA: Strategic Alliances—Interorganizational Learning; APEA: Strategic Alliances—Alliance Proactivity; DCE: dynamic capability—exploration; DCET: dynamic capability—exploitation; NPD: new product development.

### 4.2. Exploratory Analysis

As described of the pre-test, an exploratory analysis was conducted on the data obtained from the 200 surveyed firms. According to Table 8, all indices fall within the acceptable thresholds reported in the literature, indicating that there are no data-related issues. Consequently, the analysis proceeds to the estimation of the structural equations within the confirmatory exploratory analysis.

**Table 8.** Variable composition, Cronbach's Alpha, KMO, Bartlett's test, and correlation.

Variable	Name	No. of Items	Items	>0.8 Cronbach's Alpha	>0.25 Item Correlation	>0.7 KMO	0 Bartlett's Test	1 No. of Dimensions	>0.6 % of Variance Explained
MC	Marketing Capability	6	MC1 MC2 MC3 MC4 MC5 MC6	0.942	0.723	0.899	0.000	1	77.89%
TC	Technological Capability	4	TC1 TC2 TC3 TC4	0.950	0.74	0.83	0.000	1	86.99%
AEC	Strategic Alliances—Alliance Management Capabilities	4	AEC1 AEC2 AEC3 AEC4	0.961	0.636	0.846	0.000	1	89.69%
AEP	Strategic Alliances—Alliance Portfolio Coordination	4	AEP1 AEP2 AEP3 AEP4	0.947	0.646	0.833	0.000	1	86.82%
AEA	Strategic Alliances—Inter-organisational Learning	4	AEA1 AEA2 AEA3 AEA4	0.950	0.725	0.785	0.000	1	87.23%
AEPA	Strategic Alliances—Alliance Proactiveness	4	AEPA1 AEPA2 AEPA3 AEPA4	0.971	0.683	0.885	0.000	1	92.13%
AET	Strategic Alliances—Alliance Transformation	3	AET1 AET2 AET3	0.904	0.74	0.678	0.000	1	84.13%
DCE	Dynamic Capability—Exploration	5	DCE1 DCE2 DCE3 DCE4 DCE5	0.944	0.735	0.85	0.000	1	81.94%
DCET	Dynamic Capability—Exploitation	5	DCET1 DCET2 DCET3 DCET4 DCET5	0.975	0.734	0.889	0.000	1	90.96%
NPD	New Product Development Capability	4	NPD1 NPD2 NPD3 NPD4	0.889	0.809	0.79	0.000	1	75.29%

Note. N = 210. KMO (Kaiser–Meyer–Olkin): measure of sampling adequacy; Bartlett's test of sphericity  $\chi^2(df, 190) = 4578.43, p < 0.001$ . All items loaded above 0.50 on their respective latent variables. Inter-construct correlations are shown below the diagonal.

#### 4.3. Confirmatory Factor Analysis: Structural Equations

This section is based on the work of (Lisboa et al., 2012). Before explaining the method, it is necessary to understand the distinction between exogenous and endogenous variables.

A variable is considered exogenous when it does not depend on other variables and is not explained through relationships established in the model formulation. En-

dogenous variables, on the other hand, are dependent on at least one relationship in which they appear and are explained, either directly or indirectly, by exogenous or other endogenous variables.

The Structural Equation Model (SEM) comprises the measurement model and the structural model. The measurement model corresponds to the links between latent variables and observable variables, which are used to measure the latent constructs. The structural model, in contrast, represents the causal relationships between latent variables. To evaluate the measurement model, one should assess the reliability of each indicator (individual-item reliability), the reliability of the latent variables, the Average Variance Extracted (AVE), and discriminant validity.

Firstly, the quality of measurement for each indicator linked to the latent variable is assessed; multiple correlation coefficients greater than 0.2 indicate sufficient indicator reliability. Secondly, the reliability of latent variables is evaluated using Composite Reliability, with values greater than 0.7 indicating acceptable reliability. Thirdly, the Average Variance Extracted (AVE) is examined, which measures the proportion of variance in the indicators explained by the latent variable. An AVE above 0.5 is considered acceptable.

