The Role of Strategic Partnerships in the Growth of Biotech Startups

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ABSTRACT

This thesis addresses the extent to which strategic partnerships contribute to the growth trajectories of biotech startups. Prior research has mostly targeted internal resources, but the power of external partnerships is relatively unexplored. Employing a qualitative methodology, this research draws on semi-structured interviews with executives in biotech startups from diverse growth stages. The paper shows that product development is facilitated by R&D partnerships during the early growth stage, while collaborations with pharmaceuticals, regulatory authorities, and investors in the later stages are essential for commercialization and scaling. Partnership intensity also proves significant, with intense partnerships leading to better scaling.

By integrating the Resource-Based View (RBV) and Dynamic Capabilities View (DCV), this research broadens the scope of growth trajectory models by adding external partnerships. The findings present a new typology of "partnership-driven growth paths" and offer recommendations for biotech entrepreneurs and investors on maximizing partnership strategies. This research highlights the critical role that strategic partnerships play in challenges and growth in the biotech industry.

During the preparation of this work, the author used ChatGPT in order to translate data content. After using this tool/service, the author reviewed and edited the content as needed and takes full responsibility for the content of the work.

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1. Introduction

1.1 Context and importance

Biotech startup companies exist within uncertain environments where they encounter long development times and challenges with resource procurement. These companies often face high technological uncertainty combined with long processes for regulatory approval and capital needs(Pisano, 2006; Powell et al., 1996). Compared to other startups, biotech companies tend to require extensive external assistance to navigate regulatory hurdles and achieve a successful market launch.

The complexity of product development, clinical trials, and the approval processes that were mentioned previously, asks for external partnerships with regulators, pharmaceutical companies and research institutions(McKelvie & Wiklund, 2010; Powell et al., 1996). Strategic decision-making centered on internal and external resource acquisition is therefore crucial for their survival and growth. Current research extensively explores the role that internal resources, such as human and technological capital, play. However, due to the capital-intensive nature of the biotech industry, financial resources are often secured externally through venture capital, strategic partnerships, or public funding (Göttel et al., 2024).

1.2 Problem Statement

Prior studies, such as Göttel et al. (2024), have offered frameworks that categorize biotech startups into different growth trajectories, such as early failure, steady growth, growth reversal, and moderate scaling. Still, these frameworks focus predominantly on internal resource dynamics. Moreover, external strategic partnerships, which could improve a startup's access to markets, technology, credibility, and resources, are largely absent from existing growth trajectory models.

1.3 Research Objective

This research aims to extend the existing growth trajectory models by investigating the role of strategic partnerships. By focusing on timing, type, and intensity dimensions, this study attempts to uncover how external partnerships facilitate or disrupt the growth trajectories.

The research merges the Resource-Based View (RBV) with the Dynamic Capabilities View (DCV) to evaluate how partnerships open up essential resources for startups and how they equip them in dealing with challenges (Teece, Pisano, & Shuen, 1997). The findings then add insight for growth theories, offer useful advice for biotech entrepreneurs and investors, and potentially broaden growth trajectory models through an examination of the impact that strategic partnerships have. The research findings could then be applied as recommendations, aiding entrepreneurs in making partnership decisions based on their biotech startup's maturity and their overall strategy. (Wernerfelt, 1984; Göttel et al., 2024)

The thesis provides an original contribution by identifying the importance of partnership during various growth phases of biotech startups. Although previous research has considered partnership as an element of general startup growth, there is not enough focus on how partnership intensity, type, and timing interact with the specific technological and resource dependencies of the biotech startups. Applying insights from the Resource-Based View (RBV) and the Dynamic Capabilities View (DCV), this research presents a finer-grained understanding of the ways in which partnership structures can support or undermine growth. This viewpoint contributes to a more nuanced theoretical approach to the understanding of growth trajectories of biotechs.

1.4 Research Question

In what ways do the timing, type, and intensity of strategic partnerships shape the growth trajectories of biotech startups?

Sub-Questions

- How does the timing of strategic partnerships affect different growth stages?
- What types of partnerships are most influential at various growth stages?
- How does the intensity of partnership engagement relate to success or failure in biotech startups?

1.5 Structure of the Thesis

Chapter 2 reviews the relevant literature on startup growth trajectories, internal versus external resource perspectives, and the role of partnerships. Chapter 3 outlines the qualitative research methodology that was employed. Chapter 4 presents the findings based on the data gathered from the interviews, which were then structured using the Gioia Method. Chapter 5 then discusses the implications, contributions, limitations, and suggestions for future research.

2. Literature Review

2.1 Growth Trajectories of Biotech Startups

Biotech startups typically experience varying development paths (Göttel et al., 2024) provides a framework that categorizes them as either early failure, steady growth, growth reversal, or moderate scaling. Furthermore, these categorizations relate to internal capacities like financial management, talent acquisition, and innovation potential. In addition to these internal capabilities, the biotech sector is exposed to higher risks compared to other industries(Pisano, 2006; Audretsch & Stephan, 1996).

The framework highlights how internal resources configuration and critical points in decision-making determine long-term survival and growth opportunities. This aligns with McKeelvie and Wiklund (2010), because in their paper, it is emphasized that the mechanisms that companies use to grow are more important than the growth itself. This argument supports the idea of examining how strategic partnerships may shape growth rather than just measuring the outcomes. However, external drivers such as strategic partnerships can affect these paths in volatile and resource-limited environments. Strategic partnerships can provide benefits such

as risk-sharing, access to complementary technology, and even enhanced credibility for biotech firms. This implies the necessity of incorporating both internal and external drivers of growth into analytical models.

2.2 Strategic Partnerships and Their Role in Biotech Startup Growth

While Göttel et al. (2024) emphasize the importance of internal resources, this study integrates strategic partnerships as a potential key external driver of growth. By including external partnerships, this research builds upon their framework to offer a more comprehensive view of startup growth trajectories.

This framework outlines four critical growth stages:

Early Failure :
Early partnerships can be perceived as a path to Growth. In this context, Early-stage R&D partnerships could potentially prevent failure by providing essential resources such as funding, technology, and expertise.(Barden, 2012)

Steady Growth :
As companies progress toward commercialization, their needs for partners tend to progress too. The focus shifts from R&D partners to partnerships with pharmaceutical companies and investors because they can better enable scaling and market access. (Ambos & Birkinshaw, 2010)

Growth Reversal :
Startups that are in the growth reversal stage usually fail to form strategic partnerships at pivotal moments. Failing to secure pharmaceutical or investor partnerships can then restrict access to markets and capital, which results in contraction.(Es-Sajjade et al, 2020)

Moderate Scaling :
High-Intensity Partnerships are considered to be suitable for Sustainable Growth; therefore, as startups grow, they often require high-intensity partnerships that involve deeper collaboration, such as joint ventures, long-term commitments, and resource-sharing with pharma companies, investors, and regulatory bodies.(Clarysse et al., 2014)

By including the dynamics of strategic partnerships into Göttel et al. (2024)'s model of growth trajectory, this research can present a more complete picture of the driving forces of biotech startup success by combining internal and external dynamics in one cohesive perspective on growth trajectories.

While many studies highlight the benefits of partnerships for growth (Barden, 2012; Ambos & Birkinshaw, 2010), some warn that partnerships may create challenges that can eventually hinder growth such as the startup becoming dependent on the partners and strategic missalignment (Es-Sajjade et al., 2020; Prashant & Harbir, 2009).

This shows, in contrast, that external partnerships can be both assets and liabilities, which makes their role in biotech growth highly context-dependent.

2.3 Internal Resources and the Resource-Based View (RBV)

The Resource-Based View (RBV) states that firms can gain a competitive advantage by creating valuable, rare, imitable, and non-substitutable resources. Similarly, for the biotech startup, creating strong resources, including management teams, proprietary technology, and access to funds, is imperative for achieving a competitive advantage. However, the resource-based view has an internal focus that could underestimate the strategic use of external assets. Assets that are only accessible through strategic partnerships. (Wernerfelt, 1984; Göttel et al., 2024)

Still, it has to be mentioned that the resource-based view has been criticized for the limited attention it has on how firms acquire or develop new capabilities over time, especially in dynamic industries such as biotechnology, where static resource positions are often insufficient(Helfat & Peteraf, 2003).

2.4 Dynamic Capabilities View (DCV)

Dynamic Capabilities View (DCV) extends the Resource-Based View by emphasizing a firm's capacity to adjust and combine internal and external capabilities within a fast-changing environment. Strategic partnerships formation, for instance, is a dynamic capability for addressing internal resource shortcomings of biotech firms. Eisenhardt and Martin (2000) note that dynamic capabilities can manifest as processes that are identifiable and learnable, such as partner selection and partnership management. This provides a solid perspective of the orchestration of resources, especially relevant for industries such as biotechnology. (Helfat & Peteraf, 2003)

Unlike RBV's internal focus, the dynamic capabilities view highlights how firms can adapt and reconfigure resources in response to changing environments. This makes it especially relevant for managing partnerships in the biotech sector, as this industry is constantly changing (Teece et al., 1997).

