Revisiting and Advancing Research on Strategic Change:

Three Essays on Antecedents and Performance Implications

Christian Kaiser

Doctoral Thesis

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Department of Business Administration and Economics

Justus Liebig University Giessen

Supervisors:

Prof. Dr. Andreas Bausch

Prof. Dr. Sven Kunisch

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Das Leben an sich ist ziemlich großartig.

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INTRODUCTION

In today's fast-paced and ever-evolving business landscape, strategic change is not merely an option but a necessity for firms striving to maintain competitive advantage, ensure long-term survival, and achieve superior performance (e.g., Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997; Zajac & Kraatz, 1993). Thus, strategic change is a fundamental tenet of strategic management. It encompasses the processes through which firms adapt to evolving market conditions, technological advancements, and competitive pressures (e.g., Ginsberg, 1988; Greiner & Bhambri, 1989; Kunisch, Bartunek, Mueller, & Huy, 2017; Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997).

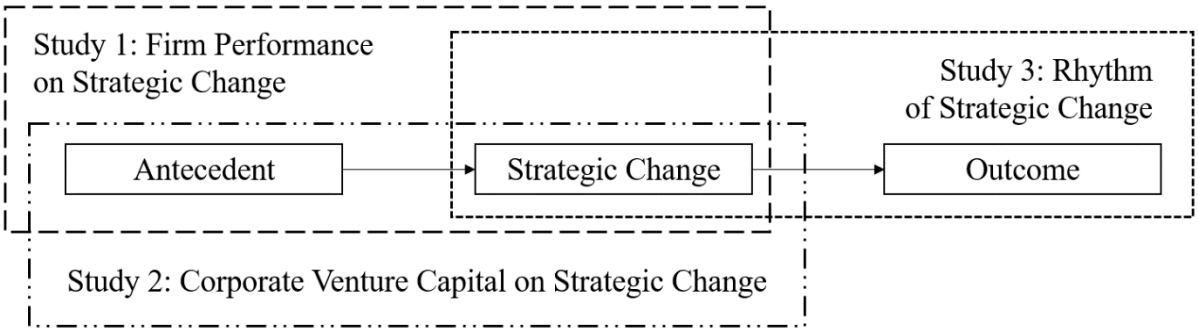
Nevertheless, the extant literature has extensively explored the phenomenon of strategic change, yet the findings remain inconclusive and fragmented. For instance, prior research has demonstrated that the influence of firm performance as an antecedent and consequence of strategic change is empirically inconsistent. Moreover, other potentially influencing factors, such as the influence of interfirm relationships on strategic change, have yet to be adequately investigated. However, this does not only refer to different influencing factors. A notable research disparity also exists in long-term research. Longitudinal studies are of great importance, as they provide insights into the temporal dynamics and long-term impacts of strategic decisions, thus facilitating a more profound comprehension of how strategies evolve over time. In light of the complexity and dynamism of modern business environments, a sophisticated comprehension of strategic change is essential.

This dissertation addresses the theme of strategic change in the literature by exploring various dimensions and contexts of strategic change through a cumulative approach. In accordance with the title, "Revisiting and Advancing Research on Strategic Change," this dissertation aims to enhance comprehension of the multifaceted nature of strategic change through three discrete yet interrelated studies.

The dissertation is structured around the three studies in Chapters 2 to 4. Each section represents a stand-alone scientific study centered on the overarching theme of strategic change. Consequently, each study offers a distinct and comprehensive perspective on the motivating factors, mechanisms, antecedents, or consequences of strategic change by applying different theories, methods, and data sources. The studies are presented in a journal style, encompassing a comprehensive analysis that includes an abstract, the motivation and research purpose, theoretical foundation, methodology, results, discussion of relevance and implications, and a critical evaluation. Figure 1 illustrates the relationship between the studies.

FIGURE 1

Relationship between the Individual Studies



Each study addresses a discrete issue within the field of strategic change literature. The initial study (Study 1) reexamines the influence of firm performance on strategic change, which has been the subject of considerable academic interest yet remains contentious. This study is based on the behavioral theory of the firm (Cyert & March, 1964). To examine this relationship, we present a conceptual extension that distinguishes between business strategic change, which involves adjustments within specific business units, and corporate strategic change, which encompasses broader organizational transformations such as mergers and acquisitions or divestiture.

It is based on a meta-analysis of 82 empirical studies, encompassing a total of 29,303 firms. Moreover, the study posits that the risk and temporal characteristics inherent in these types of changes, along with external environmental factors, moderate the relationship between firm performance and strategic change. This study contributes to a more contextualized and nuanced understanding of how firm performance impacts strategic change.

The second study (Study 2) investigates the role of corporate venture capital (CVC) in facilitating strategic change. In accordance with the tenets of interorganizational learning theory (Lane & Lubatkin, 1998), CVC is postulated as an interorganizational learning mechanism through which incumbent firms gain access to new technologies and markets. This study presents empirical evidence that CVC investments catalyze both product portfolio and geographic change, which are dimensions of strategic change. The evidence is based on examining a sample of 1,458 CVC units and 6,751 transactions. Moreover, it highlights that the effectiveness of CVC-induced strategic change diminishes when investments are made in ventures with high cultural or industry distance. This study advances the understanding of the interorganizational learning processes and their impact on strategic change.

The third study (Study 3) focuses on the dynamic aspects of strategic change, explicitly examining the rhythms of strategic change and their impact on long-term firm performance. Based on the change-stability framework (Klarner & Raisch, 2013) and entrainment theory (Pérez-Nordtvedt, Payne, Short, & Kedia, 2008), this study distinguishes between regular and irregular change rhythms. It employs data from S&P 500 firms to illustrate the superior impact of irregular rhythms on long-term performance. Additionally, it examines the moderating effects of temporal external contingencies, specifically industry dynamism and industry clockspeed, on this relationship. This study advances the field of strategic management by highlighting the importance of temporal alignment between strategic change rhythms and environmental characteristics.

Table 1 provides a comprehensive overview of the three essays, delineating their essential dimensions, including title, purpose, theory, methods, conceptualization, primary findings, and participation in conferences or presentations.

In conclusion, Chapter 5 synthesizes the studies' most significant findings and conclusions and analyzes the limitations of the studies. Additionally, it presents recommendations for future research.

The cumulative nature of this dissertation contributes to a comprehensive exploration of strategic change from multiple angles. By integrating diverse theoretical frameworks, including the behavioral theory of the firm, learning theory, and entrainment theory, as well as moderating perspectives and diverse methodological approaches, such as meta-analysis and text analysis, this research offers a comprehensive understanding of the complexities of strategic change. It addresses significant gaps in the existing literature on strategic change, offering a more comprehensive perspective on the conceptualization of strategic change. It examines the influence of performance and CVC investments on strategic change and its subsequent impact on firm performance. The findings offer significant implications for scholars and practitioners aiming to navigate and influence firms' strategic direction in today's rapidly evolving business landscape.

TABLE 1

A Comprehensive Overview of the Doctoral Thesis

	Study 1	Study 2	Study 3
Title	REVISITING THE RELATIONSHIP BETWEEN FIRM PERFORMANCE AND STRATEGIC CHANGE: A META-ANALYSIS AND CONCEPTUAL EXTENSION	CORPORATE VENTURE CAPITAL AS DRIVER OF STRATEGIC CHANGE? AN INTERORGANIZATIONAL LEARNING PERSPECTIVE	MOVE TO THE BEAT. BUT FOR REAL! HOW THE EXTERNAL ENVIRONMENT SHAPES THE RELATIONSHIP BETWEEN RHYTHMS OF STRATEGIC CHANGE AND FIRM PERFORMANCE
Research purpose	Reexamine the relationship between firm performance and SC by considering environmental influences of risk-taking and temporal aspects.	Examine the impact of CVC on SC by focusing on geographic and product portfolio strategic change and consider distance measures as moderators.	Reexamine the impact of SC rhythms on long-term firm performance by considering temporal external contingencies.
Theory	Behavioral theory of the firm	Organizational learning theory	Change-stability framework, entrainment theory
Method	Meta-analysis, meta-analytic regression analysis	Ordinary least square regression	Ordinary least square regression, text analysis, topic modeling
Conceptualization of Strategic Change (SC)	Differentiating in business and corporate SC	Differentiating in geographic and product portfolio change	Rhythms of SC along diversification-refocusing dimensions, topical change of a firm
Main findings	Poor firm performance is positively associated with SC. The relationship is moderated by temporal and risk-taking environment of the firm.	CVC activity is positively associated with geographic and product portfolio change. Geographic and industry distance are negatively moderating the relationship. CVC activity can be used as a learning instrument for SC.	Regular change rhythms harm long-term performance. Environmental characteristics moderate the relationship. SC can be measured using text data from annual files.
Conferences / Presentations	83th Academy of Management Conference 2023, Boston	5th BFGA 2023, Giessen ENTFIN 2024, Munich	Forschungswerkstatt FU Berlin, 2024

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STUDY 1:

REVISITING THE RELATIONSHIP BETWEEN FIRM PERFORMANCE AND STRATEGIC CHANGE: A META-ANALYSIS AND CONCEPTUAL EXTENSION

Christian Kaiser
(corresponding author**)**
Department of Strategic and International Management, Justus-Liebig-University
Licher Strasse 62, 35394 Gießen, Germany
Christian.Kaiser@wirtschaft.uni-giessen.de
Phone: +49 641 99 22438

Sven Kunisch
Department of Business Development and Technology, Aarhus University
Birk Centerpark 15, 7400 Herning, Denmark
skunisch@btech.au.dk
Phone: +45 871 66989

Andreas Bausch
Department of Strategic and International Management, Justus-Liebig-University
Licher Strasse 62, 35394 Gießen, Germany
Andreas.Bausch@wirtschaft.uni-giessen.de
Phone: +49 641 99 22430

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ABSTRACT

The purpose of this paper is to revisit the relationship between firm performance and strategic change. Despite vast scholarly attention, the empirical evidence regarding this relationship has remained inconclusive. We argue that a more explicit consideration of the role of risk and temporal characteristics can help resolve the conflicting findings. To do so, we distinguish between two types of strategic change with different risk and temporal characteristics: *business* and *corporate strategic change*. Moreover, we argue that risk-taking and temporal orientation in the external environment moderate the relationships between firm performance and strategic change. A meta-analysis of 82 empirical studies with 29,303 firms provides empirical support for our arguments. Our study advances a more nuanced and contextualized understanding of the relationship between firm performance and strategic change.

Keywords: strategic change, firm performance, behavioral theory of the firm, meta-analysis

INTRODUCTION

In the vast amount of literature on strategic change, perhaps no subject has received more attention than the relationship between firm performance and strategic change (for comprehensive reviews, see Ginsberg, 1988; Kunisch, Bartunek, Mueller, & Huy, 2017; Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997). However, the empirical evidence regarding this relationship remains inconclusive. While some studies suggest that poor firm performance is positively associated with strategic change (e.g., Boeker, 1997a; Gordon, 2000; Nakauchi & Wiersema, 2015), others yield empirical support for a negative relationship (e.g., Golden & Zajac, 2001; Wiersema & Bantel, 1992; Zhang & Rajagopalan, 2010), and some studies provide empirical evidence for both positive and negative relationships (e.g., Herrmann & Nadkarni, 2014). As a result, despite decades of research and a vast number of studies, scholarly knowledge about this important relationship remains ambivalent.

Against this backdrop, the purpose of this paper is to revisit the relationship between firm performance and strategic change by conducting a meta-analysis. Drawing on prior works, we conceptualize strategic change as a 'risky endeavor' that unfolds over time (e.g., Ahn, Cho, & Cho, 2021; Fang, Chrisman, & Holt, 2021; Kunisch et al., 2017; Müller & Kunisch, 2018). Accordingly, we conceptualize strategic change as an act of changing the course of action, which involves risk-taking and means that "a firm with a high level of strategic change not only differs greatly from its own past experience but also deviates from the industry's central tendency" (Zhang & Rajagopalan, 2010, p. 335). Thus, risk and temporal characteristics can be expected to play a key role in the nature of the relationship.

Indeed, recent research has highlighted the importance of risk and time for problemistic search and strategic change. For example, DesJardine and Shi (2021) emphasized that executives' risk-taking in making decisions related to behaviors such as mergers and acquisitions is shaped by their temporal focus, which impacts how they perceive and manage current and prospective wealth. Sobrepere i Profitós et al. (2022) highlighted that in

organizational decision-making, risk assessment is based on the magnitude and likelihood of outcomes. Furthermore, they found that aspects of upcoming performance evaluations influence risk-taking behaviors even more. Thus, we expect the need to consider risk and time more explicitly in explaining the equivocal empirical findings in the relationship between performance and strategic change.

Against this backdrop, we develop our arguments in three steps. In the first step, we propose a baseline hypothesis positing that poor firm performance is positively associated with strategic change. We ground our arguments in the key premises of the behavioral theory of the firm (BTOF; Cyert & March, 1963; Greve, 2003). Accordingly, poor firm performance calls for a change in a firm's course of action to avoid failure (Lages et al., 2008; Lant & Montgomery, 1987; Villagrasa et al., 2018). Thus, when firms face poor performance, they engage in a 'problemistic search' for better solutions (Cyert & March, 1963), which can be expected to trigger strategic change. We advance this baseline relationship by incorporating risk and temporal factors.

In the second step, we build on key premises in strategic change and strategy research and distinguish between two types of strategic change that conceptually differ in terms of risk and temporal characteristics: *business strategic change* and *corporate strategic change* (e.g., Ginsberg, 1988; Müller & Kunisch, 2018; Puranam & Vanneste, 2016). While the former is concerned with changes in the firm's business strategy (and thus corresponds to changes in the firm's unsystematic risk), the latter is concerned with changes in the firm's corporate strategy (and thus addresses systematic risk in terms of the firms' portfolio of business). This distinction highlights differences in terms of risk and time that can be expected to influence the nature of the relationship between firm performance and strategic change.

In the third step, we propose contingency hypotheses that account for heterogeneity in the external environment with respect to a firm’s risk-taking and temporal orientation. Building on related research into the role of cultural differences in organizational responses to poor

performance (e.g., Kotiloglu, Blettner, & Lechler, 2023; Kotiloglu, Chen, & Lechler, 2021), we develop theoretical predictions that explicitly consider risk and time and offer a more advanced understanding of this relationship.

To empirically test our arguments, we conducted a meta-analytical study. The aggregation of previous studies serves to increase the sample size and diversity, thereby enhancing the generalizability and reliability of the findings (e.g., Wegman et al.). Thus, it provides a basis for increased contextual analysis and a more comprehensive and statistically powerful understanding of a research topic. We used 110 non-aggregated effect sizes from 82 empirical studies covering 29,303 firms over the period of 1965 to 2023. Our analysis advances our empirical and conceptual understanding of the relationship between firm performance and strategic change.

This study offers three contributions. *First*, the study contributes to our understanding of the relationship between firm performance and strategic change (e.g., Herrmann & Nadkarni, 2014; Nakauchi & Wiersema, 2015; Zhang & Rajagopalan, 2010). While our study reveals a positive relationship between poor firm performance and strategic change, we also find differences between the two types of strategic change. In a similar vein, the findings draw attention to the importance of risk-related and temporal factors as important contingencies in these relationships. Thus, our meta-analysis helps disentangle previous research's conflicting and inconclusive findings regarding the relationship between firm performance and strategic change.

Second, our study contributes to the conceptualization and measurement of strategic change by distinguishing between two different types of change with distinct characteristics. While prior research has used a variety of different measures to capture strategic change (cf., Ginsberg, 1988; Kunisch et al., 2017; Müller & Kunisch, 2018; Zhang & Rajagopalan, 2010), little attention has been given to conceptual differences between different forms of strategic change. Our study reveals differences between the two types of strategic change in the

relationship between firm performance and strategic change and thus suggests that more scholarly attention to the differences between these two types is needed.

Third, the study broadly contributes to the BTOF (Cyert & March, 1963; Greve, 2003). More specifically, our findings suggest that the theoretical mechanisms of 'problemistic search' may be contingent upon external contextual risk- and time-related characteristics. By emphasizing the importance of risk and temporal factors, our study complements recent advancements in this area (e.g., Ciarleglio, Nair, Zhang, Fainshmidt, & Salaiz, 2022; Nagel, 2021; Smulowitz, Cossin, Massis, & Lu, 2023; Sobrepere i Profitós et al., 2022; Zhao & Xiao, 2023).