Finally, discriminant validity is assessed. A latent variable demonstrates discriminant validity when the correlations among its indicators are significantly higher than the correlations between these indicators and those of other latent variables. To confirm this, the squared correlation between latent variables is compared to the AVE of each latent variable; discriminant validity is established if the squared correlation is lower than the AVE of the respective latent variables.

The measurement model is presented in the following figure (Figure 2):

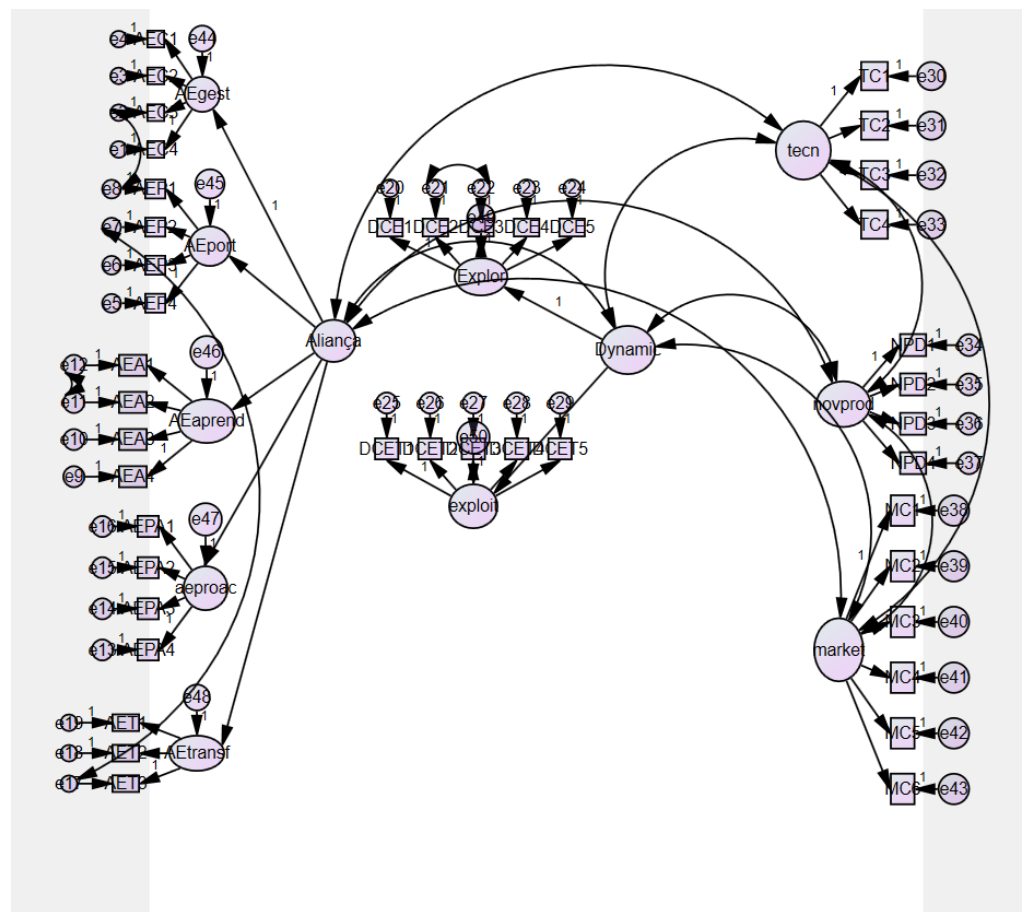


Figure 2. Measurement model.

Considering the data presented in Table 9, it is evident that the correlations between the variables exceed 0.2, indicating satisfactory individual-item reliability. Moreover, the Composite Reliability (CR) values surpass 0.7, confirming the reliability of the latent constructs. The Average Variance Extracted (AVE) also exceeds 0.5, further supporting construct validity. Discriminant validity is likewise established, as the squared correlations between latent variables are lower than the respective AVE values for each construct, as shown in Table 10.