2.5 External Strategic Partnerships

Strategic partnerships can give access to complementary resources to startups, these resources include technological know-how, regulatory expertise, production capabilities, and market networks. These can be difficult to obtain otherwise. There are various forms of partnerships, such as research collaborations, licensing agreements, joint ventures, or strategic equity investments. Despite their strategic value, to this day, partnerships are relatively neglected in research done on the growth trajectory of biotech startups. (Allen et al., 2021)

2.6 Timing, Type, and Intensity of Partnerships

The effectiveness of partnerships depends on the following:

Timing: When partnerships are throughout the development stage of a startup (e.g., preclinical vs. commercialization). Startups face different needs at different stages. Early stage partnerships can secure capabilities without the need for internal capabilitites, which increases survival chances. Late-stage partners support scaling and commercialization(Vohora, Wright, & Lockett, 2004).

Type: The nature of the partnership (e.g., R&D partners vs commercial partners). Different types of partnerships don't necessarily have the same role. Some can aid with knowledge while others can help with market access, regulations, and even financing. The alignment between the type of partners and the needs of the startup affects whether the partnership supports the growth or not (Diestre & Rajagopalan, 2012).

Intensity: The degree of commitment and integration between the partners. The depth of a partnership is connected to the level of commitment. High-intensity partnerships are needed for value co-creation and complex challenges. On the other side, low-intensity partnerships offer flexibility but limited potential (Inkpen & Tsang, 2005).

Current literature shows that early-stage partnerships may increase the survival chances of a startup, while late-stage partnerships can improve scaling. However, the impact that the timing, type, and intensity of partnerships have on the growth trajectory remains underexplored.(Vohora et al., 2003)

2.7 Visual Model

This study proposes that the timing, type, and intensity of strategic partnerships significantly influence the growth trajectories of biotech startups. A visual model is provided to facilitate a better understanding.

A visual model that displays the proposed effect of strategic partnerships on startup growth trajectories is presented in **Appendix 3**.

Particularly, partnerships established earlier in the development process, partnerships that complement important resource deficiencies, and partnerships with high intensity are predicted to have a positive relationship with consistent growth or successful scaling. Low-commitment partnerships or partnerships with poor timing are, in turn, predicted to be linked with growth reversal or premature failure.

3. Methodology

3.1 Research Design

This study employs a qualitative, inductive approach, utilizing semi-structured interviews to investigate the role of strategic partnerships in the growth of biotech startups. Given the exploratory nature of the research question and the complexity of partnership dynamics, a qualitative design is most appropriate.

The Gioia Method was chosen because it is effective for capturing subjective experiences and makes it easy to analyze patterns. The method is widely used for inductive qualitative research that is aimed at developing theory from participant narratives (Gioia, Corley, & Hamilton, 2013).

This approach was a good match for the study since partnership dynamics can be complex. The approach, combined with clear and targeted questions, helped with organizing the data and formulating themes.

3.2 Sampling Strategy

Purposive sampling was used to select biotech startups at various growth stages, including those that have experienced early failure, steady growth, growth reversal, or moderate scaling. Interviewees were people who have experience with biotech start-ups and were included in strategic decision-making processes regarding partnerships. The sample consists of 7 interviews. See Appendix 6.

3.3 Data Collection

Semi-structured interviews were conducted, guided by an interview protocol focusing on the timing, type, and intensity of partnerships. Interviews were recorded (with consent), notes were taken, and the data were anonymized unless explicit permission for disclosure was granted. (See Appendix 1)

Before the interview, participants received a brief that showed the research topic, interview structure, and key focus areas (timing, type, and intensity of strategic partnerships). The brief explains these concepts for better understanding and offers the participants some time to reflect on the questions before the interview.

Given that there were interviews that were conducted in Romanian, the notes had to be translated into English for analysis. In order to preserve the meaning of the original expressions, a careful translation approach was employed. Literal translations were avoided because they could distort the actual meaning of the responses. To ensure accuracy and integrity, each translation was reviewed, and ChatGPT was also used for the assessment of the translations. In some cases, where ambiguity arose, the text had to be slightly modified so that the translation could reflect the concepts clearly.

3.4 Data Analysis

The Gioia Method was employed to analyze the interview data. First-order concepts were derived closely from the participants' language. These concepts were then grouped into second-order themes through interpretation, and aggregate dimensions were finally formed to capture broader theoretical constructs. Coding was iterative, which allowed for refinement as new insights emerged.

To ensure consistent coding, an iterative coding process was used, with ongoing comparison while taking interviews. Member checking was not conducted, but codes were cross-verified with transcripts multiple times to maintain accuracy. The sample of seven interviews was appropriate as no new themes emerged, indicating theoretical saturation. A sample of this size is common and is often sufficient when theoretical saturation is achieved (Guest, Bunce, & Johnson, 2006).

3.5 Ethical Considerations

Participation is voluntary, and participants were informed about the purpose of the study, data handling procedures, and their right to withdraw at any time. Consent forms outlining these aspects were presented verbally to the participants before data collection. The names, roles, and other personal data of the participants are not being used or disclosed. See Appendix 2.

4. Findings

This chapter outlines findings based on interviews conducted among executives of biotech startups about how the timing, form, and intensity of partnerships impact their growth trajectory. The findings are organized through the use of the Gioia Method, in which first-order ideas are directly extracted from narrative data from the participants and then categorized into second-order themes before being distilled into aggregate dimensions. The approach offers an extensive framework for inquiring about impacts from external partnerships during different stages of startup formation and evolution, identifying main patterns and findings applicable to growth processes in the biotech industry. The complete Gioia table can be found in Appendix 5 and visual representations in Appendix 4. A visual representation of the Gioia coding can be seen in Appendix 9.

4.1 Overview of Interview Data

Data for the study was collected, as mentioned, through semi-structured interviews from executives who have valuable insight about biotech startups at various growth stages, ranging from early failure to steady growth and moderate scaling. The interviews are centered on the timing, type, and intensity of external partnerships, with a specific focus on how these factors influenced the growth trajectories of the startups.(See Appendix 1)

4.2 First-Order Concepts

First-order concepts represent the initial data points drawn directly from the interview transcripts. These concepts capture words, phrases, or expressions used by participants that point out their experiences and insights on how strategic partnerships affected the startups. These concepts form the foundation of the analysis and serve as the basis for identifying patterns and themes.

The following first-order concepts, grouped into second-order themes and then aggregated into dimensions, follow the Gioia methodology. The Gioia table is displayed in Appendix 5.

4.2.1 Timing of partnerships:

Timing refers to the point in time when partnerships are initiated within a startup's phases. whether early, during product development, or scaling. Interviews revealed that the success or failure of partnerships depends on their alignment with the startup's phase and needs.

As one interviewee stated: *"We moved quickly in the research phase but realized that by the time we needed to move to clinical trials and commercialization, we lacked the right partners."* Another participant said: *"Some delays occurred because production partners weren't involved early enough."* These missed opportunities show the importance of aligning partnerships with the startup's growth phase.

Illustrative first-order concepts:

Early-stage partnerships: "Academic validation in early stages"

Missed opportunities: "Lack of strategic partners during transition phases."

Delayed engagement: "Late inclusion of production partners caused delays."

4.2.2 Types of partnerships:

The type of partnership is its nature, there are partnerships with institutions and labs for R&D, regulatory, financial, and commercial partners. Interviewees emphasized that selecting the right type of partnership at the right phase was very important to prevent wasting resources and to advance.

Several participants highlighted the need for better early-stage partner management: *"We would have waited for a more validated product before seeking partners,"* and *"Involve production and regulatory partners earlier to avoid delays."* These illustrate how early missteps can have consequences.

Illustrative first-order concepts:

R&D partnerships: "Used early academic ties to validate ideas."

Clinical trial partnerships: "Engaging service providers to scale manufacturing."

Regulatory partnerships: "Lack of regulatory skills led to strategic partnerships."

Investor partnerships: "Attempted but failed to raise funds via grants/investors."

4.2.3 Intensity of partnerships

Intensity is the depth and commitment level of the partnerships. Some startups engaged in high-intensity partnerships that involve shared resources, co-located teams, and deep integration. Others preferred low-intensity arrangements, which offered flexibility but lacked sustained involvement.

One participant described: *"With pharma: weekly meetings, shared project management tools."* Another stated: *"Pharmaceutical and production partnerships were high-intensity, involving joint teams, strategic planning, and regular meetings."* These examples highlight the level of integration in high-intensity partnerships.