THEORY DEVELOPMENT AND HYPOTHESES

The term strategic change has been defined in various ways in the literature.[1] This lack of clarity leads to overlapping definitions of strategic change and other organizational change concepts, e.g., business model innovation (Asemokha, Musona, Torkkeli, & Saarenketo, 2019), reorientation (Keck & Tushman, 1993), or restructuring (Shen & Cannella, 2002). While strategic change tends to fundamentally affect key elements, these other forms often encompass a broader range of changes, some of which are not necessarily strategic and may be smaller in scale (Kunisch et al., 2017). Strategic change does not merely describe a superficial adjustment of existing practices or a routine update of operational procedures; instead, it goes beyond such incremental improvements to describe significant transformations in an organization's overall direction and approach. Rather than being a static, one-time event, strategic change is a continuous and dynamic process that requires ongoing adaptation and reevaluation in response to evolving internal and external environments.

We follow previous work and distinguish between strategic change and other, often smaller, forms of organizational change. Strategic change refers to the process through which a firm fundamentally alters its strategy and structure to adapt to internal and external environmental changes (e.g., Kunisch et al., 2017). Thus, strategic change involves a systematic

approach to repositioning or redefining the core aspects of a business to achieve a competitive advantage and meet evolving market and operational demands. This involves significant alterations in the allocation of corporate resources and the management of the organization's portfolio to better align with market trends and technological advancements, as evidenced by internal shifts in product or service offerings and those in diversification levels (e.g., Rajagopalan & Spreitzer, 1997; Schepker, Kim, Patel, Thatcher, & Campion, 2017; Wiersema & Bantel, 1992; Zhang & Rajagopalan, 2010).

We now develop our conceptual model and formal hypotheses in three steps. In the first step, we create a baseline hypothesis that posits a positive relationship between poor firm performance and strategic change. In the second step, we integrate the conceptual distinction between the two distinct types of strategic change and propose hypotheses for both. In the third step, we further develop the model by integrating two key contextual factors—temporal focus and risk-taking—that influence the relationship between poor firm performance and strategic change. Figure 1 summarizes our conceptual model.

Insert Figure 1 about here

Baseline Hypothesis

Our baseline hypothesis is built on the key premises of Cyert and Marchs' BTOF (1963; Greve, 2003) and postulates that poor firm performance is positively associated with strategic change. A decrease in performance signals the need to make changes to the manager's strategic decisions to address performance failure (Lages, Jap, & Griffith, 2008; Lant & Montgomery, 1987; Villagrasa, Buyl, & Escribá-Esteve, 2018). After the evaluation and realization of failure to meet internal or external expectations, the pressure to act increases. This occurs due to external stakeholders/shareholders or the ambitions and targets of the relevant manager. Thus, the basic idea is that firms and their decision-makers constantly evaluate firm performance and that poor firm performance triggers a problemistic search (Cyert & March, 1963).

Problemistic search "is stimulated by a problem (usually a rather specific one) and is directed toward finding a solution to that problem" (Cyert & March, 1963, p. 121). Consequently, when faced with an unsatisfactory situation (i.e., poor firm performance), firms engage in a search process to find alternative solutions and implement adaptive behavior over time to improve their performance (Cyert & March, 1963). Characterized by situations of incomplete information, bounded rationality, and inherent risks, it involves systematic exploration and adaptation to address uncertainties and challenges. Rather than with a predefined endpoint, it ends when an alternative solution to overcome poor firm performance is expected to be satisfactory (Posen, Keil, Kim, & Meissner, 2018). Thus, problemistic search is associated with strategic change.

On this basis and in line with prior research, we conceptualize strategic change as a form of risk-taking (e.g., Henderson & Fredrickson, 1996; Rajagopalan & Spreitzer, 1997; Sanders & Carpenter, 1998; Simsek, 2007). Risk-taking, the act of actively pursuing strategic change, refers to the extent to which managers engage in risky activities (Derecskei, 2018; Sanders & Hambrick, 2007).

Building on the key premises of the BTOF, we argue that poor firm performance is positively associated with strategic change. Poor firm performance can result from increased competition, market dynamics changes, or competitors' disruptive innovations (e.g., Lenz, 1981). Poor firm performance can push firms into a crisis mode in which immediate and profound changes are seen as essential for avoiding further deterioration or even completing business failure. In such situations, strategic change may be the only viable option for addressing the situation (e.g., Barker III & Duhaime, 1997). In response to existential competitive threats, firms often need to radically transform their core business to regain competitiveness rather than just incrementally adjusting its components (e.g., Hildebrandt, Oehmichen, Pidun, & Wolff, 2018; Wischnevsky & Damanpour, 2006). Thus, firms need to pursue strategic change. In addition, poor firm performance creates a sense of urgency within

an organization, thus generating a need for quick results. When the results are significantly below target values, management and stakeholders face higher levels of concern, leading them to take drastic action to correct the situation and pursue strategic change. On the basis of this line of argument, we propose the following formal hypothesis:

Hypothesis 1 (H1). *Poor firm performance is positively associated with strategic change.*

Two Distinct Types of Strategic Change

To advance this baseline relationship, we distinguish between two conceptually distinct types of strategic change: *business strategic change* and *corporate strategic change*. This distinction builds on prior strategic change and strategy research (Ginsberg, 1988; Müller & Kunisch, 2018; Puranam & Vanneste, 2016). Table 1 provides an overview of the key characteristics of the two types of strategic change.

Insert Table 1 about here

Business strategic change refers to changes in how firms compete in a given domain. This type of strategic change is focused on business strategy and business models and thus involves decisions regarding the allocation of a firm's resources to support its business units, projects, or product lines. Strategy scholars typically view this concept of reallocating resources, namely, business strategic change, as a significant source of competitive advantage (e.g., Carpenter, 2000; Zhang & Rajagopalan, 2010). Consequently, scholars have measured this type of strategic change as a shift in a firm's resource allocation across several strategic dimensions, such as advertising, R&D, plant and equipment, business administration, inventory, or financial structure (e.g., Carpenter, 2000; Finkelstein & Hambrick, 1990; Zhang, 2006; Zhang & Rajagopalan, 2010).

Corporate strategic change refers to changes in the domains in which firms compete (Ginsberg, 1988; Rajagopalan & Spreitzer, 1997). Corporate strategy refers to the overall scope

of the firm as a whole (Puranam & Vanneste, 2016). Therefore, corporate-level change refers to a realignment of a firm's selection of product/market domains and the allocations among them. This type of change involves making strategic decisions that significantly reshape the organization's overall business direction, objectives, and competitive strategies (Ginsberg, 1988). Consequently, scholars have defined strategic change as adjustments to the portfolio of a firm: "the evaluation of the appropriate courses of action with regard to potential divestments, downsizings, and restructurings of existing businesses, as well as to acquisitions, mergers, and the internal development of new business units" (Wiersema & Bantel, 1992, p. 93). Thus, corporate strategic change refers to changes in businesses (entering or exiting them) as well as changes in how to achieve synergies among different business units and how to allocate capital across them.

In sum, whereas *business strategic change* refers to changes in business-level strategies of business units, *corporate strategic change* refers to changes in a firm's business portfolio. While both types of strategic change are substantial, the scope and magnitude of change involved can vary widely (Pathak, Hoskisson, & Johnson, 2014). Business strategic change is typically less substantial than corporate strategic change, as fewer resources are involved in such activities, such as changing the firm's R&D spending strategy. Corporate strategic change, such as mergers and acquisitions (M&As) or divestitures, typically involves the binding or release of vast amounts of corporate resources.

Building on this differentiated understanding of the forms of strategic change and their defining characteristics, we focus on two specific aspects that are critical to strategic change: *risk-taking* and *time*. Both aspects support the distinction elucidated above.

First, the two types of strategic change differ in terms of the nature of their risk-taking: *unsystematic risk* and *systematic risk*. Business strategic change refers to decisions and actions that encompass changes within a specific business unit or market segment. These changes are typically focused on improving competitive positioning and performance within a particular

market (Ginsberg, 1988). Thus, business strategic change affects unsystematic risk, i.e., risks unique to a business and arising from firm-specific events. Unsystematic risk is determined by a firm's internal factors (Bansal & Clelland, 2004; Puranam & Vanneste, 2016). By adjusting firm-specific internal resources, changes in resource allocation can help reduce the level of unsystematic risk by optimizing a firm's internal resources and capacities. Therefore, business-level strategic changes aim to reduce unsystematic risk by optimizing internal resources, improving efficiency, and leveraging competitive advantages.

In contrast, corporate-level strategic change involves decisions that affect the entire organization, including multiple business units and market segments (Ginsberg, 1988). These changes are broader and often involve restructuring, mergers and acquisitions, or diversification into new markets or industries, i.e., changes in the systematic risk facing the firm. Systematic risk is associated with macroeconomic events that affect overall market movement and remains even after diversifying a firm (Bansal & Clelland, 2004; Puranam & Vanneste, 2016). Corporate strategic change thus refers to changing the systematic risk facing the firm by diversifying the firm's portfolio, thus decreasing vulnerability to industry-wide or economic fluctuations (Bansal & Clelland, 2004; Puranam & Vanneste, 2016). For example, an organization may mitigate the risk associated with market fluctuations by diversifying into different sectors or regions. Therefore, corporate-level strategic changes help manage systematic risk by diversifying the firm's portfolio across different industries, regions, or product lines.

Second, the two types of strategic change differ in terms of *time*. This includes the frequency of strategic change and the time required to implement strategic change. Frequency represents the rate at which changes occur within a given firm (Amburgey, Kelly, & Barnett, 1993). Previous research has demonstrated the impact of frequency on strategic change. For example, Reed (2022) finds that the frequency and magnitude of strategic changes are influenced by the level of turbulence experienced by firms. The study suggests that higher levels

of turbulence lead to more frequent and potentially larger strategic changes as firms adapt to rapidly changing conditions. In a similar vein, Klarner and Raisch (2013) propose that there is a relationship between the frequency and magnitude of strategic changes. They suggest that in periods of high environmental uncertainty or turbulence, firms may increase not only the frequency of their strategic changes but also the magnitude of these changes as they seek to adapt quickly to new conditions. Therefore, fundamentally, frequent strategic change is important for targeting environmental impacts. However, the extent of change can vary considerably (Zhang, Priem, Wang, & Li, 2023). Studies have also indicated that both the frequency and magnitude of changes influence the hazard rate of organizational failure. Thus, high-frequency and significant magnitude changes can disrupt organizational routines and stakeholder relationships, increasing the likelihood of failure in the short term (Amburgey et al., 1993). Accordingly, a change that is too frequent or too large might overwhelm the organization or dilute its focus (Klarner & Raisch, 2013). Therefore, changes need to be aligned accordingly: changes with greater magnitude need more time to implement than those with lower magnitude.

Corporate strategic change often involves lengthy periods of change activity. It entails complex negotiations, legal processes, and regulatory approvals (e.g., Harroch & Lipkin, 2014). In contrast, business strategic changes primarily entail internal decision-making and coordination. Consequently, it requires less extensive due diligence, which tends to be more straightforward. Additionally, while business strategic change can occur more often, corporate strategic change typically occurs less often because of the significant nature of changes in resource commitments.

Although it seems reasonable to assume that the conceptual differences between these two types of strategic change may influence the relationship between poor firm performance and strategic change, the specific theoretical mechanisms are less clear. Thus, we build on the same line of argumentation used for Hypothesis 1, which suggests that poor firm performance

is positively associated with strategic change. However, to test the theoretical predictions separately, we propose a separate hypothesis for each type of strategic change.

Hypothesis 2a (H2a). *Poor firm performance is positively associated with business strategic change.*

Hypothesis 2b (H2b). *Poor firm performance is positively associated with corporate strategic change.*

Contextual Factors: Temporal Focus and Risk-taking

In line with our conceptualization of strategic change as a risk-taking endeavor that unfolds over time, we argue that two contextual factors can be expected to influence the relationship between firm performance and strategic change: 1) the temporal focus and 2) the risk-taking of firms. Previous research has suggested that time and temporality play important roles in strategic change in general (e.g., Crossan, Da Vieira Cunha, Cunha, & Vera, 2002; Kunisch et al., 2017; Pérez-Nordtvedt, Payne, Short, & Kedia, 2008; Shipp & Cole, 2015) and in the implementation of strategic change specifically (Huy, 2001). Previous research has also suggested that risk-taking plays an important role in strategic change because firms significantly deviate from their past or even stray from the central core of their industry (e.g., Zhang & Rajagopalan, 2010). Therefore, we further advance our arguments by incorporating temporal focus and risk-taking as contingencies in the relationship between firm performance and strategic change.

Temporal focus. In the context of decision-making and planning, temporal focus refers to regarding time as a critical dimension in evaluating alternatives, making decisions, and setting goals (e.g., DesJardine & Shi, 2021; Nadkarni & Chen, 2014). Scholars typically distinguish time horizons into short- and long-term orientations (House, 2014; House, Javidan, Hanges, & Dorfman, 2002). The tendencies toward these temporal orientations are deeply rooted in and shaped by social culture, often leading to biased behaviors of firms (e.g., Geletkanycz, 1997; Hofstede, 1983; Hofstede, 2001; House, 2014).

A short-term orientation involves a consideration of the immediate consequences and outcomes of a decision. Such an orientation focuses on the near future and issues that require immediate attention or that have potential impacts in the near future. Therefore, a short-term orientation is closely related to the desire for instant gratification (House et al., 2002; House, 2014). Accordingly, firms operating in institutional environments with a short-term focus tend to prioritize immediate results and quick performance improvements (House et al., 2002; House, 2014). Because the scope of a project is correlated with its planning and execution time (Serrador, 2012), these results are typically achieved through minor, incremental adjustments. Therefore, when performance is poor, such firms can be expected to focus on immediate, often incremental changes to achieve rapid, visible improvements, which result in less strategic change.

Furthermore, firms in environments with short-term orientation prioritize quick results over continuous learning, limiting organizational learning and adaptation (Kim & McLean, 2014). Thus, such firms invest less in long-term learning and adaptation, which restricts their ability to respond effectively to performance issues. When performance is poor, these firms reinforce familiar and proven approaches rather than develop new strategies — this limited capacity for learning and adaptation causes less strategic change.

In contrast, a long-term orientation extends beyond the intermediate term and can encompass several years to decades or even longer. Long-term thinking involves considering the enduring impact of decisions on a firm's strategy, while it often pertains to sustainability, strategic planning, and long-range goal setting (House et al., 2002; House, 2014). Owing to cultural anchoring, firms operating in environments with a long-term orientation tend to pursue long-term goals (House et al., 2002; House, 2014). Consequently, they are willing to sacrifice short-term gains for long-term value enhancement, a concept known as patient capital (Choi, Kim, & Shenkar, 2023). Therefore, when performance is poor, these firms respond with profound strategic changes to safeguard their long-term objectives. These changes can include

restructuring the business model, investing in research and development, or entering new markets. For instance, a technology firm might persist in investing heavily in developing new technologies despite short-term losses to maintain its competitive position in the long term.

Consequently, within BTOF, firms within a long-term focused environment characterized by a culture of long-term vision, sustainable investments, and continuous adaptation are more likely to undergo strategic changes when performance is poor. This is due to their commitment to long-term goals, willingness to utilize patient capital, investment in learning and innovation, and strategies to create sustainable competitive advantages. Conversely, the emphasis on the immediate results, limited resources, constrained learning opportunities, and short-term competitive strategies of firms within a short-term focused environment render strategic changes less probable. On the basis of this line of argument, we propose the following formal hypotheses:

Hypothesis 3a (H3a). *Temporal focus moderates the relationship between poor firm performance and strategic change such that the relationship is stronger when the firm's external environment is characterized by a long-term rather than a short-term focus.*

Hypothesis 3b (H3b). *Temporal focus moderates the relationship between poor firm performance and business strategic change* such that the relationship is stronger when the firm's external environment is characterized by a long-term rather than a short-term focus.

Hypothesis 3c (H3c). *Temporal focus moderates the relationship between poor firm performance and corporate strategic change* such that the relationship is stronger when the firm's external environment is characterized by a long-term rather than a short-term focus.

Risk-taking. A central premise of the BTOF is that poor firm performance is associated with increased risk tolerance in the decision-making process and a greater propensity to take excessive risks (Sengul & Obloj, 2017). In this context, scholars distinguish broadly between risk aversion and risk affinity (Laux, Gillenkirch, & Schenk-Mathes, 2018). Risk affinity is characterized by an attempt to influence the future through increased responsibility and initiative. This includes innovation and creativity, and it is associated with a reduced need for rules and regulations (Hofstede, 1993). Conversely, risk aversion leads to the pursuit of

orderliness, consistency, structure, formal procedures, and laws to address a range of situations (House et al., 2002; House, 2014). Aspects of risk affinity and risk aversion are both embedded in and conditioned by social culture, and they can result in tendentious habits of firms (e.g., Geletkanycz, 1997; Hofstede, 1983; Hofstede, 2001; House, 2014; Li, Griffin, Yue, & Zhao, 2013). On an organizational level, risk preferences pertain to strategic matters such as systemic enhancements and realignments (Kacperczyk, Beckman, & Moliterno, 2015).