**Table 9.** Variable correlations, AVE, and CR.

	DP	Technological Capability	New Product Development	Marketing Capability	Strategic Alliances	Dynamic Capability	AVE	CR
Technological Capability	1.584298	0.946					0.816	0.947
New Product Development	1.50333	0.447	0.87				0.756	0.925
Marketing Capability	1.494323	0.603	0.603	0.906			0.619	0.907
Strategic Alliances	1.534927	0.595	0.486	0.658	0.969		0.904	0.979
Dynamic Capability	1.273185	0.72	0.667	0.714	0.706	0.927	0.839	0.912

Note. AVE: Average Variance Extracted. CR: Composite Reliability. The diagonal elements display the standard deviations (DP) of the latent constructs. CR values above 0.70 indicate satisfactory internal consistency reliability. AVE values above 0.50 indicate satisfactory convergent validity. Off-diagonal elements show the inter-construct correlations (Pearson's  $r$ ).

**Table 10.** Key indices for evaluating the measurement model.

Model Fit Index	Measurement Model (Result)
IFI (Incremental Fit Index)	0.927
TLI (Tucker–Lewis Index)	0.921
CFI (Comparative Fit Index)	0.927
RMSEA (Root-Mean-Square Error of Approximation)	0.070
$\chi^2/DF$	1.976

Note. The measurement model was assessed using the Maximum Likelihood estimation method,  $N = 200$ . CFI: Comparative Fit Index; TLI: Tucker–Lewis Index; IFI: Incremental Fit Index; RMSEA: Root-Mean-Square Error of Approximation;  $\chi^2/DF$ : ratio of Chi-square to degrees of freedom.

Dynamic capabilities were modelled as a higher-order construct composed of the two first-order dimensions, exploration and exploitation. In line with the literature on dynamic capability, these dimensions represent distinct yet complementary capability domains that jointly form the broader dynamic capability construct; therefore, the higher-order specification was treated as formative, while the first-order dimensions were modelled reflectively. This specification is theoretically justified because exploration and exploitation capture different organisational processes whose combined presence defines the overall level of dynamic capability rather than reflecting a single underlying latent phenomenon. Consequently, the higher-order construct was evaluated considering formative measurement principles, while reliability and validity assessments were conducted at the first-order level. This higher-order specification reflects the theoretical assumption that alliance management operates as a unified capability composed of distinct but complementary dimensions.

#### 4.4. Structural Model

##### Model Fit

Following the specification and identification of the model, estimation was conducted using SPSS Statistics version 28.0, AMOS software version 28.0 with the Maximum Likelihood method.

Several indices are employed to evaluate the overall fit of the model to the data, assessing whether the formulated model adequately represents the sample data. These indices are categorised into three groups: absolute fit measures, incremental fit measures, and parsimony fit measures (Lisboa et al., 2012).

Absolute fit measures assess whether the observed covariance matrix matches the estimated matrix. Initially, the Chi-square test is considered; a statistically significant result indicates a discrepancy between the matrices. However, this test is sensitive to sample size, deviations from multivariate normality, the number of indicators used to measure latent variables, and model complexity. Complementary indices include the Goodness-of-Fit Index (GFI) and Adjusted Goodness-of-Fit Index (AGFI), which should exceed 0.9; the Root-Mean-Squared Error of Approximation (RMSEA), which should be below 0.08 (excellent if below 0.03); and the Standardised Root-Mean-Square Residual (SRMR), with values below 0.08 considered acceptable.

Incremental fit measures compare the null model with the specified model. These include the Tucker–Lewis Index (TLI), Comparative Fit Index (CFI), and Incremental Fit Index (IFI). Values above 0.9 indicate acceptable global fit.

Parsimony fit measures allow comparison of models with different complexity levels. A commonly used index is the relative Chi-square (Chi-square/degrees of freedom), with values below 2 indicating reasonable fit. It should be noted that a single index falling below the reference value does not, by itself, imply inadequate model fit.