Illustrative first-order concepts:

Low-intensity partnerships: "Improper management of low-intensity collaborations causes failure."

High-intensity partnerships: "Use of structured tools and communication in pharma partnerships."

Strategic misalignment: "Culture and pace mismatch causing setbacks"

4.2.4 Impact on growth:
The impact on growth captures the *overall effect* of strategic partnerships on the startup's growth trajectory. Participants noted that partnerships that are properly aligned in type, timing, and intensity acted as directly contribute to scaling, market entry, or regulatory success. However, misaligned or untimely partnerships often led to delays or setbacks.

As one representative reflected: "Changing production partners led to delays." While another one added: "Coordination burdens within partnerships reduced growth speed." These quotes underline how insufficient alignment can directly hinder growth.

Illustrative first-order concepts:

Accelerated growth: "Partnerships enabled validation, market access, and technological improvement"

Growth delays: "Coordination burdens within partnerships reduced growth speed."

Failure risks: "Production and regulatory partnerships were critical for operations."

4.3 Second-Order Themes

The analysis of the first-order concepts resulted in the identification of a number of broad themes that offer a richer perspective on how partnership timing, type, and intensity affect biotech startup growth. The themes show how the partnerships progress through different growth stages.

4.3.1 Strategic timing and partnerships
This theme shows how the moment at which partnerships are formed can significantly influence outcomes. The effectiveness of a partnership is not only related to the type or intensity but also to its alignment with the current needs of a startup. The following second-order themes illustrate the role of timing in both giving and constraining growth opportunities. See Appendix 4C.

- *Missed opportunities because of timing*
- *R&D partnerships' role in early survival*
- *Strategic timing and partnerships*

4.3.2 types of partnerships
This theme illustrates how focusing on the right partner can affect the development and future of a startup. From institutional partners to commercial and technology, every type, choosing the right type is essential to maximize growth and prevent wasting resources. The following second-order themes show the partnership types and their alignment with the startup's strategic needs. See Appendix 4A

- Pharma partnerships for commercialization
- R&D Partnerships with institutions
- Regulatory and investor partnerships
- Tech/Data partnerships

4.3.3 Partnership intensity and engagement
This theme explores the level of engagement between startups and their partners. The intensity of partnerships can range from low to high. The following second-order themes give insight into how varying levels of intensity influence outcomes. See Appendix 4B

- High-intensity partnerships
- Low-intensity partnerships
- Strategic alignment vs cultural mismatch

4.3.4 Impact on growth trajectories
This theme can be seen as an overarching dimension that integrates the influences of partnership timing, type, and intensity on the startup growth trajectory. As illustrated by the visual model (see Appendix 5, Figure A4). Moreover, it is important to understand exactly how these dimensions impact the trajectory. The following second-order themes show the mechanisms throughwhich partnerships influence growth. See Appendix 4D.

- Evolution from academic to commercial partners
- Learning from partnerships
- Changing Needs
- Partnerships as growth accelerators
- Setbacks because of partnerships

4.4 Aggregate Dimensions

The following aggregate dimensions emerged from the consolidation of the second-order themes and reflect deeper patterns discovered. These dimensions represent the implications of partnership dynamics in biotech startups, match the research questions, and capture how timing, type, and intensity collectively influence growth outcomes.

4.4.1 Timing as a determinant of survival:
Partnership timing is an important factor in determining startup survival. Collaborative research and development in the earlier stage set the stage for product creation, whereas subsequent collaborations with regulatory agencies and distribution channels enabled growth and market entry.

Partnerships with academic institutions were found to be crucial for laying the groundwork for product development (R&D). Delays in acquiring major partnerships, especially in the aspects of scalability, manufacturing, and regulatory approval, were delaying expansion. This emphasizes the need for synchronizing partnership timing according to the stage of growth of the startup to avoid lost opportunities and stagnation.

The findings suggest that the timing of partnerships is not just a background variable but a strategic choice. The pattern observed is that securing key partnerships early, particularly in R&D, can help build momentum and avoid critical developmental bottlenecks.

4.4.2 Partnership Type:
The shift from early-stage, R&D-centric partnerships into high-intensity, business-driven partnerships was instrumental for long-term growth. Startups that successfully made this shift had smoother scalability, whereas those that did not suffered delays.

Partnership evolution follows a distinct path, with progress from research-stage R&D partnerships to partnerships that are

more business-centered. Startups that were able to shift from research-based partnerships to regulatory organizations, pharmaceutical organizations, and distribution channels tend to show steadier growth. Startups that couldn't adjust their partnership models lagged in evolving beyond the development stage.

A clear pattern emerged: startups that adapted their partnerships to align with their phase of development, transitioning from technical research to market-focused partnerships, were more successful in scaling. Conversely, those that remained locked in early-stage partnership modes struggled to achieve long-term growth.

4.4.3 Intensity of partnership engagement:

High-intensity partnerships involving resource-sharing and deep integration proved vital in overcoming growth bottlenecks. In contrast, low-intensity partnerships were insufficient for driving substantial scaling efforts.

Startups that had high-intensity partnerships were better positioned to coordinate development tasks and navigate regulatory demands. In contrast, low-intensity partnerships, although useful in early stages because of the higher flexibility and lower commitment, lacked the structural did not led to significant scaling.

4.4.4 Growth:

Strategic allocation of resources to manage partnerships was important in determining the success of growth-oriented collaborations. Startups that neglected strategic resource allocation often encountered delays and missed opportunities.

The type, timing, and intensity of partnerships significantly impacted the growth trajectories of biotech start-ups. Strategic, timely partnerships served as catalysts that sped up growth and market penetration. But ill-timed, poorly aligned partnerships resulted in lag, lost opportunities, and stagnation. The turning point from R&D stage partnerships to high-intensity, scale-focused partnerships became a milestone for long-term growth.

Overall, Startups that executed well-timed, well-targeted, and integrated partnerships tended to perform better. In contrast, those that failed to align these dimensions encountered difficulties that limited growth potential and long-term competitiveness.

4.4.5 Growth Reversal:

Growth reversals occur when partnerships are not aligned well with the needs of the startup or when partnerships fail to deliver expected outcomes. Some startups experienced delays or stagnation after having issues related to either partnership timing or expectations. For example, some production partnerships were changed mid-process, leading to coordination issues and delays. In other cases, partnerships required higher coordination efforts than initially anticipated, which reduced operational speed and flexibility. These setbacks can cause growth reversal in biotech startups.

4.5 Summary of Key Findings

The research points out the critical effects of partnership in influencing the trajectories of biotech startup growth. The timing, intensity, and form of partnership were found to have a significant impact on startup success, with timely, intensive partnerships serving as growth acceleration catalysts. Strategic resource planning and resource management were found to be important in ensuring optimal returns on partnership investments, especially in the R&D-to-commercialization stage. Highly integrated partnerships are better for success in later periods. This research shows the need for strategic, timely partnerships and resource management for ensuring growth and overcoming challenges in the biotech industry, which is competitive and very resource-constrained. To display the impact of partnerships on startup trajectories, Table 1 extends the Göttel et al. (2024) model by adding partnership-related insights.

Table 1. Extension of Göttel et al. (2024) Growth Trajectories with Partnership Dimensions

Göttel et al. (2024) Trajectory	Internal Resource Focus (Original Model)	External Partnership Insights (This Study)
Early Failure	Weak resource mobilization; internal misalignment	Absence or misalignment of early-stage R&D partnerships and regulatory support
Steady Growth	Effective capability building over time	Evolving partnerships that match startup lifecycle phases, from academic to commercial partnerships
Growth Reversal	Strategic missteps or overextension	Failure to intensify or adapt partnerships for scaling (e.g., missed pharma partnerships)
Moderate Scaling	Gradual internal scaling and capability deepening	Sustained, high-intensity partnerships with investors, pharma, and regulators, enabling controlled expansion

5. Discussion

In the chapter, the outcomes of the interviews are explained in the context of existing theories and models, illustrating how they contribute both to explanatory and practical value. The findings from the analysis of the timing, structure, and intensity of strategic partnerships and their influence on the growth trajectories of biotech startups were examined analytically through the Resource-Based View (RBV) and Dynamic Capabilities View (DCV). Furthermore, the practical implications of the findings and recommendations for biotech entrepreneurs and investors are discussed.

5.1 Interpretation of Findings

The results of this research underscore the key contribution that strategic partnerships make towards the growth trajectories of biotech startups. The type, intensity, and timing of these partnerships emerged as determinants of whether a startup follows a path of steady growth, experiences growth reversal, or faces early failure.

The findings provide clear answers to the research questions. In response to the timing of partnerships (Research Question 1), early-stage partnerships, particularly in the area of R&D, were important for survival and growth. For partnership types (Research Question 2), startups would advance from academic and research partnerships towards regulatory, pharmaceutical, and investment partnerships as the firm grew. Lastly, partnership intensity (Research Question 3) played an important role in scaling success, and high-intensity partnerships allowed for resource transfer and the overcoming of some obstacles. On the other hand, low-intensity partnerships tended not to support longer-term expansion.