Consequently, in environments where risk-taking is encouraged, firms are more likely to embrace a culture of continuous learning and experimentation (Kim & McLean, 2014), allowing for a more extensive search process. This culture encourages employees to view errors as learning opportunities, promoting innovation, creativity, and openness to change, which supports a broad and intensive problem-solving strategy (Sadegh Sharifirad & Ataei, 2012). Consequently, firms operating in risk-affine environments seek solutions that may extend far beyond their current business areas, such as implementing disruptive technologies, entering new markets, or radically transforming their business models, thus increasing the likelihood of strategic changes.

In addition, risk affinity influences the accumulation of slack resources, thereby conferring greater buffers for firms in times of poor firm performance (Thompson, 1967). Consequently, firms operating in risk-affine environments flexibly deploy their slack resources to support new projects or strategic initiatives (Moses, 1992). For instance, a firm might invest in developing new technologies or launch an aggressive marketing campaign to regain market share. This willingness to leverage slack resources facilitates transformative responses to performance issues and enables the firm to undertake significant strategic changes.

In contrast, firms operating in risk-averse environments tend to pursue "limited" problemistic search. Risk-averse environments are characterized by a culture of security and caution, with a strong orientation toward traditional methods and proven practices. Consequently, a "limited" problemistic search describes a conservative approach to finding

solutions to performance issues, often focusing on well-established, low-risk alternatives (e.g., Posen et al., 2018). This cautious approach minimizes risks and prevents the firm from undertaking significant strategic changes, focusing instead on incremental improvements that do not fundamentally alter existing processes and structures. Consequently, in such firms, poor performance does not necessarily prompt significant strategic changes; instead, it often results in minor adjustments sufficient to stabilize performance.

In addition, firms in risk-averse environments perceive change as a threat rather than an opportunity (Alipour, 2019). This fosters the institutionalization of norms and processes aimed at stability and consistency within the firm (House et al., 2002; House, 2014). Such firms are often deeply entrenched in their existing structures and processes, which causes organizational inertia. Organizational inertia describes the tendency of firms to maintain existing structures, processes, and routines while resisting change (Hannan & Freeman, 1984). This inertia makes it challenging for firms to swiftly and radically pivot to new strategies in response to poor performance. The prevailing routines and culture of stability and continuity make firms hesitant to make comprehensive strategic changes.

Consequently, within BTOF, firms in risk-affine environments characterized by a culture of innovation, flexible leadership, and a willingness to mobilize resources for transformative initiatives are more likely to undergo strategic changes when performance is poor. In contrast, firms in risk-averse environments, marked by a culture of caution, stability-oriented leadership, limited problem-solving approaches, and organizational inertia, are less likely to make strategic changes and are less pronounced in their impact. On the basis of this line of argument, we propose the following formal hypotheses:

Hypothesis 4a (H4a). *Risk-taking moderates the relationship between poor firm performance and strategic change such that the relationship is stronger when the firm's external environment is characterized by risk affinity rather than risk aversion.*

Hypothesis 4b (H4b). *Risk-taking moderates the relationship between poor firm performance and business strategic change* such that the relationship is stronger when the firm's external environment is characterized by risk affinity rather than risk aversion.

Hypothesis 4c (H4c). *Risk-taking moderates the relationship between poor firm performance and corporate strategic change* such that the relationship is stronger when the firm's external environment is characterized by risk affinity rather than risk aversion.

METHOD

To test these hypotheses, we conducted a meta-analysis deemed to be a suitable method of integrating the results of previously conducted independent studies (Glass, 1976). Owing to its increased statistical power, this method enables researchers to provide insights into the actual value of the examined relationship (Zhao, Luo, & Suh, 2004). Compared with narrative reviews, meta-analyses are less biased because they are used to systematically and unbiasedly quantify the relationship between variables (Rosenbusch, Brinckmann, & Bausch, 2011; Schmidt & Hunter, 2015).

Sample and Data Collection

Following comparable studies (e.g., Holmes et al., 2021; Lee & Madhavan, 2010; Zhang, Dawson, & Kline, 2021a), we used multiple search strategies to identify existing studies on the relationship between firm performance and strategic change. *First*, we conducted an extensive literature search of the following electronic databases: Web of Science (SSCI), Google Scholar, JSTOR, and EBSCO. To avoid overly diverse studies, we used a narrow search approach with the key terms "strategic change" and "strategy change" combined with wildcards. *Second*, we consulted reference lists of previous reviews on this topic (e.g., Kunisch et al., 2017; Müller & Kunisch, 2018; Schepker et al., 2017; Tang & Liu, 2016; Wu, 2021). *Third*, we manually searched the most important academic management journals (e.g., Academy of Management Journal, Administrative Science Quarterly, Journal of Management, Journal of Management Studies, Organization Science, Strategic Entrepreneurship Journal, and Strategic Management Journal) and conference proceedings. *Fourth*, we attempted to identify additional

sources by backward tracing the references listed in the identified articles. We also used forward tracing to find all the articles cited earlier via Google Scholar and Web of Science (SSCI). This process yielded 5,298 articles published between 1965 and 2023.

Following the typical approach of previous meta-analytic reviews in assessing the adequacy of each identified study (Rosenbusch et al., 2011; Rubera & Kirca, 2012), we developed guiding rules to determine which studies should be included in the meta-analysis (Soares & Perin, 2019). Accordingly, (a) selected studies were required to address the relationship between firm performance and strategic change, (b) both variables were measured, (c) Pearson's correlation coefficient for the firm performance-strategic change relationship was provided, and (d) the sample size used in their analysis was reported. Studies that included multiple relevant correlations (e.g., different strategic change measures and multiple performance measures) were coded separately (e.g., Del Triana, García, & Colella, 2010). (e) Because our focus was on the causal relationship between prior performance and strategic change, we checked for study designs, names, and variable descriptions (e.g., for mentioned time lags) and selected only those variables that indicated the desired temporal direction. (f) Furthermore, we checked for change-implied measures. Therefore, we differentiated, e.g., between the level of diversification and the change in diversification over a specific period. This additional refined coding approach resulted in a dataset of 110 non-aggregated effect sizes *(k)* taken from 82 studies (Cheung, 2014).

Finally, to collect the data, we first manually extracted each correlation table via Tabula software and checked the output to avoid random errors that may have occurred during coding. Second, an algorithm selected each variable correlation relation from the extracted tables to eliminate input errors. Third, we clustered the selected variables according to their measurements, which resulted in the desired database. Appendix 4 provides a list of all the studies included in this study.

Measurements

Dependent variable: Strategic change. We find various measurements of strategic change in the literature. In general, we can distinguish between quantitative (e.g., Chatterjee & Hambrick, 2007; Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997; Haynes & Hillman, 2010; Wiersema & Bantel, 1992; Zhang & Rajagopalan, 2010) and qualitative (e.g., Boeker, 1997a; Herrmann & Nadkarni, 2014; Klarner & Raisch, 2013; Miles, Snow, Meyer, & Coleman, 1978; Smith & Grimm, 1987; Waldman, Javidan, & Varella, 2004; Zajac & Shortell, 1989) approaches to measure strategic change. In line with the study goal, this work is focused on quantitative approaches.

Types of strategic change. We operationalize two types of strategic change. First, *business strategic change* is defined as a change in resources, i.e., assets, financial quotas, product, and service alignment, and is operationalized by the variance in resources over a particular period (often one year). In addition, we include the resource allocation approach proposed by Finkelstein and Hambrick (1990), which is the dominant approach for measuring strategic change, its extensions (e.g., Carpenter, 2000), and its offsprings, e.g., "strategic variation and deviation" (Haynes & Hillman, 2010) and "strategic dynamism" (Chatterjee & Hambrick, 2007).

Second, *corporate strategic change* includes diversification (product, global, unrelated, related), M&A, and divestiture activities. These corporate activities are commonly measured via entropy indices (Jacquemin & Berry, 1979). As such, strategic change is defined as an absolute change in the degree of diversification of the firm (Wiersema & Bantel, 1992). Accordingly, the measurement includes a consideration of each business area's diversity and relative strength, whose change between two points in time represents the extent of strategic change (e.g., Boeker, 1997a; Wiersema & Bantel, 1992). Appendix 4 shows the distribution of the types within our sample.

Independent variable: Poor firm performance. In management research, multiple measures are used to capture performance (Combs, Crook, & Shook, 2005; Hamann, Schiemann, Bellora, & Guenther, 2013). To consider different aspects of performance, we further distinguish between two performance measures: *accounting-based* and *market-based* (Gentry & Shen, 2010). Following Combs et al. (2005)**,** we count performance indicators such as ROA, ROI, ROE, ROS, EBIT, cash, and cash flow as accounting-based indicators. In contrast, market-based measures include indicators such as TSR, Tobin's Q, the market-to-book ratio, and performance related to shareholders/stock, such as Sharpe, Treynor, and Jensen's alpha. Furthermore, following Richard et al. (2009), we add market share growth and the sales/revenue growth rate to the accounting measures and earnings per share to the market measures.

Temporal focus. To measure the influence of the environment on the relationship between prior performance and strategic change, we used data from Global Leadership & Organizational Behavior Effectiveness (GLOBE). GLOBE is a research project that focuses on understanding culture and leadership in 61 countries along nine dimensions (House et al., 2002; House, 2014).

Following prior studies (House et al., 2002; Venaik, Zhu, & Brewer, 2013), we used *future orientation* to capture temporal focus. Future orientation represents the degree to which individuals in organizations or societies engage in future-oriented behaviors such as planning, investing in the future, and delaying individual or collective gratification. This is related to the concept of short-term versus long-term orientation (House et al., 2002; House, 2014). To measure temporal focus, we used GLOBE country ratings and matched them with the countries of our primary studies (GLOBE Project, 2004). We reverse-coded the original value so that a low score in this dimension indicates the cultural tendency to invest in short-term projects rather than pursue long-term goals.

Risk-taking. To measure risk-taking, we followed prior studies (e.g., Frijns, Gilbert, Lehnert, & Tourani-Rad, 2013) and selected the *uncertainty avoidance* measure of the GLOBE project. Uncertainty avoidance measures the extent to which a society, organization, or group relies (and should rely) on social norms, rules, and procedures to alleviate the unpredictability of future events. The greater the desire to avoid uncertainty, the more people seek orderliness, consistency, structure, formal procedures, and laws to cover situations in their daily lives, which can be challenging in times of strategic change. Additionally, at the organizational level, high levels of uncertainty avoidance lead to a greater focus on short-term performance, which increases the need for feedback (House et al., 2002; House, 2014). In line with our first moderator, we calculated risk-taking by retrieving cultural data from GLOBE and matching them with the countries of our primary samples (GLOBE Project, 2004). For interpretation reasons, we also reverse-coded this variable, so the scoring indicates that the lower the score is, the lower the uncertainty avoidance of a culture. A high value represents risk affinity, whereas a low value represents risk aversion.

Fundamentally, the GLOBE dimension is focused on two different aspects of society: cultural practices, or "as it is," and cultural values, or "as it should be" (Hofstede, Hofstede, & Minkov, 2010). Because we are more interested in actual processes and behaviors than in aspired scenarios, we focus only on practical value.

Control variables. Following comparable studies, we controlled for several potentially confounding effects. First, we considered the *journal ranking* to control for publication bias: Journal rank is a binary variable measured along the individual journal h-index categories. Using this variable, we retrieved h-index data from SJR (SCImago SJR, n.d.), which ranged from 9 to 336 throughout the sample. Unlisted journals, such as working papers, were rated 0. We then transformed the rankings into ascending numbers. The variable was subsequently clustered into high–low values using the sample mean as the threshold.

Second, because *firm size* influences the risk-taking behavior of an organization (Wright, Kroll, Krug, & Pettus, 2007), we also considered this variable. Size was measured via a composite index of firm size indicators (e.g., commonly used total assets, total sales, or total number of employees as proxies for firm size). We created a composite measure of firm size by averaging the standardized scores of these variables. Min-max normalization was chosen to prevent the weighting of multiple effect sizes from the same study.

Third, to control for different types of firm performance (accounting- and market-based), we added the categorical variable *performance type.*

Finally, to control the magnitude of poor firm performance, we created a composite index of various performance indicators: the *performance mean* (e.g., accounting and market-based performance indicators, additionally separated into relative and absolute values). Min-max normalization was used to prevent the weighting of multiple effect sizes from the same study.

Analysis: Meta-analytic Procedure

We followed an approach taken in prior studies (e.g., Schmidt & Hunter, 2015). In the first step, we converted the correlation coefficients into Fisher's z coefficients (Rubera & Kirca, 2012). To counteract the influence of the expected heterogeneity, we subsequently performed a meta-analysis via the random-effects approach. Unlike the fixed effects model, which assumes homogeneous variance across the studies included in the meta-analysis, the random-effects model produces more accurate results when considering heterogeneous variance (Borenstein, Hedges, Higgins, & Rothstein, 2021; Lipsey & Wilson, 2009; Schepker et al., 2017). The amount of heterogeneity (i.e., τ^2) was estimated via the restricted maximum-likelihood estimator (Viechtbauer, 2005).

The homogeneity of the distribution of effect sizes was measured by Cochran's Q homogeneity statistic (Cochran, 1954) and Higgin's & Thompson's I^2 (Higgins & Thompson, 2002). If any amount of heterogeneity is detected (i.e., $\tau^2 > 0$, regardless of the results of the *Q*

test), then a prediction interval for the true outcomes is also provided (Riley, Higgins, & Deeks, 2011). Tests and confidence intervals were computed using the Knapp and Hartung method (Knapp & Hartung, 2003). Studentized residuals and Cook's distances were used to examine whether studies were outliers and/or influential in the context of the model (Viechtbauer & Cheung, 2010). Studies with a studentized residual of larger than $100 \times (1 - 0.05/(2 \times k))$th percentile of a standard normal distribution were considered potential outliers (i.e., using a Bonferroni correction with two-sided α=0.05 for k studies that were included in the meta-analysis). Studies with a Cook's distance that was more prominent than the median plus six times the interquartile range of the Cook's distances were considered influential. Both the rank correlation test (Begg & Mazumdar, 1994) and the regression test (Rothstein, Sutton, & Borenstein, 2005) were used to check for funnel plot asymmetry. These tests utilize the standard error of the observed outcomes as predictors. Furthermore, Egger's test, a measure used to check for publication bias within a sample (Egger, Davey Smith, Schneider, & Minder, 1997), did not indicate any occurrence of publication bias (Borenstein et al., 2021).

Additionally, we tested for multicollinearity, which means that one or more predictors in our regression model can be predicted by another predictor with high accuracy; therefore, the two predictors are highly correlated (Mansfield & Helms, 1982). Most of the dangers of multicollinearity are associated with the problem of overfitting, which is very common in meta-analyses because comparably small sample sizes tend to be used. High collinearity can cause our predictor coefficient estimates β to behave erratically and change considerably due to minor changes in the data. This also limits the extent of the variance that can be explained by the model (Berlin & Antman, 1994). Therefore, we tested for multicollinearity along the variance inflation factor (VIF). We chose a broadly acceptable threshold and set our cutoff point at 10 (Hair, Anderson, Babin, & Black, 2019).

To test our hypothesis regarding moderating effects, we conducted a meta-analytic regression analysis (MARA) using a mixed effects model (Gonzalez-Mulé & Aguinis, 2018).

To examine the significance of the relationships between variables, we calculated a 95% confidence interval. Significant results are present when there is no change in sign within the confidence interval boundaries and when the interval does not include the value zero (Borenstein et al., 2021; Lipsey & Wilson, 2009; Rosenbusch et al., 2011). To assess the robustness of our meta-regression models, we performed permutation tests. These findings support the accuracy of our models (Higgins & Thompson, 2004). We conducted the meta-analysis in R (version 4.1.2, R Core Team, 2020) using the metafor package (version 3.0.2; Viechtbauer, 2010).

RESULTS

We now turn to the results of this study. Table 2 provides a brief overview of the intercorrelations among our variables, and the results of our baseline hypothesis are shown in Table 3.

