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Fading corporate survival prospects: Impact of co-selection bias in resource allocation on strategic intent

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Abstract

Research Summary: Our field study of new business development in a German-based global pharmaceutical company reveals that the emergence of co-selection bias in project-level state-gate resource allocation engendered a corporate-level innovation portfolio imbalance. We show *how* the corporate portfolio imbalance resulted from incoherent managerial activities in the multilevel resource allocation process (RAP) decision context and how this caused fizzling out of the proactively established incipient strategic context of the favored-for-growth business unit. Moreover, we identify strategic RAP exploitation challenges that explain *why* sequential exploitation capability and exploitation drive *deficits* caused an *exploitation trap* that limited strategic discretion and stymied top management strategic intent to maintain the company's independence. Our integrated frameworks augment strategic management theory of corporate RAP and offer guidance for future research.

Managerial Summary: We draw attention to the little-noticed phenomenon of *co-selection bias* emerging in the project-level state-gate resource allocation to new business development and maladaptive corporate-level innovation portfolio outcomes that it may produce. We

show how top management can use the Bower–Burgelman RAP model to analyze the multilevel RAP decision context and identify the forces that may engender out-of-context managerial agency, such as co-selection bias. We highlight strategic RAP exploitation challenges that top management must meet by matching the RAP exploitation drive with a commensurate RAP exploitation capability to avoid an exploitation trap, thereby increasing the chances of company survival.

KEYWORDS

co-selection bias, exploitation trap, portfolio imbalance, strategic context attenuation, survival prospects

1 | INTRODUCTION

Resource allocation remains one of the most complex strategic management processes (Bettis, 2017; Maritan & Lee, 2017), and many studies still focus on financial capital allocation models that do not address the strategic resource allocation challenges faced by top management in large, complex organizations (Bower, 2017). Research that adopts a characterization of resources extending beyond financial resources and examines the strategic management challenges of nonfinancial resource allocation is called for.

Various studies confirm that resource allocation in large, complex organizations (Sengul et al., 2019) involves a multilevel, multi-objective evolutionary selection process (Aldrich & Ruef, 2006; Warglien, 2002). This process is governed by managerial selection criteria associated with the organization's internal selection environment (Burgelman, 1991, 1994), also known as "artificial selection environment" (Levinthal, 2021, p. xi), in contrast to the external selection environment.

Research indicates that the outcomes of the strategic *resource allocation process* (RAP) depend on the co-evolutionary interplay between internal and external selection events (Breslin, 2016; Volberda & Lewin, 2003). Longitudinal research on resource allocation at Intel Corporation, for instance, showed that internal–external selection interplays may have adaptive strategic RAP outcomes, such as the timely facilitation of corporate transformation, as well as potentially maladaptive ones, such as supporting a new technology that threatens to undermine the company's current core technology (Burgelman, 2002a; Levinthal, 2021). Additionally, managerial interest protection and internal politics (Henderson & Stern, 2004) may produce maladaptive strategic RAP outcomes such as the survival of weak subunits in large, complex organizations (Barnett, 1997). More research on elucidating the internal and external forces that may cause potentially maladaptive rather than adaptive strategic RAP outcomes in complex multilevel organizations is required.

To fill these gaps in knowledge, we report field research on the strategic RAP associated with new business development in a Germany-based global pharmaceutical corporation, referred to here as Pharma. Pharma's strategic RAP involved the commitment of nonfinancial

resources, such as researchers, knowledge bases, laboratory facilities, manufacturing facilities, strategic partner management, as well as funding for development projects of its different businesses. Pharma's strategic RAP was governed by a complex multilevel decision context involving sequential and simultaneous top-, middle-, and operational-level managerial activities to establish a resource allocation path with a series of strategic decisions about whether to initiate, prioritize, and continue or terminate individual development projects and create a corporate-level innovation portfolio to achieve top management's strategic intent.

Having successfully pursued a public offering in the United States in the early 2000s, Pharma's top management realized that the company had to grow faster to stay independent in the consolidating pharmaceutical industry. Having established a large market share with its gynecology and diagnostics business units and perceiving the opportunity to develop relatively new biotechnology and genetic medicine capabilities, the top management designated its therapeutic business unit during the mid-1990s as the most strategically important unit for corporate growth. Consequently, it was also favored to receive the largest share (approximately 50%) of the corporate project development budget to support allocation of radically new medical-related capabilities. Executives involved in Pharma's multilevel RAP decision context executed top management's growth strategy. However, by the end of 2005, the favored-for-growth therapeutics business unit was unable to meet top management's ambitious growth expectations. Although the company's revenue had grown from approximately 3.2 billion euros in 1997 to 5.3 billion euros in 2005, a much larger competitor referred to here as XYZ offered shareholders a 40% premium over Pharma's healthy share price and acquired the company in 2006.

These circumstances indicated that Pharma's case presented an existential and, to some extent, an ironic story of fading corporate survival prospects caused by an unanticipated strategically maladaptive RAP in support of radically innovative growth opportunities to maintain company independence. Therefore, we chose Pharma as an exemplary case (Siggelkow, 2007) to generate novel insights into how and why the corporate RAP, governed by clear and strong top management strategic intent and support for the favored-for-growth business unit, impeded the achievement of anticipated outcomes.

In light of this, our study intended to examine *what* caused Pharma's final strategic RAP cycle as an independent company, *how* this cycle came about in Pharma's multilevel RAP decision context, and *why* top management inability to timely meet the strategic RAP challenges associated with the relative failing of the favored-for growth business unit caused the company to lose independence.

This study goal first informed exploratory research to determine *what* happened with the help of state-gate system analysis of the historical archival data about Pharma's development project-level resource allocation decisions and the impact of these decisions on the evolution of the corporate-level portfolio of development projects during 1997–2005. It revealed that top management decided to *prioritize* individual development projects of corporate-level strategic importance for growth in the strategic RAP and established *high sales expectations and potential global coverage* as the selection rule guiding the prioritization of development projects of the different business units. Given the fixed budget quota of different business units, prioritized projects received the nonfinancial medical-related capabilities deemed necessary to speed up their progression through the official sequence of project development stages for pharmaceutical products. The selection of a pharmaceutical development project for prioritization always involved the co-selection of the particular development stage of that project, but Pharma's selection rule for project prioritization decisions *did not* include *early* development stage. However, our analysis revealed that projects of the favored-for-growth therapeutics business unit

disproportionally received prioritization in the earlier development stages than projects of gynecology and diagnostics. The unanticipated highly disproportionate termination of early-stage prioritized projects of the favored-for-growth therapeutics business unit, however, negatively affected the composition of the corporate-level subportfolio of prioritized projects, impeding top management's anticipated outcomes. Further analysis (Section 3.4.1) revealed that early-stage therapeutic projects suffered a significantly higher early-stage termination rate because they were overrepresented in the early development stages relative to those of gynecology and diagnostics. We defined the phenomenon of the emergence of a systematically disproportionate deviation from the established selection rule for project prioritization in resource allocation (in relation to early-stage projects of the favored-for-growth therapeutics business unit) in Pharma's state-gate system as *co-selection bias*.

Co-selection bias has received little systematic RAP research attention. As Levinthal notes, "Underlying this difficulty of organizations sustaining a diversity of selection criteria is the tendency for resources to be allocated by a hierarchical authority structure in the organization" (2021, p. 40). Therefore, it seemed plausible that co-selection bias emerged inadvertently in Pharma's multilevel RAP decision context because of the dispersed relevant knowledge and commitments that are often enacted simultaneously (Reitzig & Sorenson, 2013). Consequently, co-selection bias outcomes may be difficult to distinguish from unbiased targeted outcomes (Kahneman et al., 2021).

Follow-up interviews with top and senior executives involved in Pharma's RAP decision context provided retrospective insight into *how* the multilevel managerial activities produced RAP outcomes that impeded the anticipated strategic outcomes. Adopting the Bower–Burgelman (B–B) RAP model (Mintzberg et al., 1998) provided deeper insights into the managerial agency challenges Pharma faced in securing strategically effective RAP decision-making. It illuminated how the pattern of multilevel managerial activities concerning the initiation, prioritization, and termination of development projects caused the *incipient* corporate-level strategic context of the favored-for-growth therapeutics business unit, proactively established by top management, to *attenuate and fizzle out*. This became evident in 2005, when the revenue of therapeutics fell below that of the largest core business unit.

Examining *why* this attenuation and fizzling out of the strategic context of the favored-for-growth business happened raised novel questions about the balancing of exploration and exploitation (March, 1991), which "...has become central in thinking about the challenge of organizational learning and adaptation" (Levinthal, 2021, p. 71). Our interview data revealed that the transition from exploration (research) to exploitation (development) in RAP decisions for therapeutics projects was often more ambiguous than for development projects of gynecology and diagnostics. This ambiguity, caused by Pharma's relative inexperience of managing the allocation of radically new medical-related capabilities associated with the therapeutics business unit and the strong drive of the head of corporate R&D, suggested novel ways to examine more systematically the *strategic exploitation challenges* top management may face in the RAP for new business development. They involved an emerging strong *exploitation drive* (escalation of commitment through prioritization of early-stage therapeutics development projects in the RAP), and a weak *exploitation capability* (due to relative inexperience of managing radically new medical-related capabilities and concomitant inability to manage the progression of the early-stage prioritized therapeutics projects to later development stages).

In addition, our interview data indicated that German institutional and corporate culture forces prevented top management from changing the corporate-level budget quotas set for different business units to compensate for unanticipated outcomes and associated RAP strategic

exploitation challenges. This led us to infer that the emergence of an exploitation *capability deficit* (inability to move disproportionally prioritized early-stage therapeutics projects to later stages) combined with a subsequently emerging exploitation *drive deficit* (inability to compensate for the high number of failing early-stage prioritized therapeutics projects) produced an unanticipated RAP *exploitation trap* for top management. The RAP exploitation trap limited top management strategic discretion and caused fading corporate survival prospects because several much larger pharmaceutical rivals (who faced their own exploitation drive deficits at the time) became aware of it. The strong bid of XYZ for Pharma's shares compelled the board of directors to vote to end the company's independence in 2006.

2 | PRIOR LITERATURE REVIEW

2.1 | State-gate selection system and portfolio design research

Our field study draws on prior research on project-level state-gate selection systems, which has identified factors likely to drive the escalation of project commitment (Keil et al., 2000; McNamara et al., 2002; Schmidt & Calantone, 2002; Sleesman et al., 2018) and/or impede project termination (Brockner et al., 1986; Cooper, 2008; Green et al., 2003).

Particularly relevant to the project-level resource allocation aspects of our study, Klingebiel and Esser (2020) assert that high uncertainty makes business cases difficult to disconfirm in the early stages, which may lead managers to disregard early forecasts and projects hard to abandon once accepted. Moreover, they observe that project execution becomes a paramount concern in later development stages, and managers pay less attention to signs of failure. The downward revision of business cases makes termination more difficult than keeping the business cases stable or revising them upward. The potential negative effects of high-level management attention on containing escalation in stage-gate systems, and that project problems having greater cognitive salience may amplify known biases of decision makers (2020, p. 325), informed our identification of project-level co-selection bias.