5.1.1 Timing of partnerships

Early-stage strategic partnering played a vital role in establishing the foundation for product development and early validation. Startups that pursued early-stage partnering with an inadequately validated product had difficulty in establishing valuable partnerships later in their growth trajectory. This is consistent with the strategic timing literature, where early R&D collaborations are crucial for building competitive capabilities. (Teece et al., 1997; Vohora et al., 2003)

On the other hand, companies that found the right partners at the right moments took advantage of early R&D collaborations and then transitioned towards more strategic, high-intensity partnerships as they entered the clinical trial and scaling phases. These partnerships enabled growth and market entry, highlighting how timely strategic decisions are critical for long-term success.

5.1.2 Types of partnerships

The research revealed that R&D partnerships were the most vital in the early phases of a biotech startup's growth. Startups emphasized collaborations with pharmaceutical and research partners a great deal in the initial phases of their growth, which validates the RBV theory that companies need external resources (such as expertise in carrying out research) to develop competitive strengths (Wernerfelt, 1984). With the growth of the startups, the emphasis turned more towards pharmaceutical and regulatory partnerships. The startups that had weak pharmaceutical collaborations had slower scaling due to the bureaucracy of regulation. This validates the DCV that emphasizes the importance of companies' need to adjust themselves according to the changing external environments in complex industries such as biotech (Teece et al., 1997).

5.1.3 Intensity of partnerships

Partnership intensity had a direct influence on growth trajectories. (Prashant & Harbir, 2009) Partnerships of high intensity with deep sharing of resources and joint strategic objectives offered the support that enabled the startups to break bottlenecks and grow more quickly. These partnerships enabled access to common resources, staff, and communication channels, resulting in improved growth and efficiency of operations. Low-intensity partnerships that involved mere exchange of information or low-level collaborations served the startups well in the beginning, but not for long-term growth and commercialization. This is consistent with the literature that stresses the significance of more integrated collaborations as the startup scales (Clarysse et al., 2014; Teece et al., 1997).

5.1.4 Impact on growth trajectories

Strategic partnerships were proven to be accelerators or bottlenecks of startup growth. Firms that entered into the appropriate partnerships at the appropriate time experienced accelerated growth, with licensure arrangements or collaborations with bigger pharmaceutical firms enabling scaling and access to the marketplace quickly. This confirms that strategic partnerships are fundamental growth enablers that enable access to markets, resources, and approval (Ambos & Birkinshaw, 2010).

Meanwhile, startups with misaligned or untimely partnerships suffered setbacks. Time spent seeking valuable partnerships or collaborating with smaller partners abbreviated the period before bottlenecks, causing product development and approval delays, thereby slowing scaling efforts (Achtenhagen et al., 2017).

5.2 Contributions to Theory

This research contributes to the literature on startup growth trajectories by stressing the critical contribution of external strategic partnerships. The findings broaden the Resource-Based View (RBV) and Dynamic Capabilities View (DCV) by introducing the dynamics of the timing, type, and intensity of partnerships, providing a more comprehensive understanding of how such external drivers of growth affect the growth of startups.

5.2.1 Extension of Growth Trajectory Models

Traditional startup growth models, like those by Göttel et al. (2024), focus on internal capabilities and resources. This research builds on these models by incorporating external partnerships, illustrating that the timing and intensity of these partnerships, as well as their occurrence at certain points of growth, play a significant role in determining whether a startup realizes growth or failure.

5.2.2 Typology of Partnership-Driven Growth Pathways
The paper presents a new typology of partnership-driven growth pathways, categorizing startups according to how they effectively leverage strategic partnerships. This typology offers a valuable framework for future research, serving as a means to assess the significance of third-party collaborations in driving the success of startups.

This typology builds on current growth trajectory models by adding to them the connections between partnership type, timing, and intensity as dynamic drivers of growth paths, as displayed in table 2. In contrast to earlier models that focus primarily on internal capabilities, this framework also points out that partnerships can both facilitate scaling and induce reversals of growth based on their configuration. The alignment of partnership configuration is the new dimension introduced by this model. Startups that have a partnership with their type and intensity aligned to their stage of growth have more stable trajectories. On the other hand, misaligned partnerships can result in setbacks and growth reversals. This adds a concept for the integration of external resources into growth theories.

Table 2. Partnership-Driven Growth Typology of Biotech Startups

Growth Path	Timing	Type	Intensity	Outcome
Steady Growth	Balanced	Well-matched	Aligned	Sustainable scaling
Moderate Scaling	Slightly delayed	Selective	Aligned	Gradual growth
Early Failure	Delayed / missed	Mismatch	Heavily unaligned	Failure
Growth Reversal	premature	Mismatch	Unaligned	Negative impact

5.3 Managerial Implications

The research has several significant implications for investors and entrepreneurs in the biotech space. Entrepreneurs should concentrate on securing the appropriate forms of partnerships at the right times. Early-stage partnerships ought to revolve around R&D, and subsequent-stage collaborations around regulation as well as access to the market. It is vital that the appropriate timing of these partnerships is understood to prevent delays in growth and regulatory approval. Additionally, startups should allocate sufficient resources to high-intensity partnerships, particularly during the transition from R&D to commercialization. While low-intensity partnerships are valuable in the early stages, they are not sufficient for addressing scaling challenges.

Startups should engage in a diversified portfolio of partnerships with academic, regulatory, and commercial partners. Diversification reduces the risks involved and ensures that the startups get access to the requisite resources in various phases of growth. (Allen et al., 2021)

From the perspective of investors, the analysis indicates that the partnership strategy should be a foremost consideration when investing. It is more likely that the startups with a clear partnership strategy and the capacity to obtain high-quality partnerships will succeed and scale up quickly

Based on the findings from the research, the following practical recommendations are suggested to biotech entrepreneurs and investors:

- Engage in early-stage R&D partnerships to access vital resources and mitigate risks of early failure.
- Develop partnership management capabilities to enable the transition from research-focused to commercialization and scaling partnerships effectively.
- Allocate adequate resources to foster high-intensity partnerships during scaling phases, as these are crucial to overcoming growth bottlenecks and entering new markets.

In addition to these points, founders and investors can benefit from a more structured partnership assessment framework. Founders should evaluate partnership timing, type, and intensity alignment to the different stages of growth to ensure partners meet current needs. Investors may assess partnership readiness by reviewing current partners, the quality of the partnership, and agreements. A full checklist of practical partnership management guidelines is provided in Appendix 7.

While this study centers on partnership dynamics within biotech startups, the findings might carry broader implications for innovation ecosystems in emerging or undercapitalized regions. In environments where public funding is scarce and institutional infrastructure is still consolidating, strategic partnerships may not simply be growth enablers but a condition for survival. The Romanian Eastern European context revealed how partnerships substitute for internal capacities that are otherwise expected in Western ecosystems. This insight suggests that startup support strategies in developing economies should prioritize mechanisms that facilitate partner matchmaking, trust-building, and integration readiness at early stages of venture development. (Nylund, Ferras-Hernandez, & Brem, 2020)

5.4 Limitations

While this study provides valuable insight, there are a few limitations that should be kept in mind. The sample population is appropriate for qualitative analysis but is not likely to fully capture the general population of the rest of the biotech industry. A more diverse sample population would probably yield more generalizable results. The majority of the sample population in the current study consisted of startups that mostly continued in business, potentially introducing a bias toward positive outcomes. Additionally, while member checking was not performed, cross-checks of the coding with the original notes were conducted.

Furthermore, the sample for the interview could be subject to positive bias, as most involved startups are still active and/or

experiencing at least some form of growth success, perhaps underrepresenting those that failed. This restricts the ability to make complete generalizations about all biotech startups. It has to be mentioned that the emphasis on biotechnology can potentially hold back the transferability of these findings to other fields, which have different partnership configurations.

Another limitation of this research that has to be noted is the geographic concentration of interviews. Most involved startups were from Romania, a developing country in the European Union. Although Romania has an emerging biotech industry and a growing startup environment, this country does not share the same extent of available capital, research facilities, or public funding mechanisms that exist in Western European nations like France, the Netherlands, or Germany. Consequently, Romanian biotech startups may be even more dependent on external partnerships. Not only for knowledge or technology transfer, but for access to financial, regulatory, and operating resources that may be acquired internally in wealthier ecosystems. (Raasch et al., 2013)

This setting could bias the findings toward an exaggeration of partnerships as a survival and growth mechanism, relative to what would be found in Western companies that enjoy different or more varied resource channels. So while the insights are useful, caution should be applied, and the socioeconomic conditions of the Romanian startup scene should be taken into account. Future research could benefit from comparative research that features startups from various nations for cross-country verification.