Insert Table 2 and Table 3 about here

Baseline Hypothesis

Our first hypothesis states that poor firm performance is positively related to strategic change. As shown in Table 3, 82 studies were included in the H1 analysis. The observed Fisher r-to-z-transformed correlation coefficients ranged from −0.2342 to 0.3541, with the majority of estimates being positive (63%). The estimated average Fisher r-to-z-transformed correlation coefficient based on the random-effects model was $\hat{\mu}$ = 0.0401 (95% CI: 0.0133 to 0.0668). Therefore, the average outcome differed significantly from zero ($t(80) = 2.9756$, $p = 0.0039$). According to the Q test, the true outcomes appear to be heterogeneous ($Q(80) = 315.0049$, $p < 0.0001$; $\tau^2 = 0.0094$, $I^2 = 76.7081\%$). A 95% prediction interval for the true outcomes is given by −0.1550 to 0.2351. Hence, although the average outcome is estimated to be positive, in some studies, the true outcome may be negative. According to Cook's distances, none of the studies can be considered overly influential (Viechtbauer, 2010). We used a funnel plot method to

assess the potential role of publication bias (Harbord, Egger, & Sterne, 2006). A funnel plot of the estimates is shown in Appendix 1. Neither the rank correlation nor the regression test indicates funnel plot asymmetry ($p = 0.6537$ and $p = 0.5450$, respectively).

Thus, the analysis provides empirical support for the baseline hypothesis (H0, $p < .01$). As a robustness test for the univariate analysis, we calculated H1 via the MARA approach. This analysis provides further empirical support for H0 (Table 5, Model 1).

Two Distinct Types of Strategic Change

Our second set of hypotheses refers to two conceptually distinct types of strategic change and posits that the relationships between poor firm performance and both business strategic change (H2a; *BSC*) and corporate strategic change (H2b; *CSC*) are positive for each type.

Insert Table 4 about here

According to H1, both effects are positive (Table 4). However, while the impact regarding business strategic change is significant ($p < .05$) and H2a is therefore supported, we do not find support for an impact regarding corporate strategic change. Therefore, H2b is not supported. Nevertheless, along with Borenstein et al. (2021), we find differences between the two groups at a low level of significance ($p_{subgroup} < .1$). An additional Fisher-Z test supports this finding. After Fisher's z-transformation and calculation of the z-statistic, a value of 2.64 was obtained. The resulting p-value of 0.0084 indicates that the difference between the correlations of the two groups is statistically significant (Cohen, Cohen, West, & Aiken, 2003). This affirms our expectation that the conceptual differences between the two types of strategic change, as measured by the correlation, are significantly stronger in BSC than in CSC. This result highlights statistically relevant differences in the correlations examined between the two subgroups.

As a robustness test for the univariate analysis, we calculated H2a and H2b via MARA by including the abovementioned control variables. As shown in Table 5, for Models 2a and 2b, this analysis further supports H2a ($p < .05$) and distinguishes between the two conceptual strategic change dimensions. Therefore, the intercepts of our subgroups (BSC and CSC) showed opposing values with a low significance level (Table 5, Models 2a and 2b).

In an additional robustness analysis, we test the independence of our primary samples by controlling for more sample-specific variables. Therefore, we added the number of companies per study and the sample period. We also included a country-related variable, testing for the USA, due to the excess number of US-based publications. By adding these controls, our analysis showed robustness for the full and business strategic change model. Concerning corporate strategic change, the added variables led to the overfitting of the model (Appendix 3).

Contextual Factors

In the following section, we present the results of the moderator analysis of the contextual factors of temporal focus and risk-taking. Table 5 displays the regression results.

Insert Table 5 about here

Temporal focus. Our third set of hypotheses posits that temporal focus moderates the relationship between poor firm performance and strategic change (H3a-c). First, we tested the moderating effects using our full model (Model 3a). We find significant support for our full model (3a; $p < .01$). Therefore, H3a is supported. Second, we analyzed the impact of contextual factors on business strategic change (Model 3b) and corporate strategic change (Model 3c). For *BSC*, we find a significant negative effect of future orientation at the same significance level (3b; $p < .01$), which confirms our previous finding. Therefore, H3b is supported. However, we have not found a significant effect on *CSC*. Therefore, H3c is not supported.

Risk-taking. Our last set of hypotheses posits that risk-taking influences the relationship between poor firm performance and strategic change. Again, we first tested the moderating effects using the full model (Model 4a). We find significant support for our full model (4a; $p < .01$). Therefore, H4a is supported. Furthermore, we tested our two types of strategic change: business strategic change (Model 4b) and corporate strategic change (Model 4c). Regarding *BSC*, we find a significant positive effect of risk-taking (4b; $p < .05$). Therefore, H4b is supported. However, we have not found a significant effect on *CSC* (4c). Therefore, H4c is not supported.

As a robustness test, we calculated both variables as dichotomous with high and low values using the sample mean of their GLOBE score as a cutoff point. The results are comparable to those obtained previously (Appendix 2).

DISCUSSION

This comprehensive empirical study aims to advance our understanding of the relationship between firm performance and strategic change. To this end, we developed a conceptual model by building on the BTOF (Cyert & March, 1963; Greve, 2003). Inherent in risk-taking and temporal focus, we differentiate between two distinct forms of strategic change: *business strategic change* and *corporate strategic change*. Furthermore, we advance these relationships by incorporating temporal focus and risk-taking as key moderating factors. To test our theoretical predictions, we conducted a meta-analysis of a sample of 110 non-aggregated effect sizes from 82 empirical studies covering 29,303 firms from 1965 to 2023.

Our study provides several notable insights. First, we find empirical support for a positive relationship between poor firm performance and strategic change. Second, we divide strategic change into two conceptual types, namely, business strategic change and corporate strategic change, and find significant differences between them. From our empirical test, we even find opposing reactions to poor firm performance. Third, we examine the influence of temporal focus and risk-taking on the relationship under consideration. Temporal focus

influences the relationship such that long-term-oriented firms exhibit more significant strategic change, whereas risk-averse firms exhibit less change in response to poor firm performance. Furthermore, we test these influences on each conceptual type. We confirm our finding for the former type but do not find significant evidence to support the latter type.

Contribution to the Literature

This study offers two sets of contributions: one for the strategic change literature and one for the BTOF literature.

Strategic change research. First, we contribute to the strategic change literature (e.g., Herrmann & Nadkarni, 2014; Nakauchi & Wiersema, 2015; Zhang & Rajagopalan, 2010) by helping disentangle the conflicting and inconclusive findings of previous research. Prior studies have found inconclusive empirical results regarding the relationship between firm performance and strategic change. Some studies have revealed a negative relationship between firm performance and strategic change (e.g., Boeker, 1997a; Gordon, 2000; Nakauchi & Wiersema, 2015), while others have revealed positive relationships (e.g., Golden & Zajac, 2001; Wiersema & Bantel, 1992; Zhang & Rajagopalan, 2010), and some have even shown opposing relationships (e.g., Herrmann & Nadkarni, 2014). In this study, we aggregated the results from 82 previous empirical studies and provided a comprehensive overview of the various extant findings. Therefore, our study shows that across all samples, there is a positive baseline relationship; thus, poor firm performance is found to influence strategic change significantly positively.

Second, we contribute to the conceptualization and measurement of strategic change by distinguishing between different types of strategic change along the dimensions of risk-taking and time. Our research includes a theoretical and empirical distinction between two conceptual types of strategic change: business strategic change and corporate strategic change. Prior research offers a variety of different conceptualizations of strategic change. However, empirically, little attention has been given to distinguishing between different types of strategic

change. There are conceptual distinctions made in prior research, e.g., strategic variation and deviation (e.g., Carpenter, 2000; Haynes & Hillman, 2010), the degree of related and unrelated diversification (e.g., Kunisch, 2017), and product market and geographic market diversification (e.g., Westphal & Fredrickson, 2001). Nevertheless, these are based on the same basic construct. Thus, strategic variation and deviation are based on resource allocation, and diversification is based on portfolio changes. The few studies that include empirically different measures do so for the purpose of ensuring robustness (e.g., Oehmichen, Schrapp, & Wolff, 2017).

In contrast to the extant findings, this analysis helps to improve our understanding of the distinction between these two concepts in an overall context. By categorizing these measures, we showed that strategic change differs from conceptual differences. By framing each concept via temporal and risk-taking factors, we enhanced the discussion regarding potential driving factors. While underscoring that the relationship between poor firm performance and strategic change is not as simple as we thought, we were also able to fuel the conceptual debate by contributing to the empirical comparison of the study results. This distinction could prove helpful for future research regarding the analysis of strategic change processes or the effect of strategic change on firm performance.

Behavioral theory of the firm. Concerning the mechanisms underlying BTOF, our study also contributes to prior research on the influence of time and risk on the relationship between poor firm performance and strategic change. While risk and time are undoubtedly intertwined with various aspects of both theories, prior research has either not explicitly focused on these aspects (e.g., Gavetti, Greve, Levinthal, & Ocasio, 2012; Kotiloglu et al., 2021) or focused solely on one of the two factors (e.g., Bao & Cardoza, 2023; Sobrepere i Profitós et al., 2022). Consistent with the findings of current studies that consider both risk and time (e.g., Ciarleglio et al., 2022; DesJardine & Shi, 2021; Zhao & Xiao, 2023), we noted that the classical

predictors appeared to be overly simple and that context matters. In addition, we complete this picture by deriving these factors as cultural issues.

Therefore, we analyzed the moderation effects of culturally influenced temporal focus and risk-taking orientation and found a significant impact. While we acknowledge that time is an essential element of corporate actions, maintaining a temporal focus is nonetheless crucial for the extent of activities. The same occurs with our second moderator. While strategic change is embedded in the sphere of risk and risk-taking, the attitudes of organizations toward risk and risk-taking are crucial.

However, through this more fine-grained analysis, we also arrive at a limited general statement: a comparison of the types of strategic change shows that these cultural orientations affect the relationship regarding only one of the two types of strategic change, namely, business strategic change. Therefore, while the emergent decisions made daily might be subconsciously influenced by institutional contexts, the deep and thoughtful planning of projects seems to cancel out this effect. Furthermore, this study contributes to opening a discussion regarding the potential further factors that influence the examined relationship.

Implications for Practice

This meta-analytical study has several implications for practitioners. First, the study confirms that poor firm performance is positively associated with strategic change. Strategic change represents a firm's departure from its existing structures and systems. Therefore, practitioners should view poor firm performance as an opportunity to innovate and reorient the firm's direction. This should be done by initiating problem-focused searches to identify and implement effective changes.

Second, distinguishing between business strategic change and corporate strategic change is important. Business strategic change involves specific modifications to a particular business unit, whereas corporate strategic change encompasses broader organizational adjustments such as mergers and acquisitions. While poor firm performance is a contributing

factor to an increase in strategic change, our findings indicate that this effect is more pronounced in the case of business strategic change. However, our post-hoc test reveals a negative effect on corporate strategic change. Understanding this distinction is crucial for informed decision-making about resource allocation and strategic priorities. Implementing tailored strategies on the basis of the specific type of change required can effectively address performance issues.

Third, practitioners must be aware of the environmental context in which their firms operate. Risk-taking and temporal focus influence the relationship between poor firm performance and strategic change. With respect to temporal focus, we find that firms operating in environments with a short-term orientation tend to initiate less strategic change in response to poor firm performance than those with a long-term orientation do. Furthermore, corporate decision-making can be either risk-averse or risk-averse. Firms in risk-affine environments tend to initiate more strategic change in response to poor firm performance than firms in risk-averse environments do. However, this external influence of temporal focus and risk-taking is evident only in the dimension of business strategic change. These environmental effects disappear with thoughtful, planned corporate strategic changes.

By considering these practical implications, managers can better navigate the complexities of strategic change, fostering a more resilient and adaptive organization capable of thriving in dynamic environments.

Limitations and Future Research

We acknowledge the following limitations of this study, which set the stage for future research avenues. The first limitation is the choice of methodology. Despite our consideration of the primary study designs and potential lag structures, examining the correlation coefficients of a relationship always carries the risk of endogeneity because relevant variables may cause severe distortions, and they cannot be controlled within this analysis.

We also acknowledge two limitations concerning contextual factors. First, future research can examine the within-country variance in cultural aspects. Previous studies have shown that most value differences occur within a country, debunking the idea that national borders neatly contain distinct cultures (Kirkman, Taras, & Steel, 2016). Second, we acknowledge that many studies have used America as an empirical context. This leads to a reduced variance in cultural variables in our sample. Hence, we see many opportunities for future research to investigate potential similarities and differences across various cultural, institutional, and sociopolitical contexts. Our study shows that contextual variables can be important in the relationship between firm performance and strategic change.

Conclusions

In this paper, we set out to resolve the conflicting findings in the extant literature regarding the relationships between poor firm performance and strategic change and to advance our understanding of this relationship. Our study highlights the importance of a more nuanced understanding of strategic change as well as the important roles of risk and time factors in the relationship between poor firm performance and strategic change. Overall, we hope that this study stimulates future research on strategic change.

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ENDNOTE

1 While several terms are sometimes also used interchangeably e.g., strategic transformation, strategic renewal, strategic variation, strategic deviation, corporate refocusing, strategic dynamism), some are defined differently (e.g., strategic experimentation, strategic adjustment, strategic flexibility) (e.g., Carpenter, 2000; Chatterjee & Hambrick, 2007; Huff, Huff, & Thomas, 1992; Nicholls-Nixon, Cooper, & Woo, 2000; Pathak et al., 2014; Snow & Hambrick, 1980).

FIGURES AND TABLES

FIGURE 1

Relationship between Firm Performance and Strategic Change

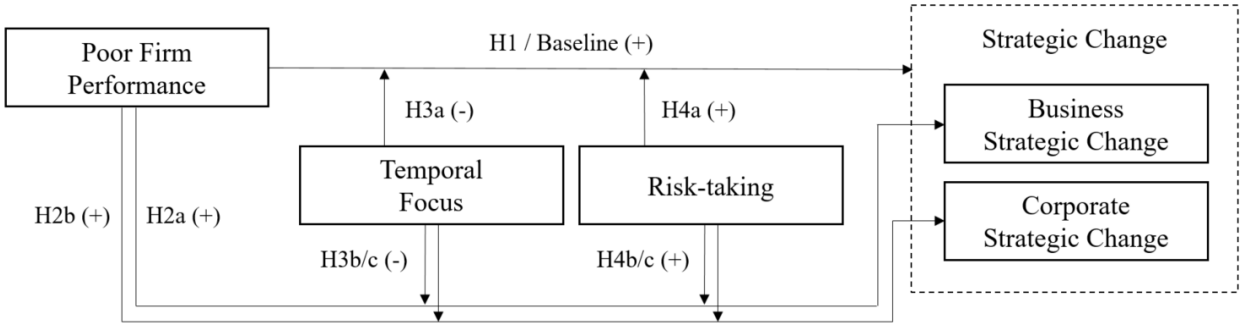


TABLE 1

Two Distinct Conceptualizations of Strategic Change

	Business Strategic Change (BSC)	**Corporate Strategic Change (CSC)**
Focus	Business strategy (how to compete in a domain)	Corporate strategy (where to compete)
Concept	Change related to business strategy (i.e., in the pattern of decisions related to the competitive behavior)	Changes related to corporate strategy (i.e., related to the corporate portfolio of businesses)
Key features:		
• Risk	Dealing with business-specific, unsystematic risks	Dealing with market-specific, systematic risks
• Temporal	Shorter- and mid-term resource allocation decisions: a few years, e.g., in line with the yearly budgeting	Mid- and longer-term resource allocation decision: several years, e.g., M&A activities
Measures	Strategic conformity and strategic persistence, strategic variation and deviation, resource allocation	Entropy measure of diversification
Exemplary studies	Carpenter, 2000; Finkelstein & Hambrick, 1990; Zhang & Rajagopalan, 2010; Zhu, Hu, & Shen, 2020	Kowalzick & Appels, 2022; Westphal & Bednar, 2005; Wiersema & Bantel, 1992

TABLE 2

Summary Statistics

	Mean	SD	Min	Max	N	1	2	3	4	5
1. Risk-taking	0.44	0.19	0	1	106	1				
2. Temporal focus	0.72	0.23	0	1	106	-0.57	1			
3. Journal rank	0.55	0.31	0	1	110	-0.32	0.37	1		
4. Firm size	0.41	0.32	0	1	110	0.27	-0.32	-0.27	1	
5. Performance type	0.8	0.4	0	1	110	0.12	-0.21	-0.19	0.16	1
6. Performance mean	0.56	0.5	0	1	110	-0.28	0.26	0.88	-0.22	-0.12

Notes. Pearson's correlation matrix; Mean = mean effect size; SD = standard deviation; Min = Minimal value; Max = maximum value; N = number of studies. Correlations with an absolute value greater than 0.2 are considered significant.