Particularly relevant to our examination of the link between project-level stage-gate resource allocation and corporate-level innovation portfolio design, Klingebiel and Rammer (2014) distinguish breadth (allocating resources to several products in the portfolio) from intensity (the amount of resources allocated to a few individual products in the portfolio). They find that, on average, the benefit of breadth exceeds that of intensity. The benefit of breadth is greater for companies that allocate resources selectively at later stages of the innovation process, and the breadth-selectiveness effect is greatest for companies intending to create relatively more novel products. Additionally, they suggest that single-industry studies can provide more detail about the causal chain between resource allocation breadth, intensity, and portfolio performance.

Similarly, Si et al. (2022) note that research on companies in the pharmaceutical industry (Ding & Eliashberg, 2002) highlights a tendency for top management to overload portfolios, causing projects to compete for relatively scarce resources. Other research in the pharmaceutical industry has identified external selection pressures and events (DiMasi, 2001; DiMasi et al., 2003; Grabowski & Kyle, 2007; Grabowski & Vernon, 2000) that influence managers' decision-making, thereby affecting state-gate resource allocation outcomes.

However, Si et al. (2022, p. 4575) also argue that an overemphasis on project selection leads to the development of sophisticated analytical approaches but with the relative neglect of

portfolio design and a lack of alignment with corporate strategy. In particular, they note that "... portfolio management is not only an optimization and decision-making challenge, but in its core a multilevel organizational problem" (2022, p. 4578). They suggest that, since Bower (1970), researchers have studied different relationship dimensions between actors in an organization to understand portfolio outcomes and call for more research on the normative implications of multilevel portfolio management approaches (2022, p. 4578).

2.2 | RAP research

Our study draws on (B–B) RAP research (Bower & Gilbert, 2005; Burgelman et al., 2023) to examine how project-level co-selection bias and corporate-level innovation portfolio imbalance emerged in Pharma's multilevel RAP decision context and stymied top management strategic intent.

Bower's (1970) original RAP model included a 3×3 matrix, with rows representing top, middle, and operational management and columns representing three subprocesses. The *structural context* subprocess involved corporate-level management in determining the managerial systems that guide middle-level management in selecting and supporting capital investment projects in the *impetus* subprocess. Operational-level management formulated these projects in the *definition* subprocess, in response to perceived discrepancies between the available and projected needs for nonfinancial resources (in Bower's case, manufacturing resources) to pursue business opportunities.

As it conceptualizes the simultaneous and sequential involvement of differentially positioned managers, the RAP model can document the extent of alignment of these managerial activities in the internal ("artificial") selection environment constituted by the structural context (Burgelman, 1983, p. 240; Levinthal, 2021, p. xi). Bower (1970) argued that the structural context sometimes exerted negative effects on the RAP because it diverted or confused managers involved at lower levels, causing decisions and actions that were "out of context" (1970, p. 251). This helped interpret our findings about how the project-level co-selection bias associated with the prioritization of early-stage development projects of the favored-for-growth business emerges in the multilevel RAP decision context.

Burgelman (1983) extended the original RAP model to a 3×4 matrix by adding a *strategic context* subprocess. Middle-level managers activated the strategic context subprocess to persuade top management to *amend* the existing corporate strategy *retroactively* to integrate externally successful internal corporate ventures. Corroborating the usefulness of the strategic context subprocess, Burgelman (1996) found that the interlocking multilevel managerial activities might *dissolve* the firmly established strategic context of a failing core business through exit. Burgelman (2002b) found that a core business's extraordinary success might *impede* the activation of the strategic context for new business initiatives.

Burgelman (1983) also showed that retroactive rationalization of the strategic context of a new business depended on middle managers delineating the company's viable product-market position in a broad new field as a result of the success of the specific set of innovative projects that the new business pursued in that field. In our study, in contrast, Pharma's inability to establish a viable strategic position in major therapeutic product-market segments indicated that this caused the *incipient* strategic context of the favored-for-growth business unit, proactively established by top management, to *attenuate and fizzle out* rather than take hold.

Our B–B RAP analysis complements the normative view of corporate strategy driving resource allocation with a positive-descriptive view of resource allocation, which also drives corporate strategy. Specifically, resource allocation is a dependent variable determined jointly by the internal corporate decision context and external selection forces, as well as an independent variable that influences *realized* or *unrealized* strategies (Mintzberg & Waters, 1985). Moreover, the relationship with realized or unrealized strategy is interactive because of the feedback effects of realized or unrealized strategies on the strategic and structural contexts (Bower & Gilbert, 2005).

2.3 | Exploration–exploitation research

The transition from exploration (research) to exploitation (development) raises issues concerning the perception of differentially positioned executives in a multilevel RAP decision context (Csaszar & Levinthal, 2016; Levinthal, 2021). As Levinthal asserts, "From the perspective of an individual actor, most activities have an exploitative quality... In contrast, from the perspective of the observer, these same activities may be perceived as exploration or exploitation" (2021, p. 73). Our RAP study reflects this in the conflicting views of Pharma's top-level R&D and marketing and finance executives about the correct timing and extent of the transition from research to exploitation.

Archival data analysis indicated Pharma's lack of efficacy caused by relative inexperience in effectively allocating various radically new medical-related capabilities, which impeded timely progression of prioritized therapeutic projects, as well as their timely termination. This inspired a novel conceptual framework for examining strategic RAP exploitation challenges (capability and drive deficits). Building on insights about project- and corporate-level vicious cycles manifested in our B–B RAP model analysis, we developed and substantiated our strategic RAP exploitation challenges framework (Sections 3.4.3 and 4.3). This provided a plausible explanation for *why* Pharma top management faced limited strategic discretion and fading corporate survival prospects by 2005 and was unable to withstand further consolidation in the global pharmaceutical industry in 2006.

In summary, our study offers three contributions to strategic management theory of the corporate RAP captured in Figures 1–3 discussed in depth in Sections 4.1, 4.2, and 4.3. Figure 1 shows that project-level *co-selection bias* in the prioritization of financial and nonfinancial resource allocation to early-stage projects of a favored-for-growth business unit, combined with inefficacious project-level termination discipline and exacerbated by unfavorable external selection pressures differentially exerted on the multilevel decision context, may cause corporate-level portfolio imbalances that impede the achievement of top management's anticipated RAP outcomes. Figure 2 shows how the strategic incoherence of managerial action in a multilevel B–B RAP decision context may engender such unanticipated corporate-level portfolio imbalances, thereby causing *attenuation and fizzling out* of the proactively established incipient strategic context of the favored-for-growth business unit. Figure 3 highlights the strategic RAP exploitation challenges that may produce an *exploitation trap* explaining why top management may face limited strategic discretion and fading corporate survival prospects, especially in dynamic ecosystems (such as pharmaceuticals). These frameworks address the *what*, *how*, and *why* associated with the main goal of our field study and, together, constitute a novel theoretical lens that helps zooming out (macro picture) and zooming in (micro picture) on the strategic RAP in multibusiness corporations and associated challenges of corporate survival.

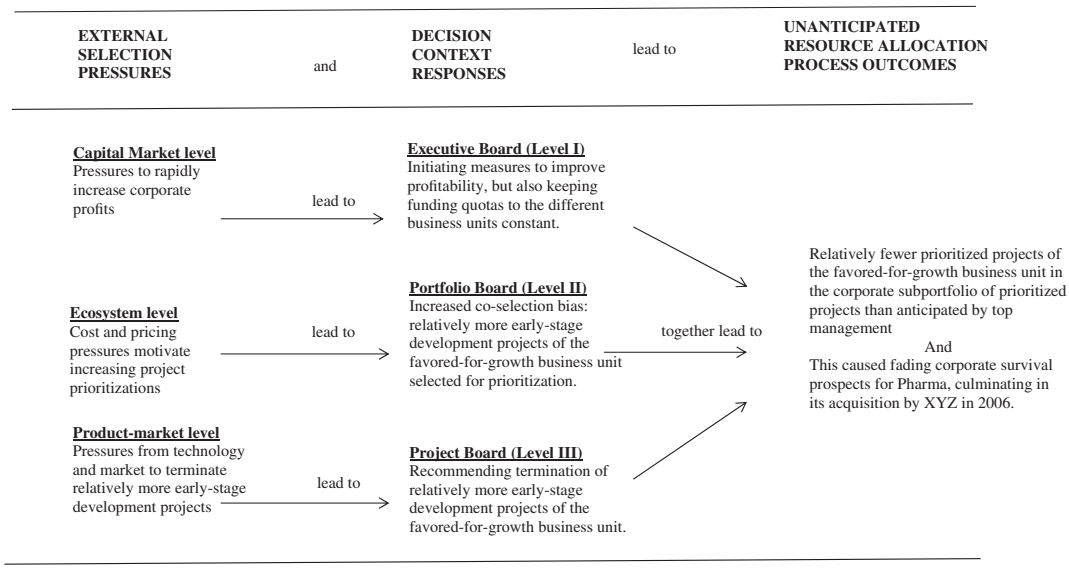

FIGURE 1 External pressures and internal decision context responses lead to unanticipated RAP outcomes.

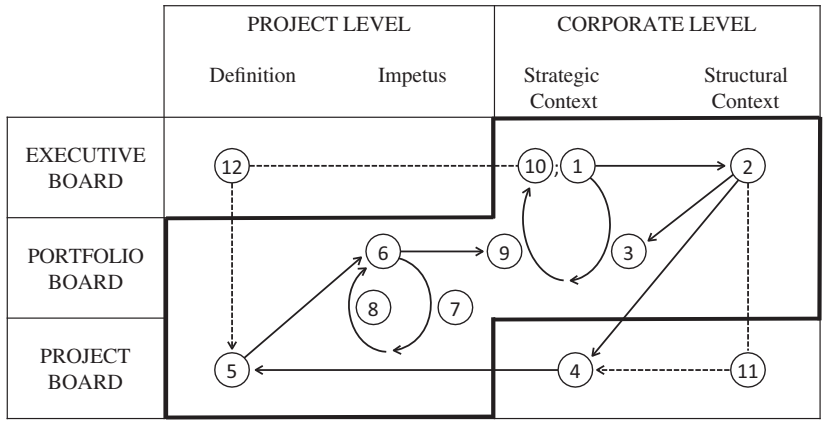

FIGURE 2 Unanticipated RAP outcomes cause attenuation and fizzling out of the strategic context of the favored-for-growth business.

Exploitation Drive	Exploitation Capability: Weak	Exploitation Capability: Strong
Strong	Capability Deficit	Exploitation Balance
Weak	Exploitation Trap	Drive Deficit

FIGURE 3 Strategic exploitation challenges emerging in the RAP.