Self-selection could be another possible source of bias. This study focuses on strategic partnerships, so startups that did not see a direct impact from such partnerships might have decided that they do not have anything insightful to offer and declined to take part. A lot of startups that were contacted declined the interview, and this might have been a reason for that. But because of this, the sample might not represent start-ups for which partnerships had no significant impact, and over-represent start-ups that were favorably impacted by them. This could potentially skew the results in favor of growth paths that relied on partnerships more.

5.5 Suggestions for Future Research

Future work could explore the link between various forms of partnerships and growth paths using quantitative approaches. Large-scale surveys of firms would help with the validation of the evidence from this analysis and might give a wider perspective on the contribution of partnerships to startup success. Longitudinal studies that track changes in the trajectory of partnerships over time might give us a better understanding of how these develop and affect growth throughout a startup's business lifecycle. Cross-industry comparisons might further evaluate the transferability of the partnership-driven growth path model across industries outside of the biotech sector, enhancing the generalizability of the evidence. Chapter 5 provides a clear picture of the findings from this study, the body of theory, and the presentation of actionable implications for biotech startups. By incorporating partnership dynamics into growth path models, this research offers a more complete picture of startup development, highlighting the strategic value of external partnerships.

6. Conclusion

This research explored how the type, intensity, and timing of strategic partnerships influence the growth paths of biotech startups. Based on interviews with growth-stage biotech company executives, the authors identified primary findings that show how these partnerships launch and impede success.

The timing of the partnerships is essential: early-stage R&D partners for product development and subsequent partnerships with regulators, pharmaceutical companies, and investors later on play a key role in scaling and commercialization. The nature of partnerships changes with the stage of the company as well as with time, shifting from partnerships involving academic institutions centered on R&D towards more strategic partnerships involving scaling and market access. The intensity of involvement within partnerships is equally critical in terms of growth. A high-intensity involvement with deep integration and sharing of resources is a key requirement for resolving bottlenecks when scaling.

The work adds to the body of literature by applying growth path models such as resource-based views and dynamic capabilities views to the consideration of external partnerships, providing a more complete picture of startup success. It also confirms the utility of the Resource-Based View (RBV) and the Dynamic Capability View (DCV) in explaining how startups can use external resources such as partnerships to adapt and grow in dynamic environments. This aligns with the idea that startups must continue to adapt both internal and external capabilities in dynamic markets (Teece et al, 1997)

It is valuable for entrepreneurs and capital investors because the findings imply that the right partners at the right time, wise resource allocation, and portfolio diversity, such as different types of partners, are necessary tactics of entrepreneurship.
This study was guided by the main research question: "In what ways do the timing, type, and intensity of strategic partnerships shape the growth trajectories of biotech startups?" The findings showed that partnerships are not just supporting mechanisms but key factors of growth, depending on how well their timing, type, and intensity align with the startup's phase and strategic needs. The main research question was followed by three sub-questions that further clarified specific mechanisms.

RQ1: *How does the timing of partnerships affect startup growth?* Timely early-stage partnerships can facilitate survival and product development, while late or misaligned partnerships delay scaling and can even lead to stagnation.

RQ2: *What types of partnerships contribute most significantly to growth?* It was discovered that a shift from R&D-focused partnerships to commercialization and regulatory partnerships is essential for long-term growth.

RQ3: *How does partnership intensity influence growth outcomes?* It is implied that high-intensity partnerships involving deep integration and shared objectives are key drivers for scaling.

This study concludes that the strategic management of partnership timing, type, and intensity plays a foundational role in determining the growth of a startup. These three dimensions emerged as important factors shaping the growth path, with their alignment to the strategic needs of startups and phases being essential.

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Appendices

Appendix 1 : Interview Guide

This appendix displays the interview questions that were used.

Interview Sections and Questions

Section 1: Introduction

- **1.1.** Can you briefly introduce yourself and your role within [Startup Name]? (personal details such as the name, role and other personal information will not be made public or used in any way)
- **1.2.** How long have you been involved with [Startup Name]?
- **1.3.** At what stage is your company currently (e.g., preclinical, clinical, market expansion)?

Section 2: Strategic Partnerships Overview

- **2.1.** Could you describe the types of external partnerships [Startup Name] has formed (e.g., universities, pharma companies, labs, investors, government, etc)?
- **2.2.** What motivated the company to seek external partnerships?

Section 3: Timing of Partnerships

- **3.1.** At which stages of your startup's journey did you engage in partnerships?
- **3.2.** Looking back, was the timing of partnerships crucial to growth or survival?

Section 4: Type and Evolution of Partnerships

- **4.1.** Which types of partnerships were most critical during the early stages of your startup?
- **4.2.** Have the types of partnerships evolved as your company developed?
- **4.3.** Were different partnership types more important at different stages of growth?

Section 5: Intensity and Management of Partnerships

- **5.1.** How would you describe the intensity of your partnerships (e.g., occasional collaboration vs. deep integration)(high-intensity vs low-intensity)?

- **5.2.** What resources (time, funding, staffing) did you dedicate to managing partnerships?

- **5.3.** Were there cases where partnerships consumed too many resources without delivering the expected benefits?

Section 6: Impact on Growth Trajectory

- **6.1.** How did external partnerships influence the growth trajectory of your company (e.g., speeding up development, scaling, market access)?

- **6.2.** Are there partnerships that had a negative impact or slowed your growth?

- **6.3.** Would you do anything differently regarding partnerships if you could go back?

Section 7: Reflection and Closing

- **7.1.** Based on your experience, what advice would you give to new biotech founders about partnerships?

- **7.2.** Is there anything else about partnerships and startup growth you believe is important but we didn't cover?

Appendix 2 : Consent Form

Consent Form for Participation in Interview

Based Research Research Title:
The Role of Strategic Partnerships in the Growth Trajectories of Biotech Startups

Researcher:
Eric Rusan, Bachelor Student, University of Twente

Supervisor:
Dr. Vincent Göttel University:

University of Twente, Faculty of Behavioural, Management and Social Sciences (BMS)

Purpose of the Research:
The purpose of this research is to understand how external strategic partnerships influence the growth trajectories of biotech startups. This research contributes to the completion of a Bachelor's Thesis in International Business Administration.

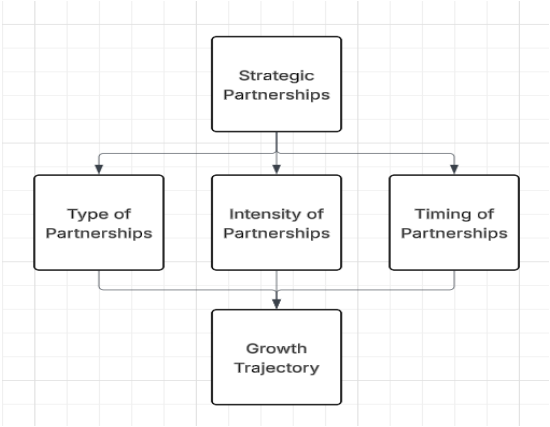
Procedure:
You will be asked to participate in a 30-45 minute semi-structured interview. Interviews will be audio-recorded (with permission) to aid transcription and analysis. You are free to decline any questions and can withdraw at any time.

Confidentiality:
All information will be kept confidential. Data will be anonymized unless explicit permission is given to use your name. Recordings and transcripts will be securely stored and deleted after project completion.

Voluntary Participation:
Participation is voluntary. There are no foreseeable risks associated with this study.