TABLE 3

Baseline Hypothesis (H1)

	N	k	$\bar{r}$	SD	95% CI	I^2
H1:	82	29,303	0.040	0.014	[0.012 : 0.068]	0.75

Notes. N = number of studies; k = total sample size over the individual studies; $\bar{r}$ = mean effect size, SD = standard deviation of $\bar{r}$; CI = confidence intervals, calculated using $\bar{r}$ and the standard error of $\bar{r}$. Results are significant when the confidence interval does not include the value zero.

TABLE 4

Subgroup Analysis (H2a/b)

	Measure	N_E	k_E	$\bar{r}$	SD	95% CI	I^2	$p_{subgroup}$
H2:	BSC	59	20,899	0.041	0.017	[0.009 : 0.073]	0.77	0.084
	CSC	28	9,420	0.008	0.027	[-0.044 : 0.061]	0.59	

Notes. N_E = number of effect sizes. The total number of effect sizes differs from the total number of studies (N = 82) because some studies included both types of strategic change. These types were analyzed separately. k_E = total sample size over the individual effect sizes; $\bar{r}$ = mean effect size, SD = standard deviation of $\bar{r}$; CI = confidence intervals, calculated using $\bar{r}$ and the standard error of $\bar{r}$. Results are significant when the confidence interval does not include the value zero.

TABLE 5

Meta-analytic Regression Analysis (MARA) on Strategic Change (H1, H2, H3a-c, H4a-c)

Dependent variable	SC_FULL Model 1	BSC Model 2a	CSC Model 2b	SC_FULL Model 3a	BSC Model 3b	CSC Model 3c	SC_FULL Model 4a	BSC Model 4b	CSC Model 4c
Intercept	0.06 (0.03) [0.033]	0.07 (0.03) [0.016]	-0.11 (0.06) [0.076]	0.14 (0.05) [0.006]	0.15 (0.05) [0.006]	-0.02 (0.1) [0.853]	0.01 (0.03) [0.807]	-0.02 (0.04) [0.63]	-0.18 (0.1) [0.081]
Temporal focus				-0.12 (0.06) [0.045]	-0.13 (0.06) [0.034]	-0.14 (0.12) [0.25]			
Risk-taking							0.12 (0.06) [0.046]	0.19 (0.07) [0.009]	0.10 (0.12) [0.386]
Controls:									
Journal rank	-0.07 (0.03) [0.009]	-0.07 (0.03) [0.053]	-0.10 (0.05) [0.049]	-0.09 (0.03) [0.002]	-0.09 (0.03) [0.013]	-0.10 (0.05) [0.048]	-0.10 (0.03) [0.001]	-0.09 (0.03) [0.009]	-0.11 0.05) [0.06]
Firm size	0.04 (0.04) [0.305]	0.01 (0.05) [0.756]	0.04 (0.07) [0.58]	0.03 (0.04) [0.515]	0.05 (0.05) [0.265]	0.01 (0.07) [0.881]	0.03 (0.04) [0.432]	0.05 (0.05) [0.286]	0.03 (0.07) [0.704]
Performance type	-0.05 (0.03) [0.174]	-0.05 (0.04) [0.256]	-0.02 (0.05) [0.714]	-0.03 (0.03) [0.303]	-0.04 (0.04) [0.3]	-0.01 (0.06) [0.897]	-0.03 (0.03) [0.315]	-0.04 (0.04) [0.343]	-0.01 (0.06) [0.814]
Performance mean	0.00 (0.03) [0.956]	-0.06 (0.04) [0.129]	0.05 (0.05) [0.322]	0.01 (0.03) [0.656]	-0.03 (0.04) [0.391]	0.06 (0.05) [0.242]	0.00 (0.03) [0.931]	-0.05 (0.04) [0.206]	0.04 (0.06) [0.448]
Model Parameter:									
N_E:	104	70	34	100	66	34	100	66	34
k_E:	36,415	24,304	12,111	35,907	23,796	12,111	35,907	23,796	12,111
I:	73.82	65.45	63.36	72.20	69.37	59.34	72.38	67.94	61.23
R:	11.82	12.53	41.87	20.45	26.10	44.30	19.65	30.32	40.42
T:	0.009	0.008	0.006	0.008	0.008	0.006	0.008	0.007	0.006
Q:	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
TM:	0.045	0.121	0.029	0.009	0.018	0.034	0.009	0.007	0.043

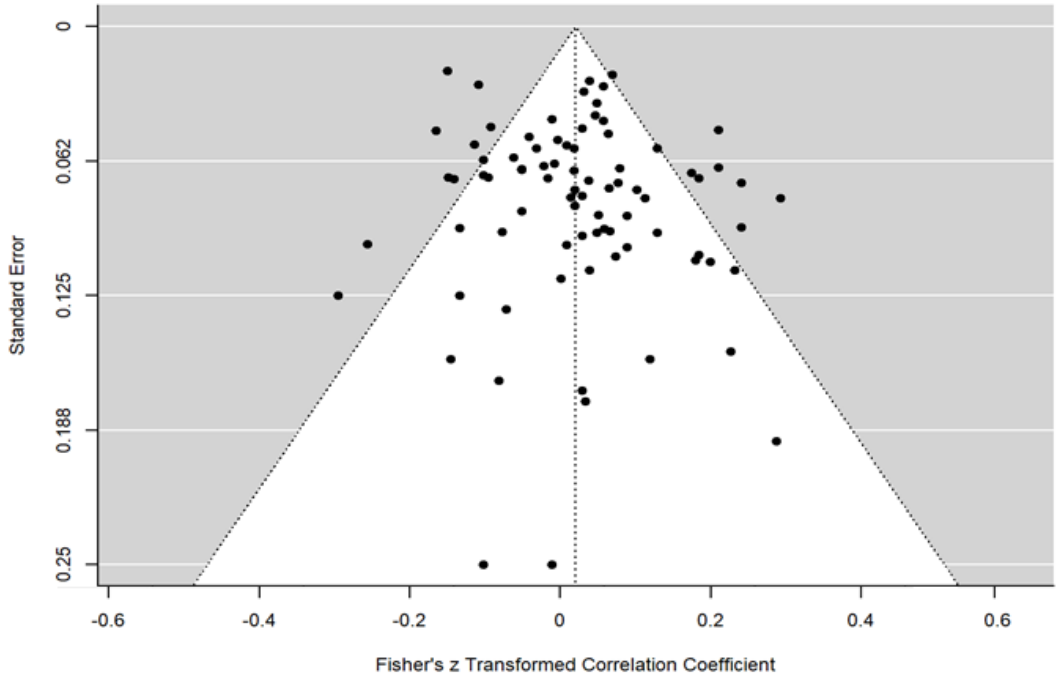
Notes. N_E = number of effect sizes. The total number of effect sizes differs from the total number of studies (N = 82) because some studies included both types of strategic change and different types of performance. The resulting combinations were included separately. k_E = total sample size over the individual effect sizes. I^2 = remaining between-study heterogeneity; R^2 = amount of heterogeneity accounted for; T^2 = estimated amount of residual heterogeneity; Q = Q-test, which is a test for residual heterogeneity; TM = Test of moderators.
Standard errors are in parentheses, and p-values are in brackets.

APPENDICES

APPENDIX 1

Funnel Plot

The following chart shows the funnel plot of our analysis. In the funnel plot, the *X*-axis represents the mean result (that may be an odds or risk ratio or a percent difference), and the *Y*-axis shows the sample size or an index of precision (Egger et al., 1997).



APPENDIX 2

Robustness Meta-analytic Regression Analysis on Strategic Change (H3a-c, H4a-c)

The following table shows the results of the MARA robustness test of the dichotomous (high/low) coded GLOBE variables.

Dependent Variable	SC_FULL Model 3a	BSC Model 3b	CSC Model 3c	SC_FULL Model 4a	BSC Model 4b	CSC Model 4c
Intercept	0.04 (0.02) [0.086]	0.04 (0.03) [0.141]	-0.14 (0.06) [0.024]	0.12 (0.04) [0.002]	0.15 (0.04) [0.001]	-0.08 (0.06) [0.217]
Temporal focus (high)	0.09 (0.03) [0.003]	0.10 (0.03) [0.003]	0.12 (0.06) [0.059]			
Risk-taking (high)				0.07 (0.03) [0.022]	0.10 (0.04) [0.006]	0.08 (0.06) [0.164]
Controls:						
Journal rank	-0.09 (0.03) [0.001]	-0.09 (0.03) [0.007]	0.23 (0.08) [0.009]	-0.09 (0.03) [0.001]	-0.08 (0.03) [0.015]	0.26 (0.10) [0.011]
Firm size	0.02 (0.04) [0.634]	0.05 (0.04) [0.261]	-0.01 (0.07) [0.911]	0.03 (0.04) [0.514]	0.04 (0.05) [0.37]	0.02 (0.07) [0.721]
Performance type	-0.04 (0.03) [0.268]	-0.05 (0.04) [0.23]	0.00 (0.05) [0.963]	-0.03 (0.03) [0.375]	-0.03 (0.04) [0.427]	-0.01 (0.05) [0.878]
Performance mean	0.02 (0.03) [0.568]	-0.03 (0.04) [0.411]	0.06 (0.05) [0.222]	0.00 (0.03) [0.949]	-0.05 (0.04) [0.187]	0.04 (0.05) [0.451]
Model parameter:						
N_E:	100	66	34	100	66	34
k_E:	35,907	23,796	12,111	35,907	23,796	12,111
I^2:	69.96	65.35	56.72	72.09	67.83	59.07
R^2:	28.56	38.13	50.22	20.81	30.80	45.49
T^2:	0.007	0.006	0.005	0.008	0.007	0.006
Q:	0.000	0.000	0.001	0.000	0.000	0.000
TM:	0.001	0.002	0.012	0.005	0.005	0.026

Notes. N_E = number of effect sizes. The total number of effect sizes differs from the total number of studies (N = 82) because some studies included both types of strategic change and different types of performance. The resulting combinations were included separately. In addition, this figure varies due to data availability. k_E = total sample size over the individual effect sizes. I^2 = remaining between-study heterogeneity; R^2 = amount of heterogeneity accounted for; T^2 = estimated amount of residual heterogeneity; Q = Q-test, which is a test for residual heterogeneity; TM = Test of moderators.
Standard errors are in parentheses, and p-values are in brackets.

APPENDIX 3

Robustness Meta-analytic Regression Analysis: Sample Independence

The following table shows the results of the MARA robustness test regarding sample independence by adding the following variables: Sample firm size, Sample period, and Country.

Dependent Variable	SC_FULL	BSC	CSC
	0.10	0.11	0.03
Intercept	(0.04)	(0.04)	(0.03)
	[0.007]	[0.008]	[0.314]
Control:			
	-0.07	-0.07	-0.03
Journal rank	(0.03)	(0.03)	(0.02)
	[0.011]	[0.042]	[0.258]
	0.02	-0.03	0.11
Performance Mean	(0.03)	(0.04)	(0.03)
	[0.544]	[0.469]	[0.003]
	0.03	0.04	-0.02
Size	(0.04)	(0.05)	(0.03)
	[0.479]	[0.334]	[0.631]
	-0.04	-0.05	-0.03
Performance Type	(0.03)	(0.04)	(0.04)
	[0.182]	[0.27]	[0.366]
	-0.07	-0.03	-0.17
Sample firm size	(0.02)	(0.03)	(0.03)
	[0.005]	[0.274]	[0]
	0.00	-0.01	0.08
Sample period	(0.02)	(0.03)	(0.03)
	[0.923]	[0.67]	[0.015]
	-0.03	-0.05	0.01
Country	(0.03)	(0.03)	(0.02)
	[0.251]	[0.095]	[0.611]
Model parameter:			
N_E:	104	70	34
k_E:	36,415	24,304	12,111
I^2:	71.01	69.71	0.12
R^2:	21.21	18.67	99.96
T^2:	0.008	0.008	0.000
Q:	0.000	0.000	0.316
TM:	0.006	0.079	0.000

Notes. N_E = number of effect sizes. k_E = total sample size over the individual effect sizes. I^2 = remaining between-study heterogeneity; R^2 = amount of heterogeneity accounted for; T^2 = estimated amount of residual heterogeneity; Q = Q-test, which is a test for residual heterogeneity; TM = Test of moderators. Standard errors are in parentheses, and p-values are in brackets.

APPENDIX 4

Sample Overview

The following table provides a list of the studies and data used. Next to publication information, we added information on the sample size of each paper, the period of primary sample examination, the region of origin, and the primary strategic change approach the paper pursues (BSC: Business Strategic Change; CSC: Corporate Strategic Change).

Study	Journal	Sample size (k)	Year	Sample region	Strategic change
Ahn, Cho, & Cho (2021)	MD	98	2011 - 2017	America	BSC
Alakent & Lee (2010)	JMS	574	1998 - 1999	Asia	BSC
Bednar, Boivie, & Prince (2013)	OS	232	2001 - 2005	America	BSC
Bigley & Wiersema (2002)	ASQ	61	1990 - 1994	America	CSC
Boeker (1997a)	AMJ	67	1978 - 1992	America	CSC
Boeker (1997b)	ASQ	67	1976 - 1993	America	BSC
Brockmann, Hoffman, & Dawley (2006)	JMI	47	1980 - 1995	America	CSC
Carpenter (2000)	JM	314	1991 - 1998	America	BSC
Chatterjee & Hambrick (2007)	ASQ	105	1992 - 2004	America	BSC / CSC
Chiu, Johnson, Hoskisson, & Pathak (2016)	LQ	234	1986 - 2009	America	CSC
Cho & Hambrick (2006)	OS	30	1973 - 1986	multiple	BSC
Choi, Liu, Yin, Qi, & Lee (2021)	JBR	2,350	2008 - 2015	Asia	BSC
Cummings, Eggers, & Wang (2022)	LRP	161	2000 - 2008	America	BSC / CSC
Datta, Rajagopalan, & Zhang (2003)	BJM	118	1977 - 1990	America	BSC
Dawley, Hoffman, & Lamont (2002)	JM	207	1980 - 1992	America	BSC / CSC
Decker & Mellewigt (2012)	BJM	91	1999 - 2004	Europe	CSC
Del Triana, Miller, & Trzebiatowski (2014)	OS	462	2002 - 2004	America	BSC
Diaz-Fernandez, Gonzalez-Rodriguez, & Simonetti (2016)	MD	147	2004 - 2009	Europe	BSC
Diaz-Fernandez, Gonzalez-Rodriguez, & Simonetti (2019)	EMR	177	2004 - 2009	Europe	BSC
Fang, Chrisman, & Holt (2021)	ETP	798	1996 - 2013	America	BSC
Finkelstein & Hambrick (1990)	ASQ	100	1978 - 1982	NA	BSC
Gibbs (1993)	SMJ	45	1982 - 1987	America	BSC / CSC
Goll & Rasheed (2011)	BP	5	1974 - 1986	America	BSC
Goodstein, Gautam, & Boeker (1994)	SMJ	334	1980 - 1985	America	BSC
Gordon, Stewart, Sweo, & Luker (2000)	JM	117	1987 - 1993	America	BSC
Greve & Mitsuhashi (2007)	OS	19	1975 - 1996	Asia	CSC
Haynes & Hillman (2010)	SMJ	236	1998 - 2002	America	BSC
Hoskisson, Johnson, & Moesel (1994)	AMJ	203	1985 - 1990	America	CSC
Huang & Zheng (2022)	FRP	387	2010 - 2018	Asia	BSC
Huh & Shah (2020)	AIMS	316	1998 - 2009	multiple	BSC