3 | METHODOLOGY

3.1 | Research design

Our study employed a longitudinal grounded research method (Burgelman, 2011; Glaser & Strauss, 1967) that combined historical archival and interpretive interview data (Vaara & Lamberg, 2016). We conducted an intra-organizational comparative analysis of the RAP patterns associated with the development projects of Pharma's different business units in a single research setting. Moreover, we analyzed the relations between micro-level (project level) RAP decisions and macro-level (corporate level) outcomes in Pharma's final strategic RAP cycle as an independent company—a research method identified as "progression" (Kouamé & Langley, 2018).

We used a two-step sequential design. The first step involved analyzing the archival records of project-level state-gate system outcomes regarding the initiation, prioritization, and termination of the entire range of Pharma's development projects and their impact on the evolution of Pharma's corporate-level innovation project portfolio during 1997–2005. We also consulted public archival data on the capital market, pharmaceutical ecosystem, and product-market pressures that affected state-gate decision-making outcomes during 1997–2005 (Aaltonen, 2010).

The second step involved complementing our state-gate system analysis with a multilevel RAP decision-context analysis. We collected interview data from 15 top-, middle-, and operational-level managers who were deeply involved in Pharma's strategic RAP decisions during 1997–2005. Aware of the unavoidable potential for memory errors and retrospective rationalization, we recorded and examined the recollections of these key executives to gain additional information on the structural and managerial agency determinants of these decisions and their corporate-level portfolio and strategy outcomes. Comparing interview data from horizontal and vertical differentially positioned executives and contrasting verbal statements with published internal and external information suggested that the potential benefits of gaining additional insight into the relationship between the project-level state-gate system outcomes and corporate-level portfolio and strategy outcomes dominated the potential risks of misinformation. Additionally, we triangulated our interview data with statements from Pharma's annual reports and reviewed analyst reports and public commentaries on the acquisition by the acquiring company.

3.2 | Research setting

Pharma was a mid-sized, Germany-based global pharmaceutical company. It pursued three major businesses (the fourth one, dermatology, was small and was to be sold off during the research period; therefore, it was excluded from our analysis). Gynecology was renowned worldwide for its wide range of hormonal contraceptive products. Diagnostics provided contrast media for X-ray and magnetic resonance imaging processes to achieve far better accuracy in detecting various diseases. Gynecology and diagnostics were dominant in Europe and Latin America but less significant in the United States. Therapeutics was the leading manufacturer of treatments for multiple sclerosis, a degenerating and lethal disorder of the nervous system that had a strong presence in the United States. The key dimensions of Pharma's global organizational structure were corporate-level functions, business units, and geographical units. Business and geographical units shared the profit and loss responsibilities.

The global pharmaceutical industry was highly regulated (Arora et al., 2009; DiMasi et al., 2003; Ding & Eliashberg, 2002). According to regulatory prescriptions and industry

practices, Pharma's state-gate system for project development comprised five stages: a preclinical stage (A), followed by four stages (B–E) associated with regulatory-defined I–IV phases. The preclinical stage (stage A) involved conducting nonhuman studies on toxicology, carcinogenicity, pharmacology, compound stability, and determination of the manufacturing process. Phase I (stage B) involved conducting small-scale trials on healthy humans (20–50) to test pharmacology, drug effects, and dosage. Phase II (stage C) involved conducting controlled clinical trials with a moderate number of patients (30–300) to study the efficacy of the therapy. Phase III (stage D) involved conducting controlled clinical trials with various patients (300–3000) to study the safety of the therapy. Phase IV (stage E) involved conducting open clinical trials to detect possible rare side effects and to adjust for optimal drug use.

The state-gate system was sequential, such that a project had to complete successfully previous stages before entering the next stage in the sequence. Not fulfilling the regulatory criteria or meeting the targeted company's performance in some stages terminated further project development. Table 1 shows the general features of the stages and transitions of Pharma's state-gate system.

TABLE 1 The pharmaceutical state-gate system.

Stage code	Summary of development tasks	Requirement at gate to enter next stage	Other
A	Conduct nonhuman studies on toxicology, carcinogenicity, pharmacology, compound stability, and determine manufacturing process	Go to next stage if studies in stage A show reasonable safety to humans	Decide issues of chemical and manufacturing technology, and site of manufacturing
B	Conduct small-scale trial on healthy humans (20–50) to test pharmacology, drug effect, and dosage	Go to next stage if the pharmacological effect of the compound is according to expectations and meets regulatory requirements	Compile project plan to assess economic aspects and decide on product target profile, this is, what is the required level of efficacy and acceptable side effect pattern
C	Conduct controlled clinical trials with moderate number of patients (30–300) to study efficacy of the therapy	Go to next stage if the drug shows superior efficacy in comparison with placebo, fulfills target profile, and meets (therapy-specific and other) FDA regulatory requirements	Refine target profile in project plan
D	Conduct controlled clinical trials with large number of patients (300–3000) to study safety of the therapy	Go to next stage and file for new drug application if the comparison against placebo shows acceptable safety, fulfills target profile, and meets regulatory requirements	This stage is the most cost-intensive one. Regulatory approval follows if requirements have been met
E	Conduct open clinical trials to detect possible rare side effects and adjust optimal drug use	After regulatory approval, collected data from drug users are reported to regulatory authorities	Other studies may include controlled trial against other competitors in the same indication, or to document new indications

Source: Modified from the US government's FDA website https://www.fda.gov (November 24, 2017).

3.3 | Data collection

3.3.1 | Decision context

Pharma's corporate governance structure reflected German law and industrial relations. The dual governance structure included a supervisory board (Aufsichtsrat) and an executive board (Vorstand). The shareholders and employees elected the members of the supervisory board. The supervisory board determines the membership of the executive board (top executives effectively running the company). Members of the executive board (top management) reported to the chair (Vorstandsvorsitzender). German companies did not use chief executive officer nomenclature. In what follows, we use "top management" as a synonym for the executive board.

Top management established Pharma's RAP decision context in 1996. It encompassed three distinct levels: executive board (Level I), portfolio board (Level II), and project board (Level III).

The executive board (Level I) comprised the board chair and direct reports. Top management expressed Pharma's strategic intent by determining and controlling annual funding quota for resource allocation to the different business units in the corporate portfolio. The amount of funding reflected the strategic importance of the business unit. Total funding determined the number of new projects annually and total portfolio size. From the perspective of the B–B RAP process model, the executive board was responsible for proactively establishing the *incipient strategic* context of the favored-for-growth therapeutics business unit and determining the *structural* context, which signaled the selection rule for project prioritization to the portfolio board.

The portfolio board (Level II) consisted of top management representatives (board chair and corporate functional heads) and senior executives, including the heads of geographical units (the United States, Europe, and Latin America) and heads of the four business units. The portfolio board was a stable senior management coalition with few changes in membership over time. This board made four types of resource allocation decisions that determined a project's evolution. These included: (1) to initiate project funding and associated nonfinancial resources, (2) to end project funding after a successful launch or out-licensing, (3) to terminate project funding, and (4) to prioritize the project funding and associated nonfinancial resources of different business units based on the abovementioned selection rule of expected high sales and potential for global coverage. *Prioritization* escalated the commitment of non-financial and financial resources to strategically important projects from the corporate-level strategic perspective. *Termination* ended resource allocation to projects of different business units that were unable to complete a particular development stage and move to the next stage. From the perspective of the B–B RAP process model, the portfolio board was the strongest driver of the project-level *impetus* subprocess and linked it with the corporate-level innovation project portfolio, which strongly influenced the evolution of the incipient *strategic context* subprocess of the favored-for-growth business unit.

The project board (Level III) comprised the heads and R&D heads of the business units, representatives of various functional areas (e.g., project management, regulatory affairs, and manufacturing), and invited specialists. Members of this board, especially the leaders of the different business units, were intimately familiar with the product-market and medical-related resource aspects of the projects of their own business unit, and were important for proposing project initiation and associated nonfinancial resources for funding to the portfolio board. The project board was the strongest driver of the *definition* subprocess from the perspective of the B–B RAP process model. However, it also played an important role in the *impetus* subprocess because it expertly determined project development status and duration at each stage. If

a project failed at some development stage, the project board informed the portfolio board, which terminated the project funding.

Project 117 provides an example of the functioning of Pharma's RAP decision context. It was important in the strategy of the favored-for-growth therapeutics business unit to extend its product range for disorders of the central nervous system. In April 1999, the project board moved Project 117 to the preclinical stage A. In January 2000, the project board proposed moving it to development stage B (Phase I), a decision concurred by the portfolio board in March 2001. While still in stage B, the portfolio board assigned priority status to the project in April 2002, which involved an accelerated allocation of nonfinancial resources. With the updated project plan still pending, the portfolio board moved the project to stage C (Phase II) in April 2003. As budget cutting (due to flat company sales) became mandatory in 2003, the therapeutic business unit leadership expressed concerns that this might delay project development progress. To accelerate development, the portfolio board reconfirmed the project's priority status in September 2003, which involved maintaining the increased nonfinancial resources allocated at the time of prioritization. When stage C (Phase II) data became available, indicating a lack of efficacy of the project, the portfolio board terminated it in late 2005.

3.3.2 | Internal archival data about state-gate decisions

We studied the set of projects subject to review by the portfolio board and the executive board during the observational period for which initiation, prioritization, termination and market release data were available, which narrowed the analysis from 270 to 214 projects (79%).

We collected data on the evolution of business unit revenue and project spending (Table 2). Importantly, differences in project spending reflected differences in commitment of associated nonfinancial resources to a project. These included scientific personnel, research personnel in pharmaceutical and clinical trials involving sometimes thousands of patients worldwide, various established and new laboratory apparatus, construction of pilot production plants and their upscaling, and external subcontracted scientific and technical services.

Moreover, we collected data on the evolution of the composition of the corporate-level project portfolio during 1997–2005 (Table 3). Furthermore, we collected data on the prioritization of projects in the four business units during 1997–2005, terminations in the different development stages of prioritized projects of the four business units in the priority portfolio, and terminations in the different development stages of all projects of the four business units in the overall portfolio (Table 4).

Finally, we collected archival data on nonfinancial resource allocation to the 11 early-stage prioritized therapeutic projects, 9 of which (including Project 117) suffered early-stage termination (Section 3.4.3).

3.3.3 | Public archival data

Pharma's annual reports for 1996–2006 served as a primary data source to compare public statements of strategic intent during the research period with retrospective assessments of it on the part of the interviewed executives. We also reviewed other public data sources, including annual reports of major Pharma corporate shareholders and industry analyst reports. Additionally, we collected press information related to the acquisition of Pharma by XYZ in spring 2006

TABLE 2 Business unit revenues and R&D spending.