Based on Table 11 IFI, TLI, and CFI values exceed 0.9, indicating acceptable global fit. RMSEA is below 0.08, and the relative Chi-square is below 2. The measurement model (Table 11) also presents acceptable values. Accordingly, the analysis of the model hypotheses can proceed.

**Table 11.** Key indices for evaluating the structural model.

FIT Global	Structural Model (Result)
IFI (Incremental Fit Index)	0.926
TLI (Tucker–Lewis Index)	0.920
CFI (Comparative Fit Index)	0.926
RMSEA (Root-Mean-Square Error of Approximation)	0.070
$\chi^2/DF$	1.986

Note. The structural model fit statistics are reported. CFI: Comparative Fit Index; TLI: Tucker–Lewis Index; IFI: Incremental Fit Index; RMSEA: Root-Mean-Square Error of Approximation;  $\chi^2/DF$ : ratio of Chi-square to degrees of freedom.

#### 4.5. Hypothesis Testing

Following the evaluation of the structural model and the measurement model, the following relationships were observed within the structural model (Figure 3):

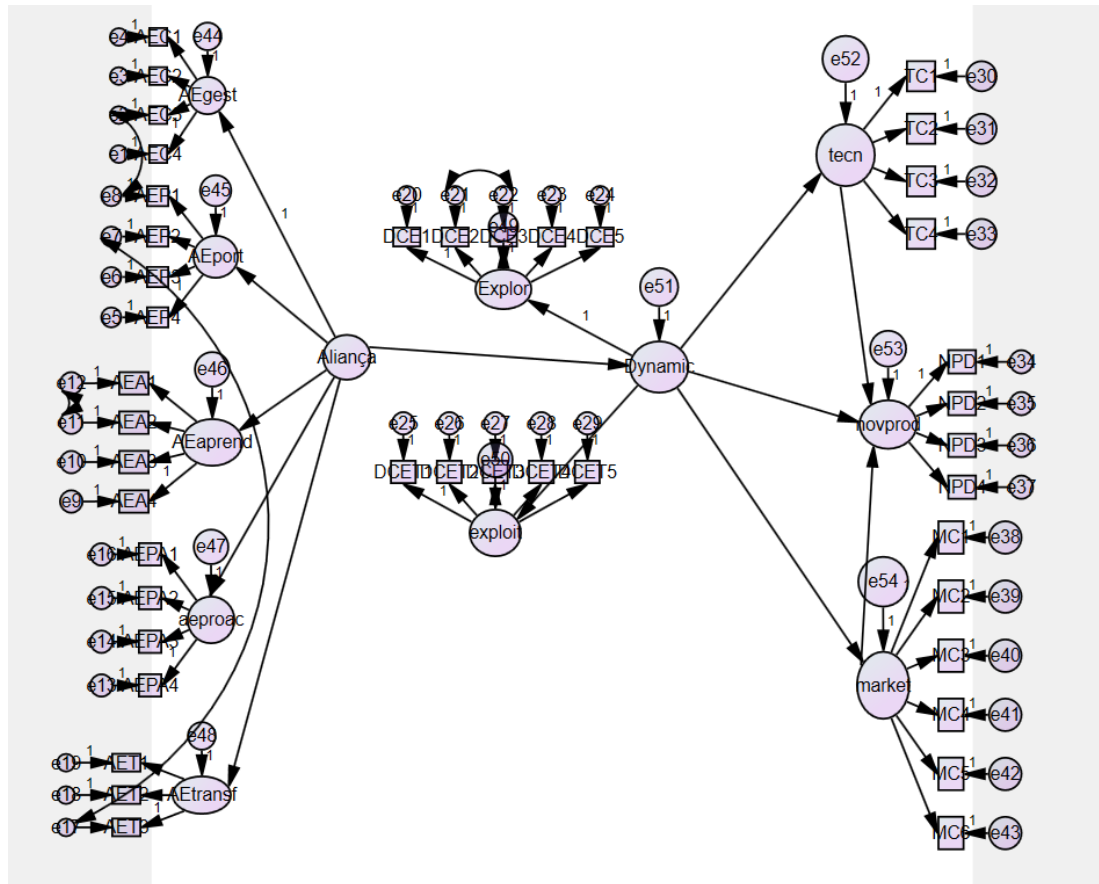


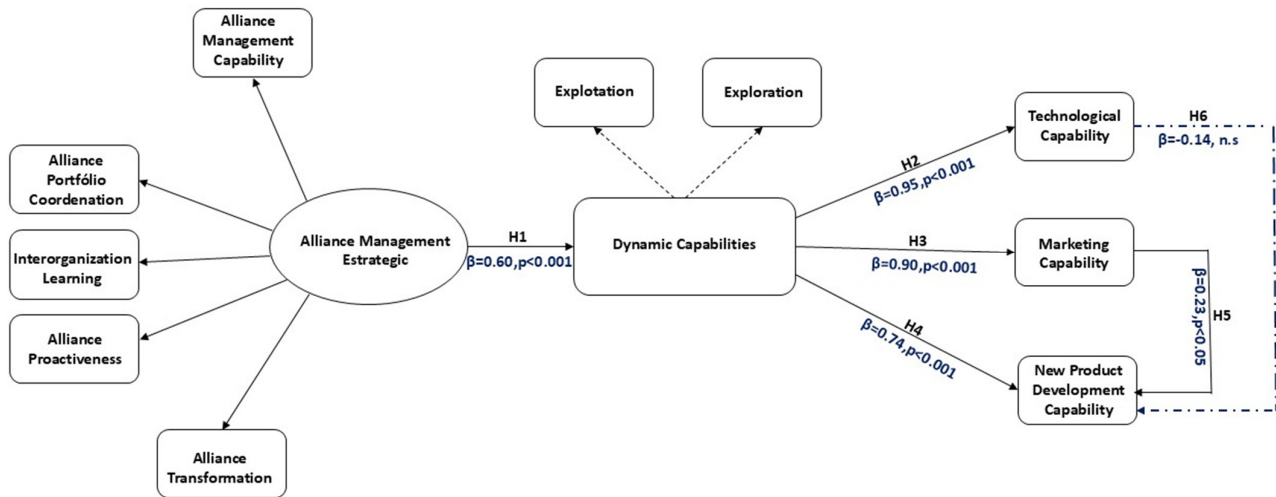
Figure 3. Structural model.

Within this model, the SRW and *p*-values are reported, serving to support or refute the hypotheses outlined in the literature review chapter, as presented in Table 12 and Figure 4. The following section provides a detailed analysis of each hypothesis.

Table 12. Structural equation results.