Study	Journal	Sample size (k)	Year	Sample region	Strategic change
Hutzschenreuter, Kleindienst, & Greger (2018)	MDE	177	1985 - 2007	Europe	CSC
Jiang, Wang, Chu, & Ma (2018)	JOCM	165	2000 - 2005	America	BSC
Jiang, Wang, Chu, & Zheng (2020)	GOM	132	2004 - 2014	America	BSC
Kalasin (2021)	RIBS	263	2013 - 2018	multiple	BSC
Karaevli & Zajac (2013)	JMS	193	1972 - 2010	America	BSC
Kipkirong Tarus & Aime (2014)	MRR	45	2002 - 2010	Africa	BSC
Kolev & McNamara (2020)	LRP	1,303	1996 - 2012	America	CSC
Kowalzick & Appels (2022)	JM	1,197	1996 - 2014	America	CSC
Kunisch (2017)	JBEM	116	1995 - 1998	multiple	CSC
Lant, Milliken, & Batra (1992)	SMJ	40	1980 - 1984	America	BSC
Le & Kroll (2017)	JIBS	387	2000 - 2007	America	BSC
Li & Chen (2019)	CMS	1,973	2004 - 2015	Asia	CSC
Li & Xu (2014)	NBRI	199	2007 - 2012	Asia	CSC
Liang, Barker, & Schepker (2018)	JCM	88	1997 - 2005	America	BSC
Lin & Liu (2012b)	IBR	160	2000 - 2005	Asia	BSC / CSC
Lin & Liu (2012a)	JMO	187	2000 - 2005	Asia	BSC
Lin & van Dang (2017)	JMO	439	2010 - 2011	Asia	BSC
Liu, Valenti, & Yu (2012)	CJAS	160	2000 - 2005	Asia	CSC
Liu & Atinc (2021)	MD	366	2001 - 2016	Asia	BSC
Liu & Wang (2021)	IJBM	1,017	2008 - 2018	Asia	BSC
Ma & Karri (2009)	JBM	929	2000 - 2001	America	BSC
McDonald & Westphal (2003)	ASQ	241	1999	America	CSC
Mitsuhashi & Greve (2004)	SO	19	1983 - 1999	Asia	CSC
Nakauchi & Wiersema (2015)	SMJ	214	1999 - 2001	Asia	BSC
Ndofor, Vanevenhoven, & Barker (2013)	SMJ	114	1990 - 1996	America	BSC
Oehmichen, Schrapp, & Wolff (2017)	SMJ	589	2005 - 2010	multiple	BSC
Pathak, Hoskisson, & Johnson (2014)	SMJ	227	1986 - 2009	America	CSC
Quigley & Hambrick (2012)	SMJ	181	1994 - 2006	America	BSC
Richard, Wu, Markoczy, & Chung (2019)	SMJ	1,393	1998 - 2015	Asia	BSC
Sakano & Lewin (1999)	OS	162	1988 - 1993	Asia	CSC
Shin (2019)	SF	338	1984 - 2007	America	BSC / CSC
Sidhu, Feng, Volberda, & Van den Bosch (2021)	OS	275	2003 - 2009	America	BSC
Tang & Crossan (2017)	LRP	101	1994 - 2001	America	BSC
Vieregger, Larson, & Anderson (2017)	JM	544	1998 - 2013	America	BSC
Wang & Jiang (2017)	MD	315	1996 - 2014	America	BSC
Wang & Luo (2019)	ASQ	1,557	2001 - 2011	Asia	CSC
Wang, Pellegrini, Xue, & Wang (2020)	JFBM	1,562	2008 - 2014	Asia	BSC
Wang, Jiang, & Ma (2021)	JET-M	81	1996 - 2014	America	BSC
Weng & Lin (2014)	JM	139	1994 - 2007	America	BSC
Westphal & Bednar (2005)	ASQ	228	NA	America	CSC
Wiersema & Bantel (1992)	AMJ	87	1980 - 1983	America	CSC
Wowak, Mannor, Arrfelt, & Mcnamara (2016)	SMJ	113	1993 - 2011	America	BSC

Study	Journal	Sample size (k)	Year	Sample region	Strategic change
Yokota & Mitsuhashi (2008)	APJM	36	1980 - 2004	Asia	CSC
Zhang & Rajagopalan (2003)	AMJ	220	1993 - 1998	America	BSC
Zhang (2006)	SMJ	207	1993 - 1998	America	BSC
Zhang & Rajagopalan (2010)	SMJ	193	1993 - 1998	America	BSC
Zhang, Ayoko, & Liang (2021)	JBR	337	2005 - 2016	Asia	BSC
Zhao, Carney, Zhang, Zhu (2020)	APJM	448	2003 - 2013	Asia	BSC
Zhao, Calantone, & Voorhees (2018)	JAMS	215	1996 - 2015	America	BSC
Zhou, Zhu, Yang, & Zou (2021)	Sus	3,409	2006 - 2017	Asia	BSC
Zhu, Hu, & Shen (2020)	SMJ	429	2001 - 2012	America	BSC
Zúñiga-Vicente & Vicente-Lorente (2006)	JMS	134	1983 - 1997	Europe	BSC

List of Abbreviations: AIMS = AIMS International Journal of Management, AMJ = Academy of Management Journal, APJM = Asia Pacific Journal of Management, ASQ = Administrative Science Quarterly, BJM = British Journal of Management, BP = Business and Politics, CJAS = Canadian Journal of Administrative Sciences, CMS = Chinese Management Studies, EMR = European Management Review, ETP = Entrepreneurship Theory and Practice, FRP = Frontiers in Psychology, GOM = Group and Organization Management, IBR = International Business Review, IJBM = International Journal of Business and Management, JAMS = Journal of the Academy of Marketing Science, JBEM = Journal of Business Economics and Management, JBM = Journal of Business and Management, JBR = Journal of Business Research, JCM = Journal of Change Management, JET-M = JOURNAL OF ENGINEERING AND TECHNOLOGY MANAGEMENT, JFBM = Journal of Family Business Management, JIBS = Journal of International Business Studies, JM = Journal of Management, JMI = Journal of Managerial Issues, JMO = Journal of Management and Organization, JMS = Journal of Management Studies, JOCM = Journal of Organizational Change Management, LQ = Leadership Quarterly, LRP = Long Range Planning, MD = Management Decision, MDE = Managerial and Decision Economics, MRR = Management Research Review, NBRI = Nankai Business Review International, OS = Organization Science, OS = Organization Studies, RIBS = Review of International Business and Strategy, SF = Social Forces, SMJ = Strategic Management Journal, SO = Strategic Organization, Sus = Sustainability.
Strategic change: BSC = Business Strategic Change, CSC = Corporate Strategic Change.

STUDY 2:

CORPORATE VENTURE CAPITAL AS DRIVER OF STRATEGIC CHANGE? AN INTERORGANIZATIONAL LEARNING PERSPECTIVE

Christian Schmidt*
(corresponding author**)**
Christian.Schmidt-2@wirtschaft.uni-giessen.de

Christian Kaiser*
Christian.Kaiser@wirtschaft.uni-giessen.de

Andreas Bausch*
Andreas.Bausch@wirtschaft.uni-giessen.de

*Department of Strategic and International Management, Justus-Liebig-University
Licher Strasse 62, 35394 Gießen, Germany
Phone: +49 641 99 22430

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ABSTRACT

Incumbent firms use corporate venture capital (CVC) as an interorganizational learning mechanism to get access to new technologies or to study and enter foreign markets. When companies adapt their product portfolios or expand their business activities geographically, strategic change takes place. Nonetheless, research still lacks an understanding of CVC's impact on both dimensions of strategic change. Building on learning theory, we examine the impact of CVC activity on product portfolio change and geographic change using a sample of 1,458 CVC units and 6,751 transactions. Our study provides empirical evidence that CVC investments act as a catalyst for strategic change: technology-related CVC investments lead to subsequent product portfolio adjustments, while investments in foreign start-ups drive geographic change. However, these positive change effects diminish with increasing industry and cultural distance, as higher investment uncertainty and risk arise from identifying (excessively) heterogeneous knowledge. This reduces the effectiveness of interorganizational learning and impedes strategic change.

Keywords: Strategic change, corporate venture capital, product portfolio diversification, internationalization, interorganizational learning, interfirm collaboration

INTRODUCTION

Firms strive for strategic change, an important instrument to achieve competitive advantage, survival, and superior performance (Barker & Duhaime, 1997; Carpenter, 2000; Wu, Wang, Yang, & Ying, 2021). Previous research framed organizational learning as one of various factors that either foster or impede strategic change of firms (Holmqvist, 2003; Klammer, Gueldenberg, Kraus, & O'Dwyer, 2017; Mohammad, 2019). In turn, interfirm relationships (such as alliances or joint ventures) represent "a catalyst for learning" (Inkpen, 2000, p. 1019), as they provide the opportunity to observe the partner firm's processes and to transfer relevant knowledge (Huber, 1991; Kogut, 1988).

However, little is known about how one specific form of interfirm collaboration, corporate venture capital (CVC), and its associated learning effects influence a company's ability to change itself. This is even more surprising given that equity-based partnerships are more effective at interorganizational learning and related knowledge sharing than non-equity-based interfirm linkages (Milagres & Burcharth, 2019; Schildt, Maula, & Keil, 2005). Thus, CVC is referred to as an "external knowledge acquisition strategy" (Belderbos, Jacob, & Lokshin, 2018, p. 20). Correspondingly, we investigate whether CVC-induced learning outcomes affect the parent firm's product portfolio and geographic change.

In recent years, CVC has gained considerable economic importance and has established itself as one of the most essential sources of entrepreneurial finance. CVC represents a type of venture capital in which established companies fund start-ups in exchange for minority equity stakes (Drover et al., 2017). CVC units are formed because parent firms pursue strategic rather than financial goals. Companies use CVC to study novel technologies and markets or to strengthen and leverage existing capabilities (Haslanger, Lehmann, & Seitz, 2022; Narayanan, Yang, & Zahra, 2009; Pinkow & Iversen, 2020). Although CVC investments are only minor in scale compared to other forms of interorganizational collaboration, they are particularly

important in overall strategy formulation (Maula, Keil, & Zahra, 2013). In strategic management, CVC plays an essential role as it offers a wide range of potential benefits to parent firms, e.g., as listening posts for product and market developments or for identifying acquisition targets (Chesbrough, 2002; Huang & Madhavan, 2021). Asel et al. (2015) note that firms rely on various strategic instruments to enhance their existing or acquire new knowledge: they build, buy, partner, and invest. Since value-added services are provided to new ventures, and (financial) resources are invested in them, CVC can be assigned to both the partnership and the investment approach. As CVC managers have insights into the processes and development of both the start-up and the investing company, they act as knowledge brokers and represent essential sources of information for the established firm's strategic decision-making.

The CVC-induced knowledge acquisition can lead to a transformation of an incumbent firm’s corporate strategy – better known as strategic change. Strategic change differs in terms of its form, quality, and duration, resulting from the company's adaption to its external environment (Rajagopalan & Spreitzer, 1997). In principle, strategic change is pursued to optimize the alignment with the business environment to ensure the best fit (Bourgeois, 1980). Ginsberg (1988) conceptualizes strategic change by differentiating between corporate-level strategies, which focus on product and market domains, and business-level strategies, which address competitive decisions in specific business sectors. This conceptualization emphasizes the wide range of change-related corporate activities, such as the degree of product and geographic diversification, the investment intensity in research and development, or the reallocation of key resources (Finkelstein & Hambrick, 1990; Hoskisson & Hitt, 1988; Sanders & Carpenter, 1998; Wiersema & Bantel, 1992).

Despite the growing popularity of CVC investments, there has been little research to date addressing the relationship between CVC, as part of a firm's corporate venturing activities, and strategic change (Basu & Wadhwa, 2013; Narayanan, Yang, & Zahra, 2009; Sharma &

Chrisman, 1999). In particular, research lacks an understanding of CVC's impact on the various dimensions of strategic change: only Basu and Wadhwa (2013) analyze the relationship between CVC investments and discontinuous strategic change. Since this represents just one facet of strategic change, we address the research gap by examining the impact of CVC investments on two significant dimensions of strategic change. As product market and geographic diversification are essential elements of a firm's strategic approach, our overarching research question is: *What is the impact of CVC activity on the parent firm's product portfolio and geographic change?*

We investigate the impact of CVC investments on both change dimensions, as incumbents use CVC to learn about technological developments or geographic markets (Belderbos et al., 2018; Dushnitsky, 2008). However, the success of interorganizational learning also depends on the distances between the parties involved (investing firm and venture) because aspects such as heterogeneity of knowledge, uncertainty, and mutual trust are closely related to distances (Baldi, Baglieri, & Corea, 2015; Lane & Lubatkin, 1998; Pak, Ra, & Park, 2009; Weber & Weber, 2007). Thus, as part of our research model, we examine the moderating effects of industry distance on the CVC activity-product portfolio change relationship, as increasing distance is associated with heterogeneous knowledge bases, higher uncertainty, and more complex technologies (Baldi et al., 2015; Wadhwa & Basu, 2013). Similarly, we analyze the impact of cultural distance on the incumbent's geographic change as CVC firms investing in more distant ventures realize that the cultural disparities and related risks are too substantial to overcome and refrain from expanding business activities abroad in subsequent periods. Our research model is summarized in Figure 1.

Insert Figure 1 here.

We focus on the effects of CVC transactions by constructing a measure of CVC activity that considers the amount of investments and the CVC unit's age. Using a sample of 1,458 CVC units, we examine 6,751 individual CVC transactions from 1999 to 2019. Our study provides empirical evidence that CVC investments indeed act as a catalyst for strategic change: technology-related CVC investments lead to subsequent product portfolio change, and CVC investments in foreign start-ups promote geographic change. However, these positive change effects become weaker when investing in more culturally or industry-distant ventures, as both investment uncertainty and risk increase due to the identification of (excessively) heterogeneous knowledge.

Furthermore, our study contributes to the growing literature on corporate entrepreneurship and strategic management in multiple ways. First, in recent years, CVC investments and research publications on CVC have increased considerably, underscoring its importance in incumbents' strategy formulation. Consequently, we are particularly interested in examining how CVC influences a critical aspect of a firm's strategic planning: changes in a firm's strategy. Thus, we are among the first researchers to analyze CVC's causal effects on the parent firm's strategic change. In particular, we examine the CVC effects on two specific dimensions of strategic change: *product portfolio change* and *geographic change*. We focus on these change dimensions as product market and geographic diversification are crucial elements of a company's strategy formulation (Westphal & Fredrickson, 2001). To comprehend the (learning) effects induced by CVC investments, we investigate the changes of these diversification measures over time.

Second, we construct a theoretical framework that applies interorganizational learning theory to connect CVC with strategic change. Although the literature on CVC, strategic change, and interfirm linkages deal with learning theory, the interplay of these phenomena has not yet been examined concerning interorganizational learning. Therefore, we present the first

interdisciplinary work linking the research fields of CVC and strategic change through the lens of learning theory. To gain a more pronounced understanding of the learning effects, we also investigate how industry and cultural distance affect learning success and subsequent change.

Third, in line with learning theory, we consider time-lagged effects by examining the strategic change level following a CVC transaction over four years. In the context of our research model, it is particularly interesting to explore time-lagged effects, as we assume that the CVC-induced learning process takes place over several periods. This means that the investing firms gain a better understanding of the newly acquired technologies, integrate them into their operations, and may decide to expand their business activities into another segment over time. Similarly, the incumbents' internationalization practices increase after the foreign venture's funding as the investing firms learn more about the target region's characteristics and institutions.

CONCEPTUAL BACKGROUND

Corporate Venture Capital

In addition to the more familiar forms of interorganizational collaboration, minority investments in promising start-ups, also known as CVC, have gained considerable importance within corporate entrepreneurship (Henley, 2007). CVC-backed financing increased fivefold to $170 billion between 2016 and 2021 (CB Insights, 2022), indicating that CVC has become an essential strategic means (Anokhin, Peck, & Wincent, 2016). By now, incumbent firms make more than 25% of all venture capital transactions (Haslanger, Lehmann, & Seitz, 2022). CVC is especially interesting for established firms because they typically require smaller investments than both acquisitions & internal R&D and can be terminated more easily (Folta, 1998). CVC investments are located between alliances and acquisitions: in return for both access to the funded venture's technologies and the opportunity to learn about a new region, CVC firms provide value-added services (consulting, networking, etc.) to the start-up in addition to the

equity investment (Dushnitsky, 2008; Maula, Autio, & Murray, 2005). Sometimes, incumbents invest a minority stake first and acquire the whole venture later, especially when uncertainty is high (Kim & Park, 2017).

Although some established firms launch CVC programs primarily seeking financial returns (like independent venture capitalists or private equity firms), most corporate parents pursue strategic objectives by applying learning mechanisms (Drover et al., 2017; Schildt et al., 2005). CVC investments can play an important role for parent firms in identifying and acquiring unknown technologies or monitoring market developments. Accordingly, both parties share knowledge by interacting and communicating frequently. For example, corporate investors are often given a seat on the board or specific rights that enable them to gather technological or market-related information (Lee, Kim, & Jang, 2015; Wadhwa, Phelps, & Kotha, 2009). Hence, CVC serves as an effective mechanism for interorganizational learning (Keil, Zahra, & Maula, 2018), which determines strategic change (Klammer et al., 2017).