Appendix 3 : Visual Model

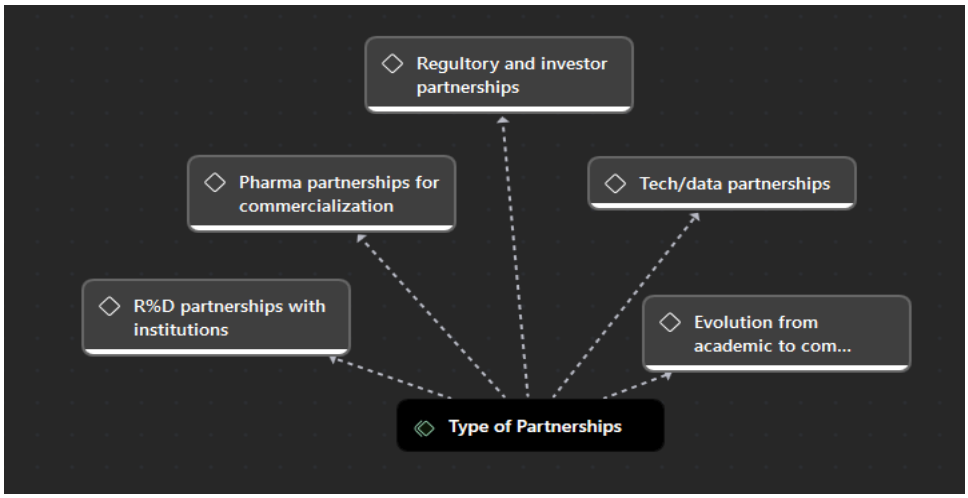
The Influence of Strategic Partnerships on Growth Trajectories in Biotech Startups



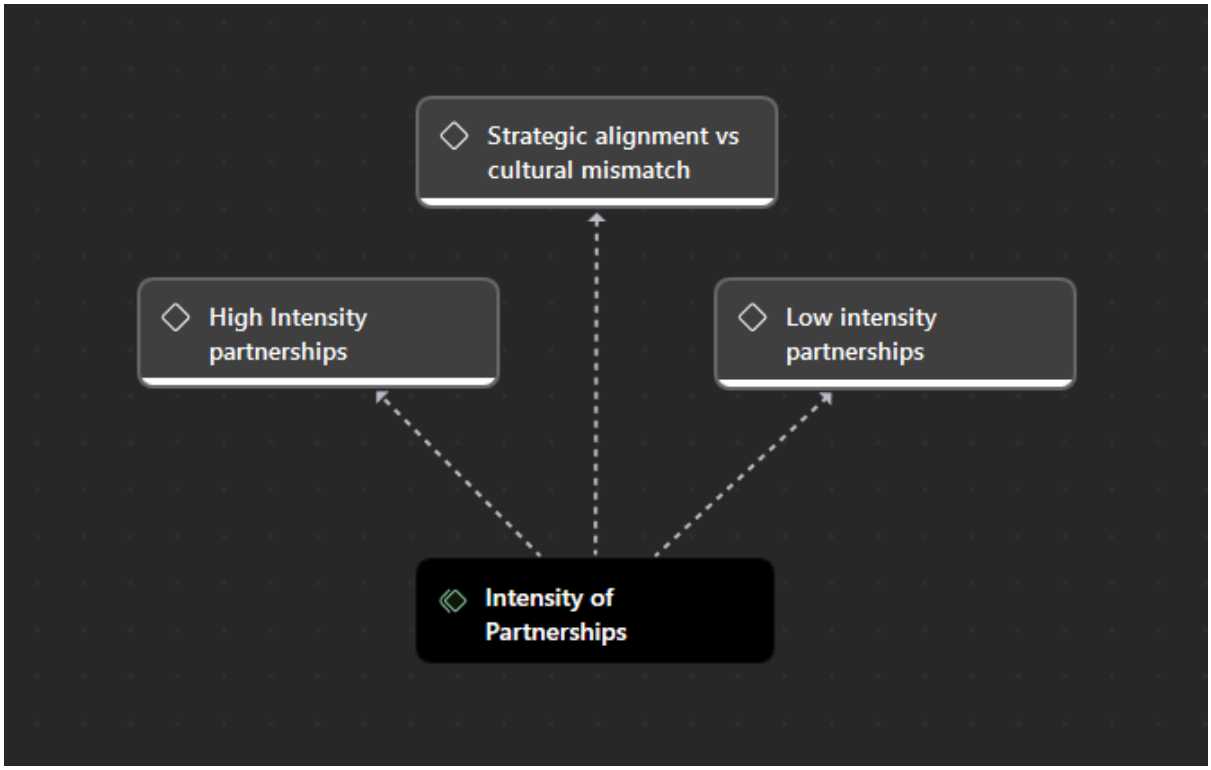
Appendix 5 : Gioia Coding Structure and Thematic Relationships

This appendix shows the visual representations of the data structure that was created with the Gioia methodology. The figures illustrate the coding process, from first-order concepts to second-order themes and aggregate dimensions. The models also display the relationships between partnership characteristics, such as timing, type, and intensity, and their impact on startup growth.