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
Sales Million €									
Therapeutics	978	991	1128	1402	1491	1637	1560	1546	1608
Gynecology	1075	1109	1173	1353	1510	1613	1622	1766	1979
Diagnostics	806	882	1040	1360	1452	1406	1312	1308	1404
Dermatology	210	189	199	221	227	217	200	202	223
Other	125	114	134	157	162	110	134	85	94
Total	3193	3285	3674	4493	4842	5023	4828	4907	5308
R&D Million €									
Therapeutics	183	223	219	229	283	327	354	330	406
Gynecology	118	114	127	164	172	175	162	170	175
Diagnostics	69	76	67	105	121	137	134	125	122
Dermatology	11	8	9	20	36	57	48	40	0
Other	0	0	44	51	40	59	76	80	98
Unallocated	188	207	218	293	295	169	185	237	225
Total	569	628	684	864	947	924	919	982	1026

Source: Pharma AG Annual Reports.

TABLE 3 Portfolio evolution 1997–2005.

Business unit	All projects	Projects 1.1.1997	Add initiations	Deduct terminations	Deduct launches	Deduct other	Projects 31.12.2005
Therapeutics	85	14	71	41	6	2	36
Gynecology	68	25	43	26	9	6	27
Diagnostics	44	8	36	24	6	5	9
Dermatology	17	1	16	13	2	2	0
Total	214	48	166	104	23	15	72

Source: Pharma AG archives.

and studied information provided by the acquiring company about the strategic rationale of the acquisition.

3.3.4 | Interview data about managerial agency in the RAP decision context

We collected retrospective interview data from 15 executives during 2013–2014. Access to high-level executives on a confidential basis was possible because of their familiarity with the second author. Owing to our confidentiality agreement, we disguised the names. Of the nine executive board members, six agreed to cooperate, including the last two executive board chairs. All six were also members of the portfolio board. The head of corporate R&D was the only executive and portfolio board member, who was also a member of the project board. Moreover, nine

TABLE 4 Project prioritization and termination summary data.

Actions	Project Development stage / Business unit	A B C Early	D E Late	All Early and late
Number of projects in the total portfolio	Therapeutics			85
	Gynecology			68
	Diagnostics			44
	Dermatology			17
	Total			214
Prioritizing actions in the total portfolio	Therapeutics	24	8	32
	Gynecology	13	12	25
	Diagnostics	7	8	15
	Dermatology	2	0	2
	Total	46	28	74
Termination actions in the total portfolio	Therapeutics	35	6	41
	Gynecology	22	4	26
	Diagnostics	18	6	24
	Dermatology	12	1	13
	Total	87	17	104
Termination actions in the subportfolio	Therapeutics	9	2	11
	Gynecology	3	1	4
	Diagnostics	0	6	6
	Dermatology	2	0	2
	Total	14	9	23

Source: Pharma AG Archives.

invited executives from different organizational positions agreed to participate. They were members of the project board or presented to the board (Table 5).

The second author interviewed all the participating executives in Germany and Finland based on the advice of the first author, who had extensive research experience interviewing top-level executives in many companies. We used our analysis of the archival data, in conjunction with general knowledge of project development in the pharmaceutical industry, to identify a priori eight strategic decision topics associated with Pharma's RAP and its outcomes. These topics, further identified below, served to structure the interviews without explicitly informing the interviewees about them.

The interviews evolved more as wide-ranging conversations than questionnaire-style data gathering. Getting interviewees deeply involved in recalling and articulating their actual experiences increased their level of interest (because they gained insights they may not have thought about before) and also increased the possibility that unexpected clues of potential importance for gaining deeper insight (on the part of the researchers) would emerge (Burgelman, 2011). The interviews lasted for at least 1 h. They were tape-recorded and a professional service firm

TABLE 5 List of interviewees and pseudonyms represented in Table 6 vignettes.

No.	Job title	Function and/or organizational position
1	Chairman of Executive/Supervisory Board—Dr. T	Board Chair (CEO equivalent)
2	Chairman of Executive Board—Dr. N	Board Chair (CEO equivalent)
3	Executive Board member—Dr. L	Head of Corporate Finance
4	Executive Board member—Dr. G	Head of Corporate Finance (successor to Dr. L)
5	Executive Board member—Dr. R	Head of Corporate Research and Development
6	Executive Board member—Dr. H	Head of Corporate Marketing
7	Head of Clinical Research—Dr. J	Therapeutics/Portfolio Board member
8	Head of Clinical Research	Gynecology Business Unit
9	General Manager	Region Europe
10	Country Manager	Region Europe
11	Marketing Manager	Region USA
12	Project Manager	Gynecology Business Unit
13	Project Manager	Gynecology Business Unit
14	Project Manager—Mr. O	Therapeutics Business Unit
15	Project Manager	Dermatology/Therapeutics Business Unit

transcribed them, resulting in 120 pages of data. To avoid leading questions, we did not use terms such as "co-selection bias" and "premature escalation of resource commitments" in the interviews. Together, the interview transcripts provided an approximate sequential but integrated sketch of Pharma's final RAP cycle informed by the interviewees' candid recall of their involvement.

3.4 | Data analysis

3.4.1 | Comparative state-gate resource allocation analysis

We examined nonpublic chronological records of resource allocation for 1997–2005 as primary state-gate data. We composed event histories to uncover the chronological evolution of resource allocation to each development project in each of the four business units (Gioia et al., 2013; Miles & Huberman, 1994). As there were a limited number of inconsistencies in the archival records, a few events may have remained unreported; however, this is unlikely to have significantly affected the analysis. Single projects were the object of decision-making in the state-gate system, but the evolving composition of the corporate-level subportfolio of prioritized projects was most fundamental for tracking the extent to which RAP outcomes continued to support top management's strategic intent.

Table 2 presents the comparative data collected on the evolution of the business unit revenue and development resource allocation.

It shows that therapeutics could not drive Pharma's growth during 1997–2005. Its revenue share declined from 32% (978/3069) in 1997 to 31% (1608/5214) in 2005 despite receiving an increase in development resources from 18.7% of its revenues in 1997 to 25.2% in 2005.

Table 3 reports the data collected about the evolution of the composition of the corporate-level development project portfolio.

It indicates that, in 1997, therapeutic projects constituted 29% of all business-unit development projects in Pharma's portfolio and increased to 50% by 2005. It had 71 project initiations (compared with 43 for gynecology and 36 for diagnostics), providing it 43% (71/166) of the total project initiations during 1997–2005.

Table 4 reports the comparative data regarding development project terminations in all stages of the different business units in the overall portfolio, terminations in all stages of prioritized project terminations in the corporate-level subportfolio of prioritized projects, and project prioritization in all stages of the different business unit for 1997–2005.

It shows several *similarities* across therapeutics, gynecology and diagnostics. First, project termination data in all development stages, combining data on the total number of projects for each business unit in Table 3, show that termination of all-stage therapeutic projects of 48% (41/85) is not systematically different from gynecology's 38% (26/68) and diagnostics' 55% (24/44). Second, it shows that the termination of all early-stage (non-prioritized) therapeutic projects of 85% (35/41) is similar to that of gynecology's 85% (22/26) and diagnostics' 75% (18/24). Third, the project prioritizations shown in Table 4, combining the total number of projects shown in Table 3, indicate that the prioritization of all-stage therapeutic projects of 38% (32/85) is similar to that of gynecology's 37% (25/68) and diagnostics' 34% (15/44).

However, our analysis reveals several *dissimilarities*. First, prioritization of early-stage therapeutic projects (75%, 24/32) is higher than that of gynecology (52%, 13/25) and diagnostics (47%, 7/15). Second, the termination of early-stage prioritized therapeutic projects (82%, 9/11) is higher than that of gynecology (75%, 3/4) and diagnostics (0%, 0/6). Third, the number of early-stage terminations of early-stage therapeutic projects (9) of the number of early-stage prioritizations of therapeutic projects (24), (38%, 9/24), is much higher than gynecology's 23% (3/13) and diagnostics' 0% (0/7). Early-stage prioritized therapeutic projects suffered a significantly higher early-stage termination rate than the prioritized projects of the other two major business units *because they were over-represented in the early development stages* relative to those of gynecology and diagnostics (24 vs. 13 and 7, respectively).

Furthermore, Table 4 shows that therapeutics, gynecology, and diagnostics have 21 (32–11), 21 (25–4), and 9 projects (15–6), respectively, in the corporate-level subportfolio of prioritized projects by 2005. This provides supporting evidence that the proactively established incipient strategic context of therapeutics, as the favored for-growth business unit, fizzled out.

In summary, the analysis of Tables 2–4, combined with public archival data, provides the foundation for our findings concerning the emergence of project-level co-selection bias and unanticipated maladaptive RAP outcomes for the favored-for-growth business unit in the corporate-level subportfolio of prioritized projects. Figure 1 shown below integrates these research findings.

3.4.2 | Analysis of managerial agency in the multilevel RAP decision context

We analyzed the interview data to examine the interlocking multilevel managerial activities that generated unanticipated maladaptive links between project- and corporate-level RAP outcomes. Table 5 presents the 15 interviewees and their undisclosed names.

First, as mentioned above, we selectively coded the data in terms of eight strategic decision topics that had guided the wide-ranging interviews (but had not been explained to the interviewees) regarding Pharma's final strategic resource allocation cycle. These included: (i) top management strategic intent, (ii) radically new medical-related capabilities, (iii) role of the three boards in the decision context, (iv) project initiation decisions, (v) project prioritization decisions, (vi) project termination decisions, (vii) forces constraining top management corrective action, and (viii) the situation top management faced in 2006.

Second, given the overlap in the involvement of multiple top and middle executives in most of these decision topics, the first author identified the individual quotes that seemed most salient in relation to the managerial activities that shaped the different strategic decision topics. This resulted in a 30-page summary of the most salient interview quotes organized in terms of the eight strategic decision topics.

Third, further analysis provided insight into the diverging views and rationales for actions taken or not taken and/or for views shared or not shared by executives from different board levels (executive, portfolio, project) and from different functional areas (R&D, marketing, finance, operations). Informed by this, the first author composed vignettes with representative quotes selected from the 30-page summary to highlight the role of managerial agency in Pharma's multilevel RAP decision context.

Finally, the second author independently reviewed and checked the chosen vignettes and representative quotes for potential misunderstanding of the transcripts and agreed with them, with the exception of minor terminological adjustments.

The eight strategic decision topic vignettes and representative quotes told a succinct story of Pharma's final strategic RAP cycle (Table 6).

Vignette (i) in Table 6 covers the start of the RAP cycle with top management's strategic intent to accelerate growth with therapeutics as the favored-for-growth business unit and to secure Pharma's independence. Vignette (ii) explains the radically new, difficult, and expensive medical-related capabilities necessary to accelerate therapeutic growth. Vignette (iii) concerns the roles of the three boards in the RAP decision context and the negotiations among their members based on imperfect project data. Vignette (iv) highlights therapeutic early-stage initiation decision-making that turned exploration (R) into exploitation (D), but often in fuzzy ways that created latent disagreement about transition timing and portfolio-level stretch at the portfolio board level. Vignette (v) covers crucially important project-level prioritization decisions and corporate-level portfolio composition outcomes. It also highlights the manifest disagreement between top-level executives and dominant role of Dr. R in these decisions. Vignette (vi) highlights the relatively undisciplined process involved in therapeutic project termination decisions, which resulted in the re-emergence of presumably terminated projects in later budget cycles; Vignette (vii) reports industrial relations and cultural forces that constrained top management's corrective action. Vignette (viii) reports poignant reflections by top management about the reasons for the takeover faced by Pharma in 2006, which ended the company's final RAP cycle.