Strategic Change

Due to dynamic (and often unpredictable) environments, it is inevitable for firms to pursue change to remain competitive (Ginsberg, 1988). However, in literature, the understanding of strategic change is quite broad. There are a variety of different terms that are used interchangeably, e.g., strategic transformation, strategic renewal, strategic variation, strategic deviation, corporate refocusing, organizational change, strategic experimentation, strategic adjustment, and strategic flexibility (Carpenter, 2000; Huff, Huff, & Thomas, 1992; Müller & Kunisch, 2018; Nicholls-Nixon, Cooper, & Woo, 2000; Pathak, Hoskisson, & Johnson, 2014; Snow & Hambrick, 1980). Correspondingly, Greiner and Bhambri (1989) provide a broad and well-established definition of strategic change: "a shifting interplay between deliberate and emergent processes that receive their relative emphasis under certain environmental and organizational conditions, leading radically or gradually to major changes

in strategy (e.g., mission, product/market mix), and/or organization (e.g., structure, systems, culture, people), and which result in a realignment between the firm and its environment" (p. 68). Therefore, strategic change is a significant corporate transformation process in which firms shift their business activities, product scope, resource deployments, goals, or strategic orientation (Klammer et al., 2017; Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997).

Since product market and geographic diversification represent key elements of a firm's strategy formulation (Westphal & Fredrickson, 2001), we examine the impact of CVC investments on two essential dimensions of strategic change: *product portfolio change* and *geographic change*. We focus on both change dimensions by drawing on interorganizational learning theory (Lane & Lubatkin, 1998) and linking them with specific measures (Table 1).

Insert Table 1 here.

Product portfolio change. A firm's core task is to continuously adjust its product portfolio, e.g., when the environment changes or a product nears the end of its life cycle. In line with this, Floyd and Lane (2000) define strategic change as a frequent process in which incumbents foster and process new knowledge to modify their product portfolio. Thus, we focus on an investing firm's product- and technology-related learning effects and label it as product portfolio change (Westphal & Fredrickson, 2001). In line with existing literature, we link this dimension with Palepu's (1985) entropy measure, which considers the annual change in the number of segments or industries in which parent firms operate. More specifically, this dimension of change refers to the adjustment of a firm's product diversification strategy from one year to another (Wiersema & Bantel, 1992).

Geographic change. The degree of a firm's international engagement indicates its dependence on foreign markets and in how many countries it operates (Sullivan, 1994). When firms decide to go international, this affects their resources, sales, or customer orientation.

Therefore, geographic change is an action that companies take to alter the scope of their international activities. In this vein, we conceptualize geographic change as the strategic (annual) shift of firms towards more substantial (or diminished) international commitment, encompassing foreign assets or the number of subsidiaries abroad (Westphal & Fredrickson, 2001). We link this approach with Sanders and Carpenter's (1998) geographic diversification measure.

THEORY AND HYPOTHESIS DEVELOPMENT

Interorganizational learning theory, as part of both the resource- (RBV) and knowledge-based view (KBV) (Barney, 1991; Grant, 1996), represents the primary theoretical approach in our study to explain how firms renew themselves using interfirm linkages (Das & Teng, 2000; Narayanan et al., 2009; Schmitt, Raisch, & Volberda, 2018). Although the literature on CVC and strategic change each draws on learning theory, little research has combined these phenomena by applying the interorganizational learning framework. Our theoretical model (Figure 2) suggests that CVC-induced interorganizational learning subsequently affects the parent firm's strategic change (Crossan, Lane, & White, 1999).

Insert Figure 2 here.

Corresponding to the basic ideas of the RBV & KBV, a firm is defined as a set of different resource bundles (such as product- or market-related knowledge). Companies possessing scarce, non-substitutable, difficult-to-imitate, and value-creating resources can achieve a competitive advantage by leveraging and combining these firm-specific, unique resources (Barney, 1991; Wernerfelt, 1984). However, when firms identify resource gaps in their processes, they must either develop resources internally or acquire external ones and combine them with existing resources to create new resource bundles and remain competitive (Ahuja, 2000; Das & Teng, 2000; Lai, Chiu, & Liaw, 2010). Thus, interfirm collaborations

provide external options to find relevant (knowledge) resources, integrate them into corporate processes, and create value (Basu, Phelps, & Kotha, 2011; Das & Teng, 2000).

The knowledge transfer process is divided into searching for and identifying relevant knowledge, its acquisition, subsequent assimilation, and finally, its integration (Milagres & Burcharth, 2019). Thus, when knowledge gaps become apparent, companies should seek out, discover, evaluate, and incorporate external knowledge using interorganizational learning to leverage the newly created knowledge base (Ahn, Cho, & Cho, 2021). In this context, firms interact and communicate with partner firms or analyze the partner's core processes and key resources. Next, companies assess and interpret the partner's identified knowledge resources to determine whether integrating them into their processes could be advantageous. In this case, the firms become active to eventually transfer and implement the potentially valuable knowledge into their own knowledge base (Levitt & March, 1988; Tamayo-Torres, Gutiérrez-Gutiérrez, Llorens-Montes, & Martínez-López, 2016). For example, when companies build interfirm relationships and monitor the partner firm's processes, they can identify novel knowledge about technologies, strategies, or markets (Bruneel, Yli-Renko, & Clarysse, 2010; Wadhwa & Basu, 2013). Moreover, the acquired knowledge can be internalized, accumulated, and stored for future use (Narayanan et al., 2009).

Additionally, the literature emphasizes that the effectiveness of interorganizational learning is affected by the various forms of distances between incumbents and ventures because aspects such as heterogeneity of knowledge, cultural disparities, or uncertainty depend on distances (Baldi et al., 2015; Pak et al., 2009; Wadhwa & Basu, 2013). Concerning product portfolio change, it is particularly interesting whether investments are made into ventures operating in the same, similar, or in an unfamiliar industry. This concept is called industry distance (Keil, Maula, Schildt, & Zahra, 2008b). For the geographic change dimension, it is relevant whether CVC units invest in culturally close or distant ventures (cultural distance). To

address these aspects, we examine the moderating effects of industry distance on product portfolio change and cultural distance on the geographic change level.

Product Portfolio Change

Firms make CVC investments to monitor emerging markets, pool (or exchange) technology-related knowledge, and refine their product range (Pinkow & Iversen, 2020; Yang, 2012). Through interactions with the venture, the investing firms identify and process attractive complementary knowledge and learn about novel technologies. Subsequently, based on the learning outcomes, the investing firms can either adjust an existing product or expand their activities into another segment by launching an entirely new product (Pinkow & Iversen, 2020; Wadhwa & Basu, 2013; Wiersema & Bantel, 1992). Leveraging these learning opportunities allows investing companies to build technology-related capabilities and minimize uncertainties (Lane & Lubatkin, 1998).

Regarding product portfolio-related change effects, incumbents use CVC investments as an interorganizational learning mechanism to identify new technologies (Haslanger et al., 2022), which are then integrated into the parent firm's processes, business models, and product development (Lee et al., 2015; Wadhwa et al., 2009; Wadhwa & Basu, 2013). By investing in promising ventures, CVC parent firms are able to discover novel, promising, and profitable markets and technologies for future operations and business activities (Yang, 2012). With higher CVC activity, parent firms consequently gain more insights into a larger number of potential product markets. If the parent firms increase their business activities in these previously unknown markets (by launching new products) in subsequent periods, this would be equivalent to product portfolio change.

Acquiring, understanding, and implementing new technological knowledge can result in product portfolio change of the investing firm. By analyzing unfamiliar technologies and customer markets, CVC units and internal R&D assess their potential to generate future value.

For instance, the identified technologies are utilized to enhance existing products, or the investing companies decide to enter the target's customer market themselves. Increased CVC activity, reflected in larger amounts invested or a higher number of portfolio ventures, is accompanied by a more intensive or diverse exchange of technological knowledge. As more opportunities exist to discover and integrate promising technologies, higher CVC activity should lead to changes in the existing product range. Furthermore, with a larger number of ventures, investing firms also have the opportunity to focus on promising technologies, interact more closely with the respective ventures, and thus promote product portfolio change. Hence, higher CVC activity is associated with discovering valuable and complementary technologies. By implementing new technologies, existing products can be modified or the product range expanded. In short, a higher level of CVC activity enhances the chances of an effective knowledge transfer, which is reflected in product portfolio change. Conversely, when CVC activity is low, firms either invest in a few ventures or only small amounts. Both scenarios offer less potential for interorganizational learning, resulting in less (or no) change.

Eventually, we expect the effects of CVC on the subsequent change level to become more potent in the post-investment periods as the technological knowledge acquired must first be identified and understood, which will take some time (Milagres & Burcharth, 2019). Afterward, the new knowledge is (gradually) integrated into the firm's activities and processes, leading to stronger product portfolio change in subsequent years. Therefore, we propose:

> **Hypothesis 1 (H1):** *CVC activity positively influences the parent firm's product portfolio change.*

Moderator: Industry Distance

Along our theoretical framework, we examine the moderating effects of *industry distance* on changes in the product portfolio following CVC investments. Industry distance refers to how close firms are in terms of their products and technologies, i.e., whether they

operate in similar or different product markets (Keil et al., 2008b). The industry distance between investing firms and the ventures will play a major role in the CVC-strategic change relationship, as investments in more distant start-ups involve technologies and customer markets about which the parent firm only has little prior knowledge.

CVC investments in ventures from distant industries should result in less product portfolio change due to more severe technological uncertainties (Baldi et al., 2015). After investing in and subsequently exchanging knowledge with ventures from unrelated industries, the CVC firms realize that they lack the required knowledge to successfully integrate the most promising technologies into their own processes or at least to identify them (Hill & Birkinshaw, 2014). The parent firm's limited familiarity with the distant venture's customer markets and technologies, which lie beyond the incumbent's previous knowledge base and boundaries (Wadhwa & Basu, 2013), makes it challenging to accurately assess the potential benefits of integrating the acquired knowledge. In particular, investing companies face two key uncertainties: first, whether they possess the capabilities to understand, integrate, and develop unfamiliar technologies, and second, whether the venture's technologies can deliver value in the future (Wadhwa & Basu, 2013). Thus, the greater the industry distance between the two partners, the more difficult it becomes to establish a successful learning relationship and to integrate knowledge into the investing firm's knowledge base (Inkpen, 2000; Yang, 2012). Accordingly, when investing in industry-distant ventures, there are fewer adjustments to the product portfolio and fewer entries into new product markets, leading to less change.

Conversely, the impact on product portfolio change is expected to be more pronounced for investments in ventures from similar, complementary industries (low distance) due to lower technological uncertainties and risks. Thus, investments in close ventures lead to change, as the parent firms and their R&D department can more effectively evaluate, learn, and quickly comprehend the acquired knowledge due to similar knowledge bases (Dushnitsky & Shaver,

2009; Hill & Birkinshaw, 2014), which simplifies the learning process. Promising technologies are then further developed, which may lead to the introduction of new products, e.g., in neighboring customer markets, reflecting a change in the product portfolio. Consistent with our argument, existing research suggests that interorganizational learning success is maximized among technologically similar firms (Katila & Ahuja, 2002; Lane & Lubatkin, 1998). This learning efficiency stems from two factors: first, the incumbent's existing knowledge aids in identifying, interpreting, and integrating new technologies (Cohen & Levinthal, 1990; Schildt et al., 2005). Second, the similar knowledge bases of both parties result in fewer conflicts and better alignment. By combining the parent firm's existing knowledge base with insights from complementary industries (Pinkow & Iversen, 2020), new knowledge can be created, leading to the development and launch of innovative products. Consequently, firms are likely to experience more efficient learning when investing in technologically similar ventures and are more inclined to expand into adjacent segments (Lennerts, Schulze, & Tomczak, 2020; Schildt et al., 2005), implicating product portfolio change. Overall, we propose:

> **Hypothesis 2 (H2):** *Industry distance between the parent firm and start-up negatively moderates the CVC activity-product portfolio change relationship.*

Geographic Change

CVC investments can be used to discover, learn about, and evaluate foreign markets (Anokhin et al., 2016; Wadhwa & Basu, 2013; Zahra & Hayton, 2008). Once an attractive region has been identified, CVC units scan the market for suitable start-ups in which to invest. After the investment, CVC units regularly interact with the start-up to gain a more comprehensive picture of relevant institutions or regional characteristics (Dushnitsky, 2008). Thus, establishing CVC units is a strategic means of market exploration to study foreign institutions and habits, find lucrative regions and international business opportunities, and access location-specific knowledge (Belderbos et al., 2018; Winters & Murfin, 1988). Ideally,

and depending on the learning results, CVC investments contribute to a parent firm's strategic decision to pursue further activities in the target country or to refrain from doing so.

Consequently, higher CVC activity is positively associated with increasing geographic change practices in later periods as companies seek to obtain a coherent picture of the target country and subsequently expand their activities. Research has shown that the primary obstacle to not engaging in international expansion is a lack of understanding of foreign markets (Bruneel et al., 2010; Lamb & Liesch, 2002). On these grounds, we expect that the more internationally active CVC units are, the more seriously willing the parent firms are to intensify their business activities abroad in subsequent years. Hence, they exchange information with the funded start-up to screen, observe, and test the market conditions. Moreover, CVC, as a comparatively resource-efficient approach, can be used to identify suppliers and partner firms to establish initial business relationships in the target region (Hill & Birkinshaw, 2008; Magni, Chierici, Fait, & Lefebvre, 2022). Similarly, CVC is often used to find and assess promising foreign acquisition targets (Zahra & Hayton, 2008): parent firms first invest a minority stake to evaluate a venture's potential better, and when they improve their understanding, they acquire the funded start-up. Thus, the more money is spent on foreign targets, and the larger the international portfolio, the stronger the subsequent geographic change effect should be.

The CVC-related learning process should increase internationalization practices that span multiple periods of the post-investment phase, as uncertainty and perceived risk related to the target country are relatively high at the time of investment (Titus, House, & Covin, 2017). After the initial transaction, CVC units accumulate foreign market-related information and incorporate it into their knowledge base by interacting with the local venture (Bruneel et al., 2010; Narayanan et al., 2009). By learning best practices and adapting to the region's characteristics (Zahra & Hayton, 2008), companies assess the potential to succeed in the country, learn how to set up international activities, and may decide to become more involved

in the foreign target market (Du, Zheng, & Chang, 2020; Wadhwa & Basu, 2013). Likewise, when CVC is used to test start-up candidates for subsequent M&A activity (Lee & Kang, 2015), it also takes several periods to close major internationalization deals. Therefore, we propose:

> **Hypothesis 3 (H3):** *CVC activity positively influences the parent firm's geographic change.*

Moderator: Cultural Distance

Due to considerations similar to those in the industry distance hypothesis (2), we address *cultural distance* as a moderator variable and examine whether it influences the relationship between CVC activity and geographic change. Cultural distance refers to the divergence in norms, attitudes, institutions, work habits, or values between one country and another (Kogut & Singh, 1988; Slangen, 2006). Companies require instruments to identify and better understand cultural disparities before intensifying international operations. As marketing or labor relation practices, for example, heavily depend on culture, the prior acquisition of local competencies is essential if firms subsequently plan to expand geographically (Datta & Puia, 1995). Thus, investing firms strive to assess whether the cultural challenges for future international business activities can be overcome. In this vein, firms often select low-commitment entry modes when exploring culturally distant countries to mitigate investment uncertainty and risk (Brouthers & Brouthers, 2001; Hutzschenreuter, Kleindienst, & Lange, 2016; Moalla & Mayrhofer, 2020).

Indeed, investments in more distant ventures are both riskier and less certain in terms of their prospects of success, as increased cultural distance correlates with higher transaction and information acquisition costs, diminishing cooperation, and less efficient interorganizational learning (Hong, Snell, & Easterby-Smith, 2006; Pla-Barber, Sanchez-Peinado, & Madhok, 2010). Analogously, Roy et al. (2016) found that culture and language pose major obstacles to

a firm's internationalization process. Correspondingly, divergent cultures between investing firms and the target entities can impede efficient communication and mutual trust building (Pak et al., 2009; Pesch & Bouncken, 2017). Therefore, the process of acquiring knowledge about new markets is adversely affected when the cultural distance between both parties becomes too substantial (Beugelsdijk, Kostova, Kunst, Spadafora, & van Essen, 2018; Wu, Sinkovics, Cavusgil, & Roath, 2007). Due to these challenges in identifying and processing knowledge about the potential target market, incumbents will refrain from diversifying their activities abroad. With a larger distance, similar mechanisms are at play as with other forms of cross-border interfirm linkages (such as acquisitions or alliances), often leading to their failure (Barkema & Vermeulen, 1998; Oh & Yoo, 2022). Therefore, cultural distance will negatively affect the relationship between CVC activity and geographic change. We anticipate this effect to be even more pronounced in the immediate post-investment period as parent firms swiftly recognize significant cultural differences and considerable challenges in pursuing further business opportunities. Consequently, incumbents are likely to make a rapid strategic decision to halt further investments in distant regions, amplifying the negative moderation effect in the first periods.