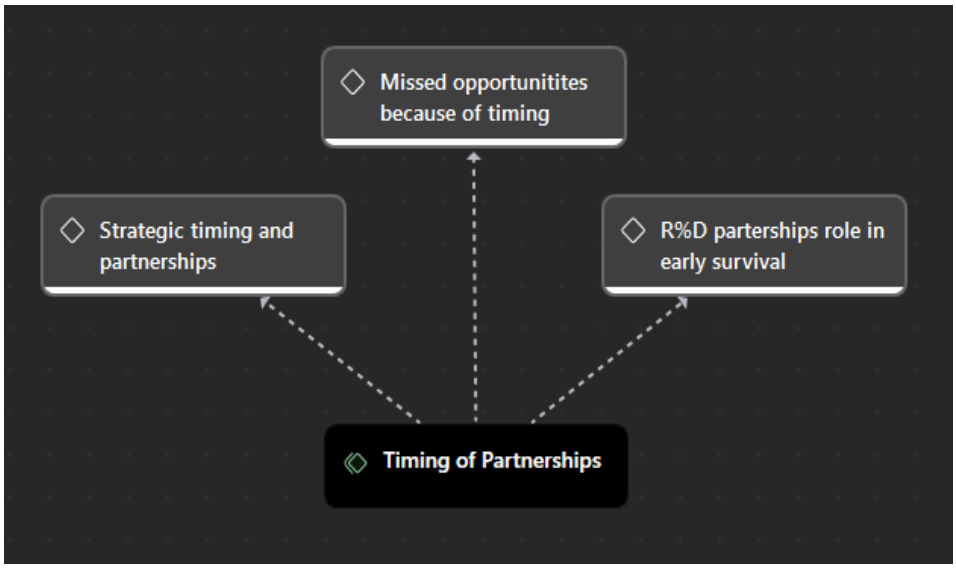
Appendix 4 A Type of Partnerships



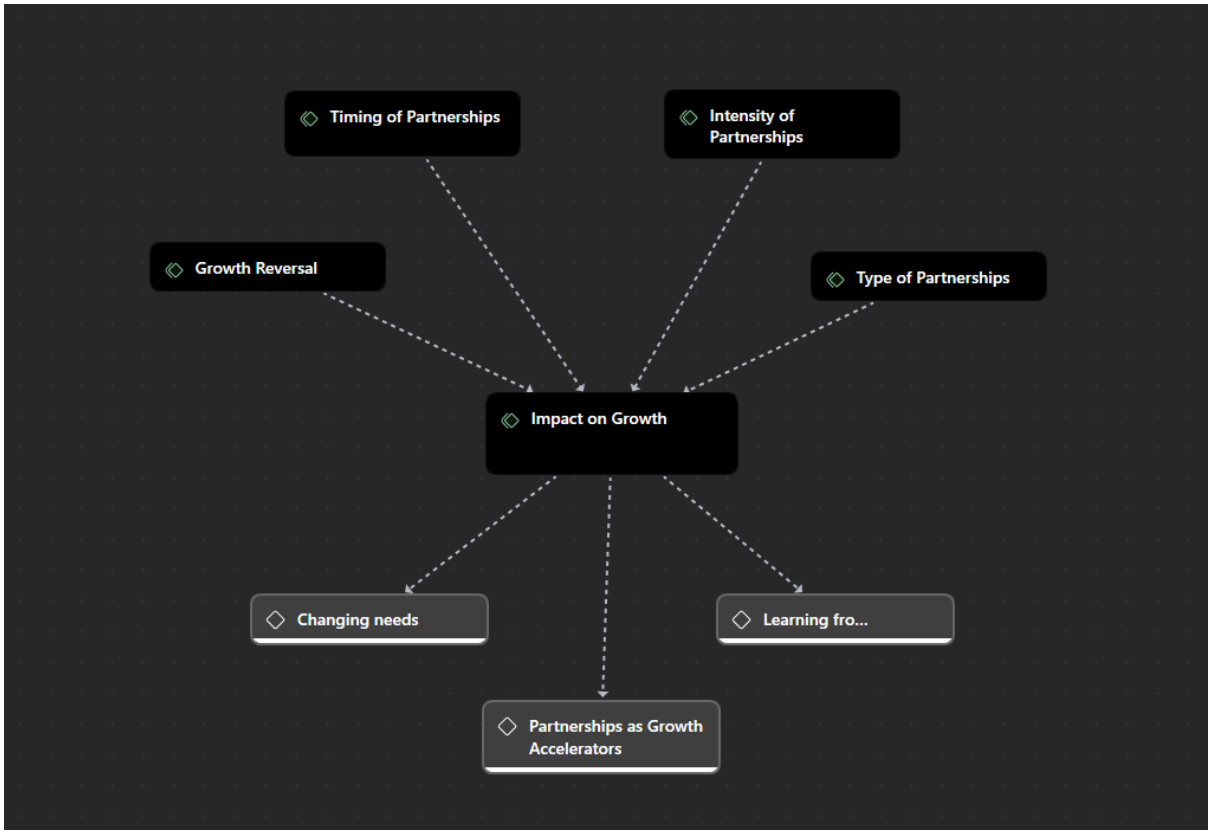
Appendix 4 B Intensity of Partnersips



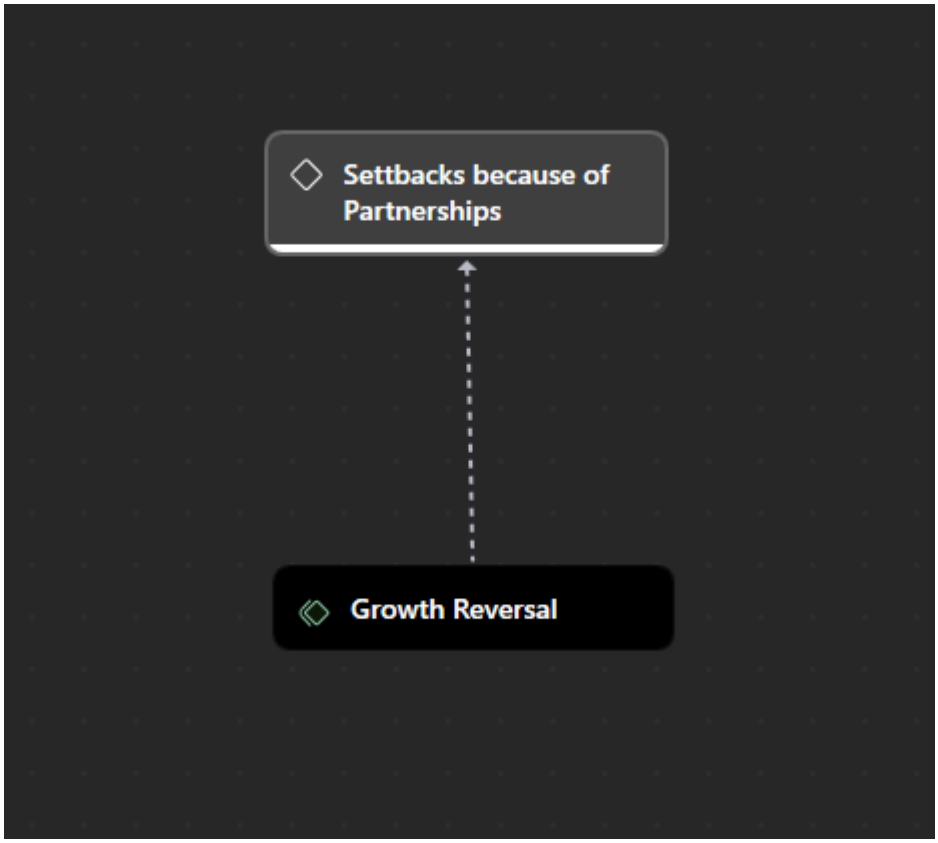
Appendix 4 C Timing of Partnerships



Appendix 4 D Impact on Growth



Appendix 4 E Growth Reversal



Appendix 5

The appendix shows the Gioia Coding Table, designed according to the analytical process followed for analyzing the qualitative data. The table charts illustrate the first-order concepts extracted from interview data, their grouping into second-order themes, and the subsequent formation of aggregate dimensions that represent partnership dynamics within biotech start-ups. The coding framework is based on the Gioia approach to maintain analytical transparency and theoretical alignment with the objectives set for this study. The quotes are notes that were taken during the interviews and then translated into English.

Notes	First Order Concepts	Second Order Themes	Aggregate Dimensions
As the company expanded internationally, the need for regulatory partnerships increased.	Regulatory partnerships became more crucial with international expansion	Changing needs	Growth
(the company) didn't realize quickly enough how different strategic partners needed to be at each stage.	Mismatch between partnership stages and company growth	Changing needs	Growth
Each stage has different needs for partners, and flexibility in adjusting the partnerships is key	Need for flexible partner adaptation at each growth stage	Changing needs	Growth
Production and regulatory partnerships became essential for operating efficiently and meeting standards.	Production and regulatory partnerships were critical for operations	Changing needs	Growth
The need for production, regulatory, and financial support increased as the company scaled.	Growth required increased production, regulation, and financial support	Changing needs	Growth
Initially, focused on expertise and support. Now, focus on strategic alignment with partners.	Shifted from technical support to strategic alignment	Evolution from academic to commercial partners	Growth
Pharma collaborations became more intense, while tech collaborations helped modernize their infrastructure.	Tech and pharma partnerships evolved with scaling needs	Evolution from academic to commercial partners	Growth
The company went from research partnerships to more commercially focused ones.	Transitioned from research to commercially focused collaborations	Evolution from academic to commercial partners	Growth
They moved from research partnerships to business-focused partnerships for scaling, regulatory work, and production.	Business-focused partnerships emerged in scaling and regulation	Evolution from academic to commercial partners	Growth
Would formalize partnerships earlier and set clearer KPIs and objectives.	Lack of early structure in partnership planning	Learning from Partnerships	Growth
Involve production and regulatory partners earlier to avoid delays	Early inclusion of operational partners prevents bottlenecks	Learning from Partnerships	Growth
We would have waited for a more validated product before seeking partners	Premature partnerships hindered development	Learning from Partnerships	Growth
We would evaluate compatibility better	Partner compatibility was underestimated	Learning from Partnerships	Growth
Better early-stage partner selection and management could prevent issues.	Improved early partner management could reduce risk	Learning from Partnerships	Growth
(the company) Would have started looking for commercial partners earlier.	Earlier commercial focus might have accelerated scaling	Learning from Partnerships	Growth
(The company) Would have set clearer expectations from the start	Clarity and structure needed when setting partnerships	Learning from Partnerships	Growth
Growth leaps linked to key successful collaborations.	Key partnerships triggered growth breakthroughs	Partnerships as Growth Accelerators	Growth

External partnerships were essential in shaping the path	Partnerships significantly shaped the growth direction	Partnerships as Growth Accelerators	Growth
Without these partnerships, the company would likely still be in the lab.	Growth depended on transformative collaborations	Partnerships as Growth Accelerators	Growth
Partnerships have helped with strategic positioning and skill building	Strategic partnerships build skills and visibility	Partnerships as Growth Accelerators	Growth
External partnerships were crucial for demonstrating the scientific validity of their product, gaining access to new markets, and improving technology. enabling them to scale and stay competitive.	Partnerships enabled validation, market access, and technological improvement	Partnerships as Growth Accelerators	Growth
The lack of strong partnerships kept them from progressing	Absence of strategic partnerships hindered growth	Partnerships as Growth Accelerators	Growth
Necessary for growing the company	Strategic partnerships were critical for scaling	Partnerships as Growth Accelerators	Growth
Usually, this happened when common grounds weren't defined	Lack of clearly defined goals caused partnership failures	Setbacks because of Partnerships	Growth Reversal
Some didn't go as expected	Partnership outcomes diverged from expectations	Setbacks because of Partnerships	Growth Reversal
While not catastrophic, some partnerships didn't align well and caused delays	Misalignment in partnerships led to delays	Setbacks because of Partnerships	Growth Reversal
Changing production partners led to delays	Switching partners disrupted production timelines	Setbacks because of Partnerships	Growth Reversal
The startup would have formalized and structured partnerships earlier, especially setting clearer KPIs and expectations from the start.	Lack of formalization and clear KPIs led to underperformance	Setbacks because of Partnerships	Growth Reversal
Some partnerships required more coordination than expected, slowing growth.	Coordination burdens within partnerships reduced growth speed	Setbacks because of Partnerships	Growth Reversal
Others are fully integrated with weekly meetings, common goals, and joint teams.	Fully integrated partnerships with structured collaboration	High Intensity partnerships	Intensity of Partnerships
Partnerships with large organizations involve weekly contact and are moderately intensive.	Moderately intensive partnerships with consistent interaction	Intermediate Intensity	Intensity of Partnerships
pharmaceutical and production partnerships were high-intensity, involving joint teams, strategic planning, and regular meetings.	High-intensity pharma and production partnerships with joint planning	High Intensity partnerships	Intensity of Partnerships
They failed to create deeper, more integrated relationships.	Failure to establish deeply integrated, resource-sharing partnerships	High Intensity partnerships	Intensity of Partnerships
With pharma: weekly meetings, shared project management tools.	Use of structured tools and communication in pharma partnerships	High Intensity partnerships	Intensity of Partnerships
Academic partnerships were moderate in intensity, while pharmaceutical and investor partnerships were high-intensity, involving joint teams, strategic planning, and regular meetings.	Intensity varies by partner type; high in commercial domains	Intermediate Intensity	Intensity of Partnerships
Academic partnerships were moderate in intensity	Academic partnerships featured moderate involvement	Intermediate Intesity	Intensity of Partnerships
Even “lighter” collaborations need to be managed properly, or they risk becoming ineffective	Improper management of low-intensity collaborations causes failure	Low intensity partnerships	Intensity of Partnerships
Most partnerships were of low intensity, with sporadic involvement.	Low-intensity partnerships lacked sustained engagement	Low intensity partnerships	Intensity of Partnerships