Reflecting the interlocking managerial activities of members of the executive, portfolio, and project boards, these vignettes helped construct a B–B RAP framework that linked the project- and corporate-level outcomes of the development projects of the favored-for-growth business unit, shown below in Figure 2. This forms the foundation for our second main finding, showing how strategic incoherence in the corporate RAP decision context engendered co-selection bias and caused a corporate-level portfolio imbalance that in turn caused attenuation and fizzling out of the incipient strategic context of the favored-for-growth business.

TABLE 6 Pharma's final resource allocation cycle: Vignettes of managerial activity.

(***i***) ***Start of the cycle: Top management strategic intent***

Dr. T, head of the executive board during 1989–2001, recalled Pharma's entry into biotechnology:

> We invested in [the US] biogenetic research... Dr. R. [recruited from a university position in 1983] said, look this is the future ... We were the first company developing a completely new molecules for the treatment of multiple sclerosis. This was [I]. And [I]today is still one of the major, if not the major, product of XYZ (the acquirer of Pharma in 2006).

Dr. N, Head of the Executive Board during 2001–2006, observed: "Avoiding being taken over was one of the major goals of strategy." To meaningfully grow the company to realize this strategic intent, the top management decided to make therapeutics the favored-for-growth business unit because the company already had large market shares in gynecology and diagnostics. Dr. N explained:

> We could become a therapeutic specialist only in specialized therapeutic segments but with a global presence. And we decided to go this route. This was a decision that developed in the board in the second half of the 1990s... We were aware that oncology will be a major opportunity for technology-driven pharma markets. And therefore, we singled out oncology portfolio from the general therapeutics portfolio. [Note: general therapeutics encompassed Central Nervous System (multiple sclerosis) and cardiovascular diseases.]

Dr. L, the head of corporate finance, explained why therapeutics was chosen as the favored-for-growth business unit:

> Our feeling was that we had good established research knowledge in female health and diagnostics, and if we would get anything in addition it could only come from the field of therapeutics. It was really the desire to expand beyond the limits of contraception and diagnostics.

(***ii***) ***Radically new medical-related capabilities***

Dr. R, executive board member and corporate head of R&D explained:

> I came to Pharma in 1983 because this was exactly the time when [top management] decided that apart from diagnostics and fertility control, they wanted to enter new therapeutic fields like cardiovascular and central nervous system... And the reason to call me in was to build a new department for cardiovascular systems... The challenge was to rebuild the research activities and to take in the opportunities of what in those days we called biotechnology. Today I would rather call it molecular medicine. And this was a complete reorientation of our working procedures, of our models and everything.

Dr. R. explained why the executive board allocated 50% of its R&D budget to therapeutics.

> Therapeutics are more expensive. You need different numbers of patients and each patient you put into a trial is expensive. It's less expensive in diagnostics, and it's easier also in oral contraceptives... So it was the sheer need of the field which dominated.

Dr. H, executive board member and head of marketing, explained further:

> Therapeutics had complicated, very long-term trials. Our learning curve was at the beginning, and every project was a different substance so you had to do all the preclinical work, all the CMC work over and over again for each project. And you had a much higher failure rate. So in order to get a product to the market you had to waste a lot of money on products that never saw the light of day, and that made it more expensive.

TABLE 6 (Continued)

Dr. H highlighted the strong contrast between the new capabilities of therapeutics and those of other business units:

> Female healthcare and diagnostic imaging were extremely deeply rooted in the company. You had skills at every level for these areas. We understood the technology, the hormones very well, we understood the contrast media chemistry extremely well. So our research knew every aspect of this, and the clinicians had generations of experience in developing these products... In the other areas [Therapeutics] the skills were patchier.

(***iii***) ***Role of the three boards in the decision context***

Dr. N explained the inherent tensions in a complex decision context with the actual decision-making responsibilities split over multiple organizational levels:

> The Portfolio Board, in theory, was the strategic decision-maker. The Project Board was the operative board that had to coordinate operative realization of these decisions... The Project Board had to propose and the Portfolio Board had to accept.... There were always complaints coming out of the organization that decisions that were made in the Portfolio Board were not really implemented by either the Project Board or by functional heads ... of course there is always a tension with such split responsibilities.

Dr. G, executive board member and head of corporate finance (after Dr. L), explained how the portfolio board meetings were negotiation meetings between the geographical and business units, with the portfolio board serving as the controlling force. This indicated that in the early stages the numbers associated with projects were often inaccurate:

> So we had these discussions and we also had the data per project... But in the end, it was pretty much distributing like, Mr. X gets these projects and Mr. Y gets these projects... which is not necessarily bad, because these numbers were often wrong in the first place....

(***iv***) ***Development project initiation decisions*** (***from research to development***)

Dr. R., the only top-level executive who was also a member of the project board, explained how he considered the views of sales and marketing when deciding to move a project from research to development:

> All these discussions took place between research and development. And this led me to involve the development people much earlier in the process, not only for the decision process. They were then in from the beginning, in order to bring in their brains and see what research did... It was a decision primarily within research and development, with contribution of sales and marketing people early on.

He also said that in some fields, the company probably had several early development candidates but indicated how complex it was to find good innovative ideas in research that would be relevant for later development.

Dr. H confirmed that there were several project candidates but provided a somewhat different explanation:

> A lot of projects were what I would call “orchid projects” in the sense that they were small and fancy, and they wouldn't have the economic impact that the company needed. So I think we had more problems with the stretch of the portfolio than with the number of the projects... You would try and balance the portfolio altogether, because we didn't just look at the individual project we tried to look at the entire portfolio, and whether we have a balance between defending certain areas, expanding certain areas and creating new areas.

TABLE 6 (Continued)

Dr. L, head of corporate finance, expressed his view that the transition from R-to-D in therapeutics was systematically faster than for other businesses:

> In my opinion, we did not have enough [development] candidates, so had to invest more in pre-clinical research. We tried to prove the process of support and preclinical and clinical, and still from what I know today, our whole clinical development area was not yet such a [strong] development machine.

Mr. O, a project manager in therapeutics who presented to the project board, confirmed the following:

> The demarcation of research and product development projects [in Therapeutics] was sometimes a bit fuzzy...

(*v*) ***Development project prioritization decisions and portfolio composition outcomes***

Dr. N explained that the prioritization of projects was not rigorously enforced in the Pharma culture:

> The Pharma culture was not a culture that really enforced rigorous priority setting. Pharma had good but also not so good experiences with not being rigorous in such decisions.

Dr. G, with a legal background and later the head of corporate finance, provided a more strategic perspective on prioritization by linking it to Pharma's acquisition plans in therapeutics.

[We] said, okay, we want to go into oncology, and we are looking for candidates that we can take over, then obviously, everything that in our small portfolio which was suitable to build up an oncology department, these projects became priority projects. Dr. R. explained that corporate R&D function had to make the case for prioritizing projects as "corporate" projects in Portfolio Board meetings, and then continue to support this, twice or thrice a year, at meetings where the entire portfolio was discussed:

> These were the big meetings where sales and marketing, country heads, finance, R&D, were involved. R&D presented the case and made clear why we felt this should be a corporate project. Then we went to the portfolio (two or three times a year). There we had to take a stand and say why we still believed it was a corporate project or why we should rank it lower. This was a very careful and sometimes, for me, painful discussion, because they gave me fire like hell.

He also mentioned, consistent with Dr. N's observation, that he did not always concur with prioritization decisions related to early project development stages:

> In most cases, it worked. They were only a few cases where I did not obey. When I was lucky, then probably after 2 years, the priority was as I had hoped it would become. Sometimes I got fire because they realized that I did not do what they wanted me to do. And sometimes they were right. But in most cases, we were right in R&D.

He also pointed out, however, that a lot of time was spent intensively discussing projects that had to move to Phase II (stage C) or Phase III (stage D) because of the large amounts of money that were spent there. This seems to imply that prioritization of Phase I (stage B) projects may not have been discussed so intensely, which could be a major reason for why Therapeutics was able to get many early stage prioritized projects, given the difficulties associated with evaluating early promises of large potential sales in the US market.

Regarding balancing the portfolio in terms of the number of priority projects of different business units, Dr. R. stated:

TABLE 6 (Continued)

> We tried to have a balance because it all involved money. But if it was needed, we took out money here and gave it there. And we always discussed a portfolio for each business unit. But in the end, we discussed the full portfolio together. Then we looked at the quality of each project separately. If two Therapeutics came out and no Diagnostics, we left it like that. It could be very complicated.

Dr. H explained that his strategic perspective on developing the project portfolio differed significantly from that of Dr. R:

> There was a debate between Dr. R and myself, because he loaded more and more projects into this portfolio and I wanted to have less projects in the portfolio. And the difference really was what we defined as a project for the portfolio... I really wanted projects that were truly in the clinical phase, I didn't want exploratory projects in there.... I felt that sometimes Dr. R.'s effort of loading all these earlier things into the portfolio clogged our view, because it looked then very complete and very rich, yet I knew that a lot of these things would just disappear again, they wouldn't be there next year because they were still not defined enough.

Here, it is important to mention again that Dr. R. was the only top-level executive who was also a member of the project board, and was key to deciding when a project was ready to move from research to development.

Dr. H. felt that the process should be more disciplined:

> I felt there should be a lot more discipline to be brought to the process because I just didn't see how we would go on spending 18% of our sales on R&D and not getting enough out of it, because we didn't enough out of it... In the last year finally I got the board, all my colleagues, to agree and basically also Dr. R., that we would now design a new portfolio process which would be more stringent and especially also a little more number-driven. Because our process was more like an art; yes, we calculated the things and we said big and small, but we didn't really numerically try to craft it very well.

Mr. O., therapeutics project manager, confirmed both Dr. N's recall that the project prioritization discipline did not fit well with Pharma's culture and Dr. H's concerns about how the lack of discipline negatively affected the company's project portfolio:

> As to what counted when a project was prioritized, I did not see any specific or quantitative ways, evaluating development cost, future sales potential etc., to assess this.... But the list was there. Project priority status could and did change, due to external events, but sometimes, seemingly, even ad hoc.

He described the premature acceleration of resource allocation to a major therapeutics project:

> There were two major projects where much money had been spent, namely V in oncology and A in genomics/cardiovascular. By 2004, it was clear that they both failed. A was done in co-operation with a company that had direct access to our top management. With the consent of top management, to gain speed, phase III trials were started before results from phase II were known. The losses in 6 years were [several hundred] m€, and additionally the acquisition of that firm for [several hundred] m€... To sum up, we had spent some 1 billion € in 6 years.