In contrast, the negative moderating effects on geographic change should be less pronounced when investments are made in proximate ventures. When incumbents select ventures with low cultural distance, substantial parallels emerge, e.g., in language, prevailing institutions, work practices, or dominant habits. These commonalities facilitate communication, knowledge sharing, and, consequently, the interorganizational learning process. The convergence of these factors results in a profound comprehension of the target region, minimizing uncertainties concerning the subsequent expansion of international business activities. Thus, it is more likely to expand into culturally close countries, as incumbents

perceive similar regions as less risky. This implies that more internationalization practices (higher change levels) are adopted when the cultural distance is low.

Overall, although CVC companies acquire location-specific knowledge and seek to understand the target region's peculiarities, cultural disparities result in higher (investment) complexity, risk, and uncertainty (Kraus, Ambos, Eggers, & Cesinger, 2015; Tihanyi, Griffith, & Russell, 2005). Thus, the investing firms realize that the cultural differences are too substantial to successfully overcome in subsequent periods and refrain from further internationalization practices. Correspondingly, the geographic change level decreases with cultural distance. Therefore, we propose:

Hypothesis 4 (H4): *Cultural distance between the parent firm and start-up negatively moderates the CVC activity-geographic change relationship.*

METHOD

Sample

The sample comprises 6,751 individual transactions from 1,458 CVC units worldwide that occurred between 1999 and 2019. Using Capital IQ as the primary source, we retrieved data on CVC units by selecting "Corporate Investment Arm" and matched these units with their ultimate corporate parents (UCP). Our analysis is subject to several exclusions: First, we only focused on closed transactions. Second, we excluded data from parent firms listed under SIC code six, which corresponds to the finance and insurance sector, as we assume that these companies pursue financial rather than strategic objectives. Finally, we manually verified the plausibility of the unit names to ensure that they were CVC units of established firms.

Measurements

Independent variable: CVC activity

In this study, the CVC activity was employed as the independent variable (e.g., Basu & Wadhwa, 2013). CVC activity equals the logarithmized accumulated value of individual

transactions of CVC units divided by the parent firm size and age of the CVC unit on a yearly basis and is measured as follows:

$$CVC\ activity = \frac{\frac{\sum H_{Tx}}{S_{Tx}}}{Year_{Tx-T0}}$$

H equals the logarithmized cumulative value of a CVC unit's current and past transactions on an annual basis. To account for the influence of the company size, we divided the accumulated transactions by firm size S of the current year. Firm size was measured by the logarithm of the firm's total assets, adjusted for historical exchange rates. To consider the frequency of transactions, we divided the value by the years since the company was founded. Therefore, we set T_x as the year the transaction took place and T_0 as the founding year of the CVC unit.

Dependent variable: Strategic change

Product portofolio change. Furthermore, product portfolio change (SC_PROD_PORT) is based on product market diversification (Westphal & Fredrickson, 2001). To measure change, we examine the yearly alteration of a firm's product diversification. Product market diversification is operationalized using the entropy measure, which takes into account the number of business segments in which a firm operates and weights each segment according to its contribution to total sales. The index ranges from 0 to 1, with higher values indicating a greater concentration of operations in fewer segments (Palepu, 1985).

Geographic change. To quantify the annual variation of the extent to which a company is geographically diversified, we operationalized geographic change (SC_GEO) using Sullivan's (1994) geographic diversification composite measure. This measure includes three components: (1) the ratio of foreign sales to total sales and (2) foreign assets divided by total assets. According to Sullivan, the number of country subsidiaries of the respective parent firm (3) is calculated as a percentage based on the highest value in the sample. Due to a lack of

country data, we used the sum of geographic segments, in which a company reports assets in its annual report, as a proxy. Finally, we summed the three variables to form a composite measure.

Time is critical regarding corporate reaction (Kunisch, Bartunek, Mueller, & Huy, 2017). Therefore, to examine learning and change effects, we followed existing research and chose a reasonable period of one to four years to capture geographic and product portfolio changes (Karaevli & Zajac, 2013; Tang & Liu, 2016; Wiersema & Bantel, 1992). In the final step, we calculated the annual difference starting from t0:t1 to t3:t4 for both change dimensions to measure strategic change.

Moderators

Industry distance. This measure is employed to quantify the degree of industrial similarity between two companies. Building upon previous research (Wadhwa & Basu, 2013), we operationalized industry distance based on the degree of overlap between the SIC (Standard Industrial Classification) codes of the target and parent firm (INDUSTRY_DISTANCE). This ranges from zero (completely identical SIC codes) to one (completely different SIC codes). A complete match results in a SIC distance of zero. A match of the first three digits results in a value of 0.25, the first two digits in a value of 0.5, and the first digit in a value of 0.75. In the absence of a match, the value is one.

Cultural distance. Composite measures, which combine cultural dimensions into a single Euclidean distance index, have been widely used to measure cultural distance (Beugelsdijk et al., 2018). Thus, to measure the cultural distance (CULTURAL_DISTANCE) between the target and parent firm, we applied Kogut and Singh's cultural-distance index (KSI) based on Hofstede's cultural dimensions of the countries in which the companies are headquartered (Hofstede, 2022; Kogut & Singh, 1988). A high KSI value indicates a large cultural distance between the units being compared, while a low value suggests greater cultural proximity.

Control variables

We controlled for firm size, age, prior performance, total transaction height, firm activities, types of interfirm linkages, and firm, year, and industry-fixed effects (Appendix 3). To measure *firm size,* we used the total assets of the parent firm (UCP_SIZE) at t_0. The values have been adjusted to the historical exchange rate in US-dollar. We further applied the natural logarithm to reduce skewness and equalize the results. For robustness reasons, we also tested total revenue as a proxy for firm size. Both variables correlated with r = 0.975. Although we already included firm size in our measure of CVC activity, we added it as a general control variable. Still, a low variance inflation factor (VIF = 1.70) indicated no sign of multicollinearity. To control for learning effects caused by the *age* of the CVC unit, we subtracted the year the CVC unit was founded from the year the transaction was announced (CVC_TRANSACT_AGE). We further controlled for *prior performance* by calculating the return on assets (ROA) for the target and parent firm. ROA is measured as net income divided by average total assets (ROA_UCP, ROA_TARGET). We used data from the year before the announcement (t_{-1}, while t_0 is the year of the announcement). Furthermore, we controlled for the CVC transaction's magnitude by applying the natural logarithm (TRANSACT_VALUE).

In addition, CVC investments tend to have lower resource inputs than other interfirm linkages. Correspondingly, we controlled for parent firm-specific activities: *IPO (initial public offering), FPO (follow-on public offering), buyback, M&A activities, downsizing, spin-off,* and other *interfirm linkages,* like strategic alliances or joint ventures. Therefore, we coded binary variables for each activity as one if specific parent firm activities occur within a timeframe of two years before the CVC transaction (t_{-2}:t_0). We also controlled for a post-investment merger to address the investing firm's potential objective of identifying future M&A candidates. Consequently, a binary variable was created, coded as one if the parent firm purchased the target within the five-year study period. We followed previous research (Abernethy, Dekker, & Grafton, 2021; Wowak, Mannor, Arrfelt, & McNamara, 2016) and applied mean imputation for

each control variable to avoid losing sample size due to missing values (Hair, Black, Babin, & Anderson, 2019).

Procedure

To determine the impact of CVC activity on both dimensions of strategic change, we applied an OLS regression. To examine temporary effects, we calculated the regression over four years (t_0:t_1 to t_3:t_4), where t_0 equals the year the CVC transaction occurred. Due to the impact period of one to four years of strategic change, we only considered CVC units established before 2019.

In line with our definition, we either frame strategic change as a means of adjusting the existing product portfolio (e.g., by moving into new business segments) or expanding international operations. However, we are aware that CVC transactions can be used for both (Wadhwa & Basu, 2013). Therefore, we only included cross-border transactions to minimize scatter effects when calculating geographic change. For our analysis regarding product portfolio change, we focused on domestic transactions only and, thus, excluded cross-border transactions. Finally, we dealt with outliers by winsorizing at the 1st and 99th percentile levels (e.g., Oehmichen, Schrapp, & Wolff, 2017). We calculated the regression using the package statsmodels with Python 3.8.11 (Seabold & Perktold, 2010).

RESULTS

Descriptive Statistics

Table 2 gives an overview of our variables' descriptive statistics and inter-correlation.

Insert Table 2 here.

We only examined transactions with at least one available strategic change period (t_0:t_1 to t_3:t_4). Our dataset shows the following characteristics:

(a) Internationalization: 37.7% of the transactions occur in cross-border activities, while 62.3% are domestic.

(b) Industry distance: The analysis of the industry distance between buyer and target firms through SIC codes reveals the following investment distribution: 5.17% of firms invest within the same industry, 11.47% invest in firms with the first three digits of the SIC code identical, 5.98% invest in firms sharing the first two digits, and 6.66% invest in firms sharing the first digit. Notably, 70.72% of investments occur in firms from different industries.

(c) Cultural distance: Cultural distances in cross-border transactions range from very dissimilar cultures (Japan and Sweden, KSI: 6.67) to very similar cultures (USA and Australia, KSI: 0.02), while the sample median is 1.82.

(d) Firm size: Our sample shows that large companies are mainly involved in CVC activities. So, the assets of the parent firms at the time of the transaction ranged from 0.5 (e.g., PT Barito Pacific Tbk) to more than hundreds of billion USD (e.g., Alphabet, Microsoft, BP, or General Electric). In comparison, the sample median equals 43.8 billion USD.

(e) Amount of investment: Investments vary from tens of thousands (e.g., Illumina invested in Solarea Bio in 2017) to more than 300 million USD (e.g., Salesforce invested in Automattic in 2019), with a median sample size of 9.0 million USD.

Product Portfolio Change

The regression analysis yielded the following results: First, the impact of CVC activity on *product portfolio change* was investigated. H1 posits that higher activity of a CVC unit leads to more product portfolio change within its parent firm, consequently broadening the parent firm's business activities. Our findings indicate a significant positive influence of CVC activity throughout the observation period, supporting H1.

Moderator: Industry Distance

Furthermore, H2 posits that the interaction effect of *industry distance* negatively moderates the relationship between CVC activity and product portfolio change. Consequently, the greater the distance between the parent firm and the target, the less the parent firm adjusts its business activities. Our findings indicate a significant negative influence on the relationship throughout the observation period. Therefore, H2 is supported (Table 3; Appendix 1).

Insert Table 3 here.

Geographic Change

Second, the influence of CVC activity on *geographic change* was tested. H3 states that higher activity of a CVC unit leads to more geographic change of its parent firm. The results demonstrate that CVC activity exerts a significant positive influence, but only for later observation periods (t_2:t_3; t_3:t_4). Moreover, the final period is only marginally significant ($p < .1$), thereby providing only partial support for H3.

Moderator: Cultural Distance

Furthermore, H4 posits that the interaction effect of *cultural distance* exerts a negative moderating influence on the relationship between CVC activity and geographic change. Consequently, the more distant the venture, the less the parent firm engages in subsequent international business activities. Our findings indicate a significant negative influence on the relationship for the first three observed periods (t_0:t_1 to t_2:t_3). Therefore, H4 is only partially supported (Table 4; Appendix 2; Appendix 4 presents the basic models).

Insert Table 4 here.

Supplementary Analysis

Cross-period post-hoc analysis. In addition to considering individual time factors, we conducted a quadratic regression analysis using a structured and standard approach to determine whether the relationship between the variables in our study was linear or curvilinear. To test for curvilinearity, we incorporated polynomial features into the model (Ostertagová, 2012). Specifically, we created a second-degree polynomial term for the independent variable to capture potential quadratic relationships. This involved including linear and quadratic terms along with control variables in the regression model.

To ascertain the nature of the relationship, a significant positive quadratic term indicates the presence of a U-shaped relationship. In contrast, a significant negative term suggests the possibility of an inverted U-shaped relationship. Without a significant quadratic term, it is possible to infer that a linear model might be a more appropriate representation of the data (Haans, Pieters, & He, 2016).

The analysis revealed that for product portfolio change, $\beta = 0.009$, $p < .001$, indicating a significant positive U-shaped relationship. This means that the dependent variable initially decreases and then increases over time (Haans et al., 2016). However, for geographic change, the results of the quadratic regression were $\beta = .0012$, $p > .05$. Thus, with a p-value greater than 0.05, there is no significant quadratic curve. This indicates that a linear model may more accurately describe the data. Consequently, the linear regression model demonstrated a superior fit ($\beta = -.005$, $p < .001$), suggesting a significant negative linear relationship, indicating that the dependent variable decreases over time (Haans et al., 2016). Figures 3 and 4 present the plots of the cross-period analysis.

Insert Figures 3 and 4 here.

Robustness checks to deal with potential endogeneity. We applied several approaches to tackle potential endogeneity issues (Bascle, 2008). First, we time-lagged our dependent variable to avoid simultaneity and reversed causality between our variables. Second, we controlled for firm, industry- and year-fixed effects to reduce the chance of omitted variables. Third, we tested our results for robustness with a clustered covariance estimator (Antonakis, Bendahan, Jacquart, & Lalive, 2010). This approach led to comparable results. Lastly, we used the Wu-Hausman test to determine if it is necessary to use an instrumental variable method (Sheppard, Rene-Corail, Guangyi, & Lewis, 2020). We chose investment rounds because of their significant correlation with CVC activity in our unreported first-stage results. Investment rounds were measured as the number of transactions into a specific target and depicted the development stage of the target company. However, there was no significant correlation with our strategic change variables (Heckman, 1979). Consequently, using investment rounds as an instrumental variable, the Wu-Hausman test indicated no endogeneity ($p < .05$). Consequently, these approaches served to attenuate endogeneity concerns.

DISCUSSION

Our study examines the effects of CVC activity on two specific dimensions of strategic change: *product portfolio change* and *geographic change*. The study provides interesting insights. First, CVC investments drive product portfolio and geographic change. Second, these effects weaken with increasing industry and cultural distance. In fact, increasing distance leads to diminishing effects because investment uncertainty and risk rise due to the identification of excessively heterogeneous knowledge.

Interpretation of Results and Contribution

Product portfolio change. First, incumbent firms utilize CVC to acquire and incorporate complementary technological knowledge, enhancing their product portfolios or entering new customer markets, thereby driving product portfolio change. Hence, CVC serves as a means of "external R&D" (Kann, 2001, p. 12) to gain competitive advantage over rivals (Pinkow & Iversen, 2020). Accordingly, our results demonstrate across all post-investment periods that being more active in exploring new technologies and integrating related knowledge leads to stronger subsequent product portfolio change. The more pronounced change effects can be attributed to the availability of a higher number of learning and knowledge sources (ventures) when parent firms are more active in CVC investing. Alternatively, being more active in CVC investing involves purchasing larger stakes in one start-up, facilitating closer collaboration and a deeper understanding of novel technologies. As a result, internal R&D evaluates the acquired technological knowledge and learns about its functions and potential added value. Ultimately, the investing firms incorporate the knowledge into their processes and products, leading to product portfolio change. This confirms that CVC investments act as an efficient learning and related change mechanism.

Similarly, higher CVC activity will drive more significant product portfolio change, as the management of the CVC firm may have higher expectations of the investment outcomes. That is why justifying investments by expanding the product portfolio or strengthening the core business could become a key objective. Correspondingly, CVC managers will strive to deliver demonstrable learning successes, e.g., in the form of change. Consequently, increased CVC activity facilitates greater technological learning, which in turn leads to the creation of new products (Karim, 2009). Existing literature supports this view, indicating that learning and innovation capabilities positively impact change (Tamayo-Torres et al., 2016).

Regarding time-lagged and associated learning effects, product portfolio change becomes even more intense in subsequent years: after acquiring the complementary technological knowledge, the established firms assess the potential value and then "learn" how to integrate it into the existing knowledge bundles (Pinkow & Iversen, 2020). Since we find even stronger positive effects in later periods, investing firms require some time to fully comprehend the novel technologies. Afterward, internal R&D recommends implementing this knowledge and developing the product portfolio. Hence, our time-lagged effects indicate that parent firms build their product portfolio rather gradually (Basu & Wadhwa, 2013). In line with our definition, strategic change could occur through incremental or radical learning (Schildt et al., 2005). While the former involves the gradual adaptation of products and expansion into adjacent customer markets, the radical learning approach refers to entry into entirely new segments (Narayanan