A production partner failed to meet commitments, leading to delays and additional costs.	Unmet expectations from production partners	Strategic alignment vs cultural mismatch	Intensity of Partnerships
a tech partnership that went on for months without delivering the expected results.	Prolonged tech collaborations with no results	Strategic alignment vs cultural mismatch	Intensity of Partnerships
An integration project with a tech partner stretched over several months but didn't yield the expected results.	Ineffective integration projects with tech partners	Strategic alignment vs cultural mismatch	Intensity of Partnerships
Some partnerships didn't match in terms of pace or culture, which caused setbacks.	Culture and pace mismatch causing setbacks	Strategic alignment vs cultural mismatch	Intensity of Partnerships
some partnerships took a lot of time and effort but didn't yield any results.	High effort, low return partnerships	Strategic alignment vs cultural mismatch	Intensity of Partnerships
partnerships, like with large organizations, were useful for exposure but didn't provide the practical benefits they expected.	Exposure-focused partnerships lacking practical value	Strategic alignment vs cultural mismatch	Intensity of Partnerships
At other times, they (the partnerships) were too late, which wasted time.	Delayed partnership formation led to inefficiencies	Missed opportunities because of timing	Timing of Partnership
If they could go back in time - focus on internal processes before signing with the pharma distributor.	Premature engagement with commercial partners	Missed opportunities because of timing	Timing of Partnership
Some delays occurred because production partners weren't involved early enough	Late inclusion of production partners caused delays	Missed opportunities because of timing	Timing of Partnership
We moved quickly in the research phase but realized that by the time we needed to move to clinical trials and commercialization, they lacked the right partners	Lack of strategic partners during transition phases	Missed opportunities because of timing	Timing of Partnership
Early academic collaborations came naturally when technology was still being formed.	Natural formation of early academic partnerships	R&D partnerships' role in early survival	Timing of Partnership
Academic partnerships formed early in the research stage	Early-stage academic collaboration	R&D partnerships' role in early survival	Timing of Partnership
Collaborated with research institutes from the beginning for validation.	Initial partnerships for scientific credibility	R&D partnerships' role in early survival	Timing of Partnership
Early partnerships with large organizations opened doors and provided networking opportunities	Early partnerships enabled validation and access	R&D partnerships' role in early survival	Timing of Partnership
Early-stage academic partnerships were relevant for providing validation and credibility.	Academic validation in early stages	R&D partnerships' role in early survival	Timing of Partnership
Collaborated with research institutes early on for R&D validation.	Partnerships with research institutes for early validation	R&D partnerships' role in early survival Strategic timing and partnerships	Timing of Partnership

Academic collaborations came naturally for scientific validation and lab support	Academic support during research validation	Strategic timing and partnerships	Timing of Partnership
As the company moved into clinical trials and production, pharmaceutical and production partnerships became essential.	Transition to production required strategic partnerships	Strategic timing and partnerships	Timing of Partnership
having partners at the right time could make the difference between success and failure.	Right-time partnerships crucial to the growth trajectory	Strategic timing and partnerships	Timing of Partnership
In hindsight, we would have invested earlier in building strategic partnerships, which might have led to a different trajectory.	Earlier investment in partnerships could have changed outcomes	Strategic timing and partnerships	Timing of Partnership
In some cases, we were lucky to find the right partner at the right time.	Serendipitous timing of effective partnerships	Strategic timing and partnerships	Timing of Partnership
Partnerships were formed during the company's construction phase, which was essential for technical support and growth.	Foundational partnerships during the setup stage	Strategic timing and partnerships	Timing of Partnership
The timing of partnerships depended on their needs at different times.	Partnerships aligned with evolving company needs	Strategic timing and partnerships	Timing of Partnership
The timing of partnerships has helped accelerate progress, providing training and promotion opportunities.	Well-timed partnerships accelerated progress	Strategic timing and partnerships	Timing of Partnership
Later: A licensing deal with a big pharmaceutical company, which helped with distribution.	Signed pharma licensing deal to aid distribution.	Pharma partnerships for commercialization	Type of Partnership
Over time, we started collaborating closely with pharmaceutical companies, not just as clients but as partners in developing certain tests.	Pharma companies became co-development partners.	Pharma partnerships for commercialization	Type of Partnership
We also negotiated with a pharmaceutical company for a licensing agreement, but those negotiations didn’t progress far.	Licensing deal failed to reach an agreement.	Pharma partnerships for commercialization	Type of Partnership
collaborating with pharmaceutical companies	Engaged in collaborations with pharma firms.	Pharma partnerships for commercialization	Type of Partnership
collaborations with large pharmaceutical companies for regulatory approvals and clinical expertise,	Pharma partners supported with clinical expertise.	Pharma partnerships for commercialization Regulatory and investor partnerships	Type of Partnership
pharmaceutical partnerships for regulatory approvals, production, and distribution	Pharma alliances addressed regulation and production.	Pharma partnerships for commercialization Regulatory and investor partnerships	Type of Partnership
(They built) Early academic partnerships (universities, labs).	Established early academic partnerships.	R&D partnerships with institutions	Type of Partnership
academic collaborations for research	Engaging in academic research collaborations.	R&D partnerships with institutions	Type of Partnership
Early partnerships were focused on validating the core ideas, often with academic teams or labs with the infrastructure needed.	Used early academic ties to validate ideas.	R&D partnerships with institutions	Type of Partnership
partnerships with universities, including Big South London, through innovation programs	University partnerships leveraged through innovation programs.	R&D partnerships with institutions	Type of Partnership

had strong academic partnerships in the R&D phase, collaborating with two universities for access to labs and scientific know-how.	R&D phase included university access and know-how.	R&D partnerships with institutions	Type of Partnership
the company sought academic collaborations to validate basic ideas, working with universities and laboratories	Sought academic collaborations for foundational validation.	R&D partnerships with institutions	Type of Partnership
(They have) Collaborations with large clinics	Collaborated with major clinical institutions.	Regulatory and investor partnerships	Type of Partnership
Investor partnerships for funding expansion	Forming investor alliances to fund expansion.	Regulatory and investor partnerships	Type of Partnership
Solid science was there, but they lacked regulatory knowledge, market access, and clinical experience => partnerships .	Lack of regulatory skills led to strategic partnerships.	Regulatory and investor partnerships	Type of Partnership
They tried to secure funding through government grants and private investors, but didn't achieve success.	Attempted but failed to raise funds via grants/investors.	Regulatory and investor partnerships	Type of Partnership
More recently, we have approached the tech sector, particularly for data infrastructure and AI.	Engaging the tech sector for AI and data infrastructure.	Tech/data partnerships	Type of Partnership
A data science company that helped understand diagnostic patterns before having an MVP.	Working with a data firm for early diagnostics insights.	Tech/data partnerships	Type of Partnership
service providers for clinical trial validation, and production partners to increase manufacturing capacity.	Engaging service providers to scale manufacturing.	Tech/data partnerships	Type of Partnership

Appendix 6 : Sample

MioSmile	Steady Growth	Romania
PharmaTech	Early Failure	Romania
Feronia Biotech	Moderate Scaling	Romania
Zala Medical	Moderate Scaling	Romania
EBR NET	Steady Growth	Romania
TransMedica	Steady Growth	Romania
IOncoHub	Pre-launch	United Kingdom

Appendix 7 : partnership management guidelines

Target Group	Key Action	Recommendation
Biotech Founders	**Evaluate Partnership Timing**	Engage R&D partners early to support product validation; secure commercial, regulatory, and investor partnerships before scaling.
Biotech Founders	**Choose Partnership Types**	Match the type of partner to the firm's current phase: academic and research partners in early stages; pharma, regulatory, investor, and production partners in later stages.
Biotech Founders	**Assess Partnership Intensity**	Use partnership intensity alignment: low-intensity partnerships for early flexibility and high-intensity partnerships (e.g., shared teams, weekly meetings, shared resources) for scaling.
Biotech Founders	**Manage Partnership Fit and Governance**	Define strong KPIs, goals, contracts, and organized management to avoid misalignments and resource inefficiency
Investors	**Assess Partnership Readiness**	Analyze the startup's existing partnership portfolio: number and quality of partnerships, alignment with stage of growth, contracts, and fit.
Investors	**Evaluate Scaling Potential**	Analyze whether founders have shown their potential to transition partnership orientation from R&D to commercialization and can handle increasingly complex partner networks.

Appendix 9 : Visual representation of Gioia Coding