				SRW	<i>p</i>	Statistical Test	Corroborated (C)?
Strategic Alliances	→	Dynamic Capabilities	H1	0.604	***	***	C
Dynamic Capabilities	→	Technological Capability	H2	0.952	***	***	C
Dynamic Capabilities	→	Marketing Capability	H3	0.904	***	***	C
Dynamic Capabilities	→	New Product Development	H4	0.739	***	***	C
Marketing Capability	→	New Product Development	H5	0.232	0.023	***	C
Technological Capability	→	New Product Development	H6	−0.142	0.123	N.S.	N.C.

\*\*\* *p* < 0.01; n.s.: *p* > (one tailed test); supported hypothesis → corroborate (significant path; *p* < 0.05); unsupported hypothesis → not supported (N.S.) (non-significant path; *p* ≥ 0.05). Note: C = corroborated (hypothesis/data supported); N.C. = not corroborated (hypothesis/data not supported).



**Figure 4.** Final structural model. Based on conceptual framework. Note: n.s. = not significant at the 0.05 level.

#### H1. Strategic Alliance Management → Dynamic Capability:

Empirically supported. The path coefficient is positive and significant ( $\beta = 0.60$ ,  $p < 0.001$ ), indicating that the Management of Strategic Alliances effectively enhances the dynamic capability of the sampled firms.

#### H2. Dynamic Capability → Technological Capability:

Validated. Consistent with the model's predictions, dynamic capability exerts a strong positive influence on technological capability ( $\beta = 0.95$ ,  $p < 0.001$ ).