He also said:

> I saw no fundamental long-term strategy saying... you had two big risky innovative projects which could have made fortunes easily as multi-billion products. But they both failed. This is the context where you would have needed strategic insight on what are you really trying to do.

TABLE 6 (Continued)

(*vi*) ***Development project termination decisions***

Dr. J, head of the clinical research of therapeutics and a member of the project board, noted that the termination process was not highly disciplined:

> If observations that suggested terminating decisions were explicit and univocal, then terminations were executed. But there were not necessarily explicit criteria set beforehand to distinguish between go and no-go decisions.

Dr. H confirmed the lack of discipline in terminating projects:

> At Pharma, if something didn't work they said "what can we do to maybe find an indication for this project?" And these projects would never die, they would be going on somewhere and people would still do work on them and try things out and come back.... I called this "cockroach projects," because we would kill them in one budget cycle and they would resurface in the next budget cycle...You switch the light on and they're all gone; you switch the light off and they all come out.

Dr. G, executive board member and head of finance, indicated the difficulties he faced in challenging R&D executives at portfolio board meetings:

> I had the feeling that very often we were doing a lot of projects in parallel, and I felt that was because we didn't have the stomach to say we kill this one or that one. It was hard to say I'm afraid we are having too many projects in parallel and that's why we are lacking the resources to really push one quick enough forward. Because then I would be asked to point at the one that I would be killing and take responsibility for killing it. And I didn't have the medical background or the marketing background to say that this project may be better than that one.

One top-level Pharma executive (unnamed here) who worked for several years at XYZ Company after its takeover confirmed Pharma's lack of discipline in terminating projects. Referring to a highly sophisticated oncology project that Pharma's Annual Report of 2005 mentioned as having been terminated, but on a later page seemed to allow to continue as a "restricted indication," this executive said:

> XYZ looked at it and said this is science, this will never make money, we'll just finish this trial and then we stop it. No more work was done on this and they dedicated all the resources to something different.

(*vii*) ***Industrial relations and cultural forces that constrained top management corrective actions***

One of our interviewees (anonymized) indicated the inertia associated with the imperative to maintain consensus among top management:

> The big question was: could [the Executive Board] make clear-cut changes by reallocating resources? ... With consensus-based decision making one could not significantly change internal allocation and focus.

Another senior executive (anonymized) confirmed:

> Is one capable of making reformations with regard to the established historical allocation of resources? In effect, continuance was dominant. It was unheard of to consider reallocations.

(*viii*) ***End of the final cycle: Takeover situation top management faced in 2006***

Dr. N, the last head of the executive board, explained why and how Pharma introduced a strategic initiative called "Focus" to increase both focus and discipline to keep the company independent

TABLE 6 (Continued)

> It was a strategy process, not a cost cutting process. We had strategic measures and projects, and we identified where our gaps were. We also set aside funds to fill these gaps. This created a lot of trust in the financial markets, so that the final result, if you look at 2004, 2005, Pharma was outperforming the market.
>
> We knew that this would buy time to implement our strategic measures. We wanted to utilize this time to work on the strategic gap that we had identified in oncology, to become a major player in oncology. And also showing a more competitive profitability to the financial markets. And by this ensuring Pharma's independence.
>
> But our bad luck was that there was this hostile bid from another company that put us in play. There was no pressure from the outside world that we couldn't have worked the next three, 4 years, in building successful portfolios. But you are never protected against bad luck...
>
> Suddenly, we were in play. And when XYZ approached us, after the ABC offer, [I believed] XYZ would be a much better business fit than the ABC-Pharma combination. I said yes, we want to assess this. The entire board unanimously said this is a better opportunity to assess. And we did a very speedy but deep assessment.... we also assessed whether going back to independence, promising something very, very much more attractive to the shareholders was impossible in the real world we were in. And therefore we said yes, this we have to recommend.

Dr. R, who also expressed the belief that Pharma had a bright future in 2005 recalled:

Therapeutic was probably not earning enough money. But this had a reason. With therapeutics we tried to become strong in United States. The American organization loved therapeutics, [But the US] is the most expensive market you can think of for marketing. And this combination, expensive field, demanding market, and United States made the therapeutic field less profitable. But the future, was really bright.

Reflecting on the strategic situation faced by the executive board in 2006, he stated:

> Some people on the Executive Board did no longer believe that Pharma had critical size.... My saying in the Executive Board has always been, there are only two ways to talk about critical size. One is, either you consolidate, or you get consolidated. And therefore I was having a lot of arguments to buy this or that company. It was not carefully enough reflected and this was not done. So, we became consolidated. And this is something I'm very angry about. We were a safe company, and all talking about pipeline is nonsense, because our pipeline saved at least the pharma section of XYZ [the acquirer] for 6 years. Make no mistake, XYZ was very clever in acquiring Pharma because we donated them time. They had a very early pipeline, and they needed the time to develop the pipeline, and we gave them the time. So for XYZ it was just perfect. .... And we were vulnerable...[In spite of our firewall] there was hardly any advisor in Germany, or in Europe, who did not know exactly how good Pharma really was, financially and product-wise. So, it was a no-brainer to acquire Pharma.

***Addendum*:** Press releases by XYZ Corporation confirmed Dr. R's assessment of pharma's strategic value: XYZ's acquisition of Pharma AG would create a healthcare company of international standing. It would be consistent with XYZ's strategic focus on profitable pharmaceutical specialties, and would increase these products' share of pharmaceuticals sales from currently [x] percent to around [x + 50] percent. The combined pharmaceuticals business would have a balanced portfolio of sound basic businesses and business units such as oncology, cardiology/hematology and gynecology that show above-average growth rates. XYZ believes the acquisition would further enhance the profitability of its health care business, which would have a combined sales volume of about €Y billion based on 2005 figures. It is therefore planned to increase the EBITDA margin of this business [by 6%] by 2009. It is also intended to raise the long term EBITDA margin target for the XYZ Group as a whole.

3.4.3 | Analysis of strategic RAP exploitation challenges

A comparative analysis of archival data revealed that 38% (9/24) of early-stage prioritized therapeutic projects experienced termination in the early stages, which was much higher than for gynecology projects (23%) and diagnostics (0%). This motivated further analysis of the medical-related capabilities allocation to the 11 terminated early-stage prioritized therapeutic projects, of which 9 were terminated in the early stages (Section 3.3.1). Table 7 succinctly reports our analysis (consistent with our NDA agreement without revealing the specifics of the medical-related capabilities).

The analysis of projects 109–119 indicates the lack of efficacy of various medical-related capabilities such as patient recruitment, gene therapy, clinical trials, production, management of costs, and timely progression (Table 7). This confirms the views of Dr. R (corporate R&D) and Dr. H (corporate marketing) (vignette (ii), Table 6) about the radically new and different medical-related capabilities required by the favored-for-growth business unit.

These analyses reveal RAP phenomena that have received little systematic attention. They concern the emergence of RAP *exploitation drive* and *exploitation capability deficits*, which may produce an RAP *exploitation trap* together. This RAP exploitation trap reduced strategic discretion and stymied top management's intent to keep Pharma independent when faced with XYZ, large suitor, keen to compensate for its own exploitation drive deficit in 2006. The addendum to Table 6 reports public statements from XYZ about its reasons for acquiring Pharma. Figure 3 shown below presents our novel framework for the strategic RAP exploitation challenges.

4 | MAIN FINDINGS

We present three theoretical frameworks (Figures 1–3) to conceptualize our main findings about *what* happened, *how* it happened, and *why* it happened in Pharma's final strategic RAP cycle.

4.1 | What happened: Co-selection bias emerges in the state-gate system

Figure 1 presents a theoretical framework that conceptualizes the challenge of maintaining strategic coherence in the multilevel RAP decision context, where each level responds to different external selection pressures. This shows that the external capital market, pharmaceutical ecosystem, and product-market force pressures, with internal decision context responses, exacerbated the unintended maladaptive outcomes of co-selection bias; that is, the unexpectedly low presence of therapeutic development projects in Pharma's subportfolio of prioritized projects by 2005, which caused fading corporate survival prospects, culminating in its acquisition by XYZ in 2006.

4.1.1 | Project-level co-selection bias engenders unanticipated corporate-level portfolio outcomes

A comparative analysis of archival state-gate project-level resource allocation outcomes revealed several similarities and important dissimilarities between therapeutics, gynecology and

TABLE 7 Emerging discrepancy between exploitation drive and exploitation capability.

Project and date	Prioritization of nonfinancial resource allocation to early-stage therapeutics projects and termination decisions
109 Pre-1997	At prioritization in stage **B** received internal resources for conducting proof of concept study, but it was put on hold owing to lack of bioavailability of the first candidate in humans. Revising the study later with a new molecule required capabilities of co-operation with the new partner providing the molecule. The start with the new formulation was, however, delayed due to, first, finding a new partner and, later, learning to work together. Although the new formulation was technically successful, large-scale clinical trials were long delayed to allow the newcomer to be competitive in the market. The capabilities for working with the new molecule were utilized late, leading to project termination in stage **C** (**Feb 2003**).
110 April 1997	At prioritization in stage **C** received capabilities for large-scale drug substance manufacturing, first, to conduct clinical trial program and, later, for manufacturing the product after regulatory approval. However, although the capabilities were properly utilized, lack of efficacy in pivotal clinical trials lead to termination of the project in stage **C** (**Jan 2001**).
111 April 1997	At prioritization in stage **C** was provided additional internal resources for developing clinical trial strategies, since earlier preliminary studies were promising, even though the mechanism of action remained unclear. Repeating earlier studies, however, did not reveal the mechanism of action, and it emerged that the safety profile, after all, was unacceptable in new Phase II studies. The internal resourcing was not satisfactory for developing the drug. For lack of finding a substitute, this resulted in terminating the project in stage **C** (**Nov 1998**).
112 April 1998	At prioritization in stage **A** received internal resources for building a new global manufacturing site. Later, for conducting pivotal clinical trials, more personnel resources for own research were granted. However, the cost of goods in the new manufacturing site were later estimated high, so the internal resources were insufficient for providing a solution to the problem, and the project was terminated in stage **D** (**April 1999**).
113 April 1998	At prioritization in stage **A** was granted capabilities for coping with new gene therapy technology and running clinical trials in short time. These capabilities however, were insufficient, causing slow recruitment of patients to the clinical program. This derailed clinical program schedule and led to termination of the project in stage **B** (**June 2004**).
114 March 2001	At prioritization in stage **A** was granted capabilities for co-development in repeating pre-clinical studies and swift drug substance manufacturing. The new preliminary studies revealed that mechanism of action in animal studies was not unique to humans. Since the trials documented unsatisfactory efficacy, the project was terminated in stage **A** (**Nov 2002**).
115 Nov 2001	At prioritization in stage **C** was granted internal resources to develop new capabilities for operating in the field of new technology. The study design was to run part of the earlier studies parallelly to minimize development time. Later, new internal resources were allocated to phase III clinical program. Results of Phase III pivotal trial showed lack of efficacy. Hence, the project was terminated in stage **D** (**June 2005**).
116 March 2002	At prioritization in stage **C** was allocated internal resources for co-operating with a partner and accelerate preliminary studies preparing for pivotal clinical trials. Phase II results before starting extensive trials were ended for safety reasons and the project was terminated in stage **C** (**June 2005**).
117 April 2002	At prioritization in stage **B** was granted capabilities for preparatory laboratory studies before starting clinical program. Later, in proof-of-concept studies, lack of efficacy was demonstrated. This finding lead to termination of project in stage **C** (**late 2005**).
118 April 2002	At prioritization in stage **A** was given expert resources for documenting new indications to an old product in preliminary trials. Studies revealed no better efficacy but defective side effect profile. This is why the project was terminated in stage **A** (**Sept 2002**).