#### H3. Dynamic Capability → Marketing Capabilities:

Corroborated. The results confirm that dynamic capability is a critical antecedent to marketing capability ( $\beta = 0.90$ ,  $p < 0.001$ ).

#### H4. Dynamic Capability → New Product Development (NPD) Capability:

Statistical evidence confirmation. Dynamic capability significantly contributes to the enhancement in new product development (NPD) Capability ( $\beta = 0.74$ ,  $p < 0.001$ ).

#### H5. Marketing Capability → New Product Development (NPD) Capability:

Supported. Marketing capability has a positive and significant impact on NPD capability, although with a lower magnitude compared to dynamic capabilities ( $\beta = 0.23$ ,  $p < 0.05$ ).

#### H6. Technological Capability → New Product Development Capability:

Not supported. The relationship between technological capability and NPD Capability was found to be non-significant ( $\beta = -0.14$ , n.s.), in this specific sample of Portuguese service-based SMEs.

## 5. Discussion

The results obtained through Structural Equation Modelling (SEM) confirm the robustness of the theoretical model, presenting a parsimonious fit index CMIN/DF of 1.986. This value, situated below the rigorous threshold of 2.0, indicates that the model structure adequately represents the reality of the Portuguese SMEs analysed. Although absolute fit indices such as the GFI present more conservative values due to the high complexity of the model ( $df = 843$ ), the consistency of the incremental indices (CFI = 0.926 and TLI = 0.926) supports the validity of the inferences and the reliability of the estimated structural paths. The analysis reveals that, for Portuguese SMEs, resources based on alliances do not automatically lead to superior performance. Instead, the results underscore that dynamic capabilities (DCET) establish the critical link between the exogenous variable (strate-

gic alliance management) and the endogenous variables (marketing, technological, and NPD capabilities).

The significant path coefficients observed, with a range of ( $\beta = 0.60, p < 0.001$ ), confirm that dynamic capabilities act as the essential engine that converts external cooperation into tangible internal organisational strengths. This statistical evidence exposes a critical boundary condition in the service sector: technology insulation is insufficient to drive New Product Performance (NPD). This is corroborated by the fact that the direct path of technological capability failed to reach statistical significance ( $\beta = 0.14, n.s$ ), while marketing capability maintained a positive and significant impact ( $\beta = 0.23, p < 0.05$ ). Mathematically, this suggests a total near-total mediation by dynamic capabilities regarding the technological aspect.

In other words, external technical knowledge is only transformed into innovation results when filtered through the company's adaptative process. In short, the structural link identified in the AMOS data reinforces that competitive advantage does not reside in the possession of resources (alliances or technology), but in the ability need to orchestrate those assets. The model proves that dynamic capabilities are the missing link that allows SMEs to transform collaborative networks into sustainable market performance.

These findings contribute to a contextual refinement of the Dynamic Capabilities View (DCV). While DCV research frequently posits technological capability as the primary driver of innovation, our results indicate that in the specific context of Portuguese service-intensive SMEs—which constitute the majority of our sample (81% service sector; 43.5% with fewer than 250 employees)—innovation outcomes are more robustly associated with marketing capability development mediated by dynamic capabilities. In a peripheral economy characterised by small service companies, the results validate the influence of dynamic capabilities on the development of specific functional competencies. In line with (Wilden et al., 2013) and (Chiambaretto & Fernandez, 2016), we found that greater agility in responding to change—facilitated by alliances—directly enhances technological and marketing capabilities. In the context of SMEs, these dynamic routines allow managers to identify technological needs and reconfigure resources effectively (Eze et al., 2019), while improving their understanding of customer needs (Protogerou et al., 2012; Takahashi et al., 2017).

### *Theoretical Implications*

This study offers several theoretical implications for the literature on strategic alliances, dynamic capabilities, and the vision (DVC). First, the findings demonstrate that alliance management should be understood not merely as a simple transactional, relational, or governance function. By modelling alliance management as a multidimensional construct, this research highlights its role in the perception and reconfiguration of external knowledge, and as an integrative organisation capability. By modelling strategic alliance management as a higher-order construct, this research highlighted its role in the perception and reconfiguration of external resources, expanding previous conceptualizations that treat alliances primarily as transactional activities. This is aligned with (Schilke, 2014), who posits that alliance management is a specific dynamic capability comprising routines that modify a company's resource base. Based on recent contributions from (Ferreira et al., 2021), we interpret the mediating role of dynamic capability through the lens of exploration and exploitation routines. The results provide empirical evidence for the mediating role of exploration and exploitation. Alliances act as a vehicle for companies to pursue and balance these two types of learning. Our results confirm that, for service-focused SMEs, the impact of alliances is not a direct "plug-and-play" effect. Instead, the success of innovation depends on this ambidextrous ability to explore new horizons and leverage current strengths.

The high path coefficients found in our model ( $\beta = 0.95$  for technological capability and  $\beta = 0.90$  for marketing capability) suggest that these dynamic routines are the main filters that prevent the waste of knowledge acquired through alliances, ensuring that it is directed towards functional competencies.

Thirdly, the non-significant direct relationship between technological capability and NPD(H6) offers a critical refinement to the DCV regarding boundary conditions. In the context of Portuguese SMEs with a strong presence in the services sector, technological assets proved insufficient as direct drivers of innovation. This suggests that, in these environments, technology operates under a regime of total mediation; it only materialises into innovation when filtered by the company's adaptive routines—specifically, marketing and dynamic capabilities. This finding supports the idea that the value of dynamic capabilities depends on the industry context (services versus manufacturing) and the company's ability to orchestrate these assets, rather than simply possessing them. Taken together, this implication shifts the focus from the logic of resource ownership to the logic of orchestration, by integrating the exploration/exploitation framework of (Ferreira et al., 2021) with the contingency perspective of (Schilke, 2014). Specifically, our model distinguishes between direct structural paths and moderating effects (represented by the dashed lines in our framework). This distinction is crucial: it reveals that while alliances provide the raw material for innovation, their ultimate success is moderated by the firm's ability to balance exploratory and exploitative routines. This study positions strategic alliance management as a foundational dynamic capability, indispensable for SMEs operating in resource-constrained, service-oriented economies.

Taken together, these implications advance a configuration-oriented understanding of alliance-enabled innovation, positioning strategic alliance management as a foundational capability for service-intensive SMEs.

## 6. Conclusions

The objective of this study was to evaluate how the management of strategic alliances influences technological, marketing, and new product development (NPD) capabilities in Portuguese companies. The structural model was designed to position dynamic capabilities (exploration and exploitation) as the central link: endogenous variables in relation to alliance management and exogenous variables in relation to functional capabilities and NPD.

The results obtained through Structural Equation Modelling (SEM) indicate that alliance management exerts a positive and direct effect on dynamic capabilities. These, in turn, function as a structural conversion mechanism, strengthening marketing competencies and new product performance. A key finding lies in the configuration of these pathways: while dynamic capabilities directly drive NPD, technological capability did not show a significant direct effect on NPD (H6). This suggests that, in the service sector in Portugal, technology is a resource that needs to be processed by the organisation's dynamic routines to generate value, not producing innovative results in isolation.

### 6.1. Theoretical Contributions

The main theoretical contribution of this study lies in the validation of a chain of structural effects that positions alliance management as an antecedent of dynamic capabilities. By integrating the exploration and exploitation framework of Ferreira et al. (2021), this work demonstrates that the success of innovation depends on how the company organises these capabilities as pivotal variables in the model.

Unlike simplistic views, our results support Schilke's (2014) contingency perspective, demonstrating that the effectiveness of each structural path (direct or moderating, as

represented by the solid and dashed lines in the model) depends on the industrial context. The absence of a direct effect of technology on NPD (H6) reinforces the theory that, in service economies, the capability structure requires market-oriented orchestration, and not just the accumulation of technological assets.