TABLE 7 (Continued)

Project and date	Prioritization of nonfinancial resource allocation to early-stage therapeutics projects and termination decisions
119 Nov 2004	At prioritization in stage **A** was provided resources for choosing most suitable chemical formulation, conduct finding, and co-operating with new drug substance manufacturing. Subsequent development made it clear that the project development costs are high and the launch long delayed to guarantee the targeted expansion of current market presence. The resources were restricted for conducting the development. Therefore, the project was terminated in stage **A** (**Dec 2005**).

diagnostics. The comparative differences in project prioritization and termination indicated that the early-stage prioritized therapeutic projects suffered a significantly higher early-stage termination rate than the prioritized projects of the other two major business units because they were over-represented in the early development stages relative to those of the other business units (Section 3.4.1). This finding supports our abductive inference (Larson, 2021; Mantere & Ketokivi, 2013; Figure 1) that project-level co-selection bias engendered an unanticipated imbalance in the corporate-level subportfolio of prioritized development projects because of the smaller than anticipated number of surviving early-stage prioritized therapeutic projects.

4.1.2 | Differential external selection pressures exacerbate co-selection bias

Three different sources of external selection pressure (Figure 1) differentially affected strategic actions in the multilevel RAP decision context. First, listing on the New York Stock Exchange in 2000 exposed Pharma to US capital market pressure. Higher earnings and share prices were expected, and the executive board responded by initiating an emergency strategy thrust (called Focus) to increase profitability. Second, long-term pharmaceutical ecosystem trends of increasing development cost and price regulation made conducting project development expensive (DiMasi, 2001; DiMasi et al., 2003; Grabowski & Vernon, 2000) to which the portfolio board responded by reducing portfolio size and increasing the rate of early-stage development project prioritizations. Finally, these projects faced relatively more severe product-market selection pressures and many termination recommendations by the project board.

4.1.3 | Top management fails to correct for co-selection bias

As early-stage development projects are more likely to terminate, allowing even more new early-stage therapeutic projects to feed into the prioritization process could potentially compensate for co-selection bias. However, this required changing the agreed-upon budget quotas of different business units, and the associated human, equipment and production resource commitments. Figure 1 shows that top management did not change the budget quota owing to institutional and corporate culture forces.

4.2 | How it happened: Attenuation and fizzling out of the incipient strategic context

Figure 2, building on Figure 1, presents our B–B RAP framework to elucidate Pharma's final strategic resource allocation cycle. It shows how the interlocking multilevel managerial activities of the RAP decision context linked project-level co-selection bias outcomes in unanticipated ways to corporate-level innovation portfolio outcomes. This caused the proactively established incipient strategic context of the favored-for-growth business unit to *fizzle out* and stymied top management's corporate growth strategy.

The thick black lines depict the intense interaction between the portfolio and project boards in the project-level subparts of the process, the intense interaction between the portfolio and executive boards in the corporate-level subparts, and the bridging efforts of the portfolio board to link the project and corporate levels. The full line segments indicate the multilevel interlocking managerial activities that shaped the RAP process, and the numbers (**1**–**10**) indicate their sequential flow. (Note: The numbers 11 and 12 associated with the broken line segments in Figure 2 indicate more peripheral and less clear downward signals from the structural context subprocess and the relatively lesser role of the executive board, except for the corporate head of R&D (Dr. R), in the project-level definition subprocess.)

At the corporate level, the final RAP cycle started with the executive board proactively establishing the incipient *strategic context* of therapeutics as the favored-for-growth business unit (**1**), and expressing it in the *structural context* with a large development budget quota for therapeutics and a project prioritization rule emphasizing high sales and global coverage (**2**). This directed the portfolio board to retain as many as possible therapeutic projects in the subportfolio of prioritized projects (**3**) and exerted pressure on the project board members of the therapeutic business unit to generate a large number of projects (**4**). At the project level, the project board entered many therapeutic projects into the definition subprocess (**5**). The portfolio board considered them in the impetus subprocess for initial funding and disproportionality (relative to other business unit projects) for early-stage prioritization because of co-selection bias (**6**). The project board (**7**) reviewed all regular and prioritized projects for substantive pharmaceutical progress and recommended them for progress or termination to the portfolio board, with early-stage therapeutic projects disproportionally proposed for early-stage termination (**8**). Linking the project-level with the corporate context-level, the portfolio board was unable to deliver the anticipated number of prioritized therapeutic projects for the subportfolio of prioritized projects (**9**) and the executive board was unable to change the budget quota and take timely corrective action (**10**). This caused the attenuation and fizzling out of the incipient strategic context of therapeutics as the favored-for-growth business unit and concluded Pharma's final strategic RAP cycle.

Next, we use the representative quotes of the vignettes in Table 6 to explain in more detail the interlocking managerial activities at the executive, portfolio and project board levels in relation to the four subprocesses of the B–B RAP framework shown in Figure 2.

4.2.1 | Corporate level: Incipient strategic context of therapeutics starts the final RAP cycle

Dr. N (**vignette i**, Table 6) explained that the executive board proactively established the incipient strategic context subprocess for therapeutics-driven corporate growth (**1**, Figure 2). Dr. R

and Dr. H (**vignette ii**) indicate that this involved directing therapeutics to develop radically new medical-related capabilities to become leader in the new product-market categories related to oncology.

The portfolio board played a critical role in supporting the incipient strategic context subprocess because it expected to be able to ensure the entry of sufficient therapeutics projects into the sub-portfolio of prioritized projects. This would delineate a potentially winning strategic position for Pharma in specific segments of therapeutics, thereby helping the incipient strategic context of therapeutics to take hold (**3**, Figure 2). However, this was unsuccessful (**9**, Figure 2).

Although the project board was not directly involved in the strategic context subprocess, members associated with the therapeutics business unit (experts in the medical-related capabilities to be allocated) ensured that, commensurate with their large share of the development budget, many therapeutics projects entered into the project-level definition subprocess (**4**, Figure 2).

4.2.2 | Corporate level: Structural context engenders "out of context" responses

The executive board also established the structural context subprocess (**2**, Figure 2) favoring therapeutics with a high quota for Pharma's R&D budget (approximately 50%). Dr. R. in v**ignette** (**ii**) explains that this high R&D quota is justified because therapeutic projects require more complex and expensive new medical-related capabilities. Additionally, the structural context signaled to the portfolio board in the strategic context subprocess (**3**, Figure 2) *prospective high sales and global coverage* as the selection rule for project prioritization.

However, the signals sent by the structural context also caused "out of context" responses (Bower, 1970) because their perceived lack of clarity diverted or confused managers involved at lower levels in the process, in this case on the part of the portfolio board and project board in the project-level subprocesses. Mr. O. (**vignettes iv** and **v**) and Dr. J. and Mr. O. (**vignette vi**) in Table 6 confirm the lack of clarity at levels below the executive board.

4.2.3 | Project level: Definition confused by early transition from exploration to exploitation

While monitoring the evolving project development of different business units, the executive board, except for Dr. R. (**12**, Figure 2), was not involved in the project-level definition subprocess.

The portfolio board, considering the signals from the strategic and structural context set by the executive board, made confirming/disconfirming decisions associated with initiating new development projects, as recommended by the project board.

The project board is the most important in the definition subprocess because its members are deeply familiar with the medical-related capabilities and product-market aspects of the development projects defined by the different business units and are, therefore, crucial for proposing projects for funding upward to the portfolio board (**5**, Figure 2). Dr. R and Dr. H. (**vignette iv**) highlight the important role of Dr. R., who was the only executive board member of the project board. Dr. R. explains his rationale and approach for moving therapeutic projects from R to D sooner rather than later. However, Dr. H. indicates that many small (orchid) projects were pursued that could not significantly drive Pharma's growth and were likely to fail.

4.2.4 | Project level: Impetus marred by co-selection bias and weak termination discipline

The executive board ultimately ratified the therapeutics project prioritization and termination decisions of the portfolio board in the impetus subprocess, but, except for Dr. R, was not directly involved in business unit project-level decisions.

The portfolio board is most important in making project-level prioritization and termination decisions in the impetus subprocess (**6**, Figure 2). Regarding *prioritization*, the selection rule for prioritizing development projects established in the structural context—high sales expectations and potential global coverage—was to some extent inadvertently amended by adding early-stage development as a selection feature, especially for prioritizing therapeutic projects. Moreover, "global" became a synonym for "the United States," since the growth prospects for therapeutics were most prominent there (Dr. R. reportedly asserted that: "the three most important global regions for Pharma are the United States, the United States, and the United States"). The quotes from Dr. N, Dr. G, Dr. R, Dr. H, and Mr. O (**vignette iv**, Table 6) offer a candid report of the significant differences related to the effectiveness of prioritization decisions and their portfolio composition ramifications. In particular, Dr. H, explains that he disagreed with Dr. R regarding loading many early-stage projects into the portfolio and feels that the process lacked discipline. However, they also indicate that Dr. R. prevailed in the board's deliberations most of the time. Dr. G. (**vignette iii**) indicates that despite intense discussions of project data, in the end, the impetus process involved a negotiation process between interested senior executives, which he considers not necessarily bad because project numbers are often unreliable.

The project board is the most responsible in the impetus subprocess for checking whether a project has cleared all pharmaceutical-related criteria for moving to the next development stage (**7**, Figure 2). Therefore, this board confronts a high number of failures of early-stage prioritized therapeutic projects and recommends their termination to the portfolio board (**8**, Figure 2). Regarding *termination*, Dr. J., Dr. H., and Dr. G. (**vignette vi**) indicate that the portfolio board process lacked discipline. Dr. H mentions "cockroach" projects that reemerged after termination in a previous budget cycle, and Dr. G explains the challenges, given his lack of medical background, of indicating which projects to terminate.

4.2.5 | Corporate level: Fizzling out of the incipient strategic context ends the final RAP cycle

The B–B RAP analysis explains how strategic incoherence emerging in Pharma's RAP decision context caused a corporate-level subportfolio-level imbalance (**9**, Figure 2). Quotes from two (anonymous) executives in **vignette** (**vii**) confirmed that the executive board did not take corrective action with respect to the budget quota because maintaining top management consensus was imperative at Pharma. Failure to correct the corporate-level subportfolio imbalance caused the incipient strategic context of therapeutics, proactively established top-down at the start of the process and designating therapeutics as the favored-for-growth business unit, to fizzle out (**10**, Figure 2). This also ended Pharma's final resource-allocation cycle as an independent company.

4.3 | Why it happened: Emergence of an RAP exploitation trap

Building on the two vicious—failure breeds failure—cycles revealed in our B–B RAP analysis (Figure 2), Figure 3 helped explain *why* top management faced fading corporate survival challenges and was unable to maintain Pharma's independence.

First, Pharma's high rate of prioritization of early-stage development projects of the favored-for-growth business unit during 1997–2005 produced a strong exploitation drive. However, the high rate of early-stage termination of these early-stage prioritized projects indicated a weak exploitation capability, which revealed the lack of efficaciousness in learning to master the radically new medical-related capabilities allocated to these projects (Table 7). This combination of strong drive and weak capability created an exploitation *capability deficit* (upper left cell, Figure 3), corresponding to the vicious cycle comprising 6, 7, and 8 in Figure 2. Next, institutional and cultural forces prevented top management from changing budget quotas to increase further the number of prioritized early-stage projects of the favored-for-growth business, which caused a subsequent weakened exploitation *drive*. The strong initial exploitation drive hampered by a weak exploitation capability, followed by a weakened exploitation drive, engendered top management facing an unanticipated *exploitation trap* (lower left cell, Figure 3), corresponding to the vicious cycle constituted by 1, 3, and 9 in Figure 2, which limited top management discretion. Finally, top management's inability to secure in time an effective *exploitation balance* (upper right cell, Figure 3; 10, Figure 2) did not escape other major pharmaceutical companies, some of which faced an exploitation *drive deficit* (lower right cell, Figure 3) that could possibly be covered by acquiring Pharma.

This occurred in 2006 when XYZ acquired Pharma. Poignant recollections of several top-level executives (**vignette** (**viii**), Table 6) revealed lingering disappointment and sincere strategic opinion that Pharma could have continued as an independent company if given more time (presumably to learn to better master the radically new medical-related capabilities allocated to the favored-for-growth business). Chairman Dr. N. explained that he initiated the strategic "Focus" process to fill the remaining gaps to become a major player in oncology. However, it took too long. As Dr. R ruefully observed: "Make no mistake, XYZ was very clever in acquiring Pharma because we donated them time. They had a very early pipeline and needed time to develop the pipeline, and we gave them the time. For XYZ it was just perfect. .... And we were vulnerable..."

However, the reality of the situation was that XYZ was willing to pay a premium of 40% over Pharma's stock price. XYZ's explanation for acquiring Pharma (**Addendum**, Table 6) signaled the belief that their exploitation capability was sufficiently strong to overcome Pharma's exploitation capability deficit. One (anonymized) top-level Pharma executive, who worked for several years at XYZ after the takeover, confirmed this by referring to a highly sophisticated oncology project that Pharma's Annual Report of 2005 mentioned as having been terminated, but on a later page seemed to allow to continue as a "restricted indication." This executive said (**vignette** (**vi**), Table 6): "XYZ looked at it and said this is science, this will never make money, we'll just finish this trial and then we stop it... No more work was done on this and they dedicated all the resources to something different."

5 | DISCUSSION

5.1 | Contributions to strategic management theory of corporate resource allocation

First, our archival data findings (Tables 2–4 and Figure 1) produced new insights into the potentially maladaptive outcomes of state-gate systems related to the escalation of commitment

(Keil et al., 2000; McNamara et al., 2002; Schmidt & Calantone, 2002; Sleesman et al., 2018), and project termination challenges (Brockner et al., 1986; Cooper, 2008; Green et al., 2003). It identified the phenomenon of *co-selection bias* as a potential cause of unanticipated RAP outcomes, which are in real time often difficult to distinguish from unbiased, targeted outcomes (Kahneman et al., 2021). This corroborates previous findings that high uncertainty makes it difficult to disconfirm business cases in the early stages, which may lead managers to disregard early forecasts (Klingebiel & Esser, 2020). Our findings of low potential early-stage "orchid" projects getting funding and re-appearance of "cockroach" projects in budget cycles after presumed termination also provided further evidence of the strong potential for compromised resource allocation in state-gate systems (Klingebiel & Esser, 2020). These findings suggest that considering the possibility of co-selection bias in state-gate system theory may augment its explanatory power.

Moreover, we identified external selection pressures and ecosystem events (DiMasi, 2001; DiMasi et al., 2003; Grabowski & Kyle, 2007; Grabowski & Vernon, 2000) differentially affecting different levels in the multilevel RAP decision context. The resulting negative effects of project-level co-selection bias on corporate-level project portfolio evolution also indicated that achieving the benefits of combining resource allocation breadth and intensity in a corporate-level innovation portfolio (Klingebiel & Rammer, 2014) may be difficult if top management is constrained by external and/or internal forces. These unanticipated RAP outcomes provide further support for previous research that warned about the potential downsides of rigidly sticking to project-level state-gate processes (Sethi & Iqbal, 2002; Si et al., 2022).

Second, our interview data-based B–B RAP model findings (Table 6 and Figure 2) further explained how the multilevel RAP decision context shaped the evolving links between *micro*-level project outcomes of the state-gate system and *macro*-level innovation portfolio outcomes (Si et al., 2022). They confirmed that the structural context subprocess sometimes causes resource allocation decisions and actions that are "out of context" (Bower, 1970). They showed how the interlocking managerial activities of the three board levels produced vicious project- and corporate-level RAP cycles that caused attenuation of the proactively established *incipient* strategic context of the favored-for-growth business unit. Attenuation and fizzling out of a proactively established incipient strategic context is another possible reason why top management may face an unrealized strategy (Mintzberg & Waters, 1985). It adds to the set of modes of strategic context activation and evolution (successful or unsuccessful) identified in prior B–B RAP research (Bower & Gilbert, 2005; Burgelman, 1983, 1996, 2002b; Burgelman et al., 2023; Kannan-Narasimhan & Lawrence, 2018; Mirabeau & Maguire, 2014).

Our B–B RAP model findings elucidate the dispersion of relevant knowledge and commitments among the hierarchical levels and functional areas involved in the multilevel decision context that are often enacted simultaneously (Reitzig & Sorenson, 2013). They emphasize the impact of high-level management attention on containing escalation (e.g., Dr. H. vs. Dr. R. at Pharma) and confirm that the cognitive salience of project problems may amplify known biases of decision makers (Klingebiel & Esser, 2020), and less well-known ones such as co-selection bias. These findings suggest the continued usefulness of the B–B RAP model as a tool for examining the complexities of managerial agency in organizational resource allocation and for researching "progression" in temporal and sequential relating of microprocesses to macro-outcomes in strategy process research (Kouamé & Langley, 2018).

Third, our analysis of sources of corporate survival hazards associated with nonfinancial resource allocation (Table 7 and Figure 3) captures important but less systematically documented strategic RAP exploitation challenges. It shows that moving rapidly from

exploration (research) to exploitation (development) may create a strong exploitation drive but may also produce an exploitation capability deficit if not matched by commensurate exploitation capability. Exploitation capability may depend on the extent and speed of organizational learning (Burgelman & Chanda, forthcoming; March, 1991) Also, compensating for this by systematically increasing the number of early-stage development projects may unacceptably increase internal competition for resources (Ding & Eliashberg, 2002; Si et al., 2022). If top management faces constraints in compensating for the exploitation capability deficit by further strengthening the exploitation drive, this may lead to an *exploitation trap* subsequently.

Consequentially, our framework indicates the hazards of reduced strategic discretion and fading corporate survival prospects if top management experiences a strategic RAP exploitation trap. In the case of Pharma, this contributed to losing the privilege of remaining the "natural owner" of its assets and best equipped to maximize its business potential (Dobbs et al., 2009), when it was acquired by XYZ in 2006. This hazard is consistent with Ding and Eliashberg's (2002, p. 359) reporting the quote from Pfizer Chairman William Steele that, "Most of the mergers we have seen have been made out of weakness (in their pipelines)."

The main findings of our study also contribute, more generally, to the role of the internal ("artificial") selection environment in evolutionary organization theory (Burgelman et al., 2023; Levinthal, 2021). They underscore that balancing variation and selection (Kauffman, 1993) requires careful determination of when to move from variation (research) to selection (development) because this transition is often ambiguous and perceived differently by key actors in the multilevel decision context (Levinthal, 2021). They draw attention to the potential strategic dangers of over-extension in pursuing the *adjacent possible* (Burgelman & Shankar, 2022; Kauffman, 2000; Levinthal, 2021)—therapeutics in the case of Pharma.

Finally, they provide further evidence that RAP decisions may be adaptive, neutral, or maladaptive (Aldrich & Ruef, 2006), and that unexamined routine resource allocation may fail to anticipate ecosystem changes (Galunic & Weeks, 2002; Volberda & Lewin, 2003; Warglien, 2002).

5.2 | Generalizability and further research

Generalizations based on single case studies warrant caution. This leads us to acknowledge the limitations traditionally imposed on generalization in field research. However, acquisition events happening at the time of this writing concerning public pharmaceutical companies, such as Bristol-Meyers, AstraZeneca, Novartis, Merck (*The Wall Street Journal*, December 27, 2023, B3; and January 9, 2024, B1 and B2) provide initial corroborative support for the findings and insights of our field study.

Our findings about the potentially maladaptive consequences of co-selection bias in state-gate resource allocation systems, emergence of vicious cycles in the strategic B–B RAP decision context, and strategic RAP exploitation challenges indicate the continued need for further resource allocation research (Bettis, 2017; Maritan & Lee, 2017). Our theoretical frameworks, together, offer potentially useful directions for further RAP research to link and advance knowledge about state-gate systems, B–B RAP modeling and RAP exploitation challenges in novel ways.

6 | CONCLUSION

Our field study of an exemplary case of a corporate new business development RAP that stymied top management strategic intent and caused fading corporate survival prospects generated insights into *what* happened, *how* it happened and *why* it happened.

First, we find that co-selection bias associated with the disproportional prioritization of early-stage projects of a favored-for-growth business unit in the corporate RAP, combined with inefficacious project-level termination discipline and exacerbated by various unfavorable external selection pressures on managerial activities in the multilevel RAP decision context, may impede top management's anticipated outcomes. Second, we find that strategic incoherence of managerial activities may arise in a multilevel B–B RAP decision context and engender an unanticipated corporate-level innovation portfolio imbalance that causes attenuation and fizzling out of the proactively established incipient strategic context of a favored-for-growth business unit. Third, we find that the sequential combination of RAP exploitation capability and exploitation drive deficits may create an unanticipated RAP exploitation trap that limits top management strategic discretion and impedes maintaining company independence.

The frameworks that capture these insights constitute a novel theoretical lens that facilitates combining micro and macro aspects of the study of the strategic RAP associated with radical innovation-based new business development in established organizations in dynamic ecosystems.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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