This study extends the Dynamic Capabilities View by demonstrating how alliance management operates as an upstream governance mechanism that activates dynamic capabilities, rather than as a direct driver of innovation outcomes. By showing that dynamic capabilities mediate the relationship between alliance management and functional capabilities in a service-intensive SME context, the findings refine prevailing assumptions derived mainly from manufacturing-based settings. In doing so, this study contributes a contextualised explanation of capability configuration and sequencing in peripheral European economies, thereby advancing the boundary conditions of the DCV.

### 6.2. Managerial and Methodological Implications

From a practical point of view, leaders of Portuguese SMEs must understand that strategic alliances are the starting point for fuelling exploration (seeking new knowledge) and exploitation (efficiency in current knowledge) routines. Given that the strongest structural path to innovation lies in dynamic and marketing capabilities, investment should be prioritised in organisational agility and market intelligence, rather than focusing exclusively on technology acquisition.

Methodologically, the study establishes the relevance of testing models where dynamic capabilities assume this dual role (endogenous/exogenous), allowing the identification of flaws in traditional paths (such as the technological one) that are often taken for granted in the manufacturing literature, but which are not confirmed in the service sector.

From a managerial perspective, the findings suggest that SME managers should invest in formal alliance governance mechanisms and relational coordination practices that deliberately foster dynamic capabilities, such as learning, resource reconfiguration, and cross-partner knowledge integration. For policymakers, the results highlight the importance of supporting collaborative programmes and network-based initiatives that help SMEs develop alliance management capabilities as a pathway to sustained innovation and competitiveness in service-intensive economies.

## 7. Limitations and Future Research

This study presents several limitations that must be explicitly acknowledged to contextualise the findings and guide future scholarly inquiry.

First, the composition of the sample—predominantly comprising firms from the services sector—may restrict the broader generalisability of the results. While this provided a unique opportunity to refine the Dynamic Capabilities View (DCV) in service-intensive contexts, future research should include a larger proportion of manufacturing firms. This would allow for a comparative analysis to determine if the non-significant path between technological capability and NPD (H6) is a sector-specific boundary condition or a broader characteristic of the Portuguese SME landscape.

Second, the model positioned dynamic capabilities—specifically through the lenses of exploration and exploitation (Ferreira et al., 2021)—as a central structural link. However, the study did not explicitly consider the longitudinal evolution of these routines. Since dynamic capabilities are path-dependent, future research could employ longitudinal designs to capture how the balance between exploration and exploitation shifts as alliances mature and the external environment changes (Schilke, 2014)

Third, a significant avenue for future research lies in exploring the “micro-foundations” of dynamic capabilities by examining the individual characteristics of SME decision makers.

Specifically, the role of financial literacy—as reframed for the modern era by (F. O. Tavares & Almeida, 2025)—could provide a novel perspective on how managers navigate digital transformations and sustainable empowerment. Investigating whether higher levels of financial literacy enable entrepreneurs to better evaluate the risk–return trade-offs in strategic alliances would bridge the gap between financial competence and strategic agility. This is particularly relevant given that the orchestration of exploratory routines requires not only strategic vision but also the financial empowerment to sustain long-term innovation pathways (F. O. Tavares & Almeida, 2025).

Fourth, although this study robustly examines the relationship between alliances and functional capabilities, it did not fully incorporate emerging dimensions such as environmental sustainability. Given the increasing pressure for corporate accountability and sustainable empowerment, future research should analyse how collaborative networks facilitate the development of “green” dynamic capabilities and sustainable products.

Methodologically, while this study relies on Structural Equation Modelling (SEM) to confirm the proposed framework, future research could benefit from integrating predictive methodologies. Data mining techniques, for instance, offer a viable pathway to identify complex relationship patterns and establish alliance typologies that are not easily captured by the confirmatory nature of SEM (Avelar et al., 2017).

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**Informed Consent Statement:** Informed consent was obtained from all subjects involved in the study.

**Data Availability Statement:** Data available on request.

**Conflicts of Interest:** The authors declare no conflicts of interest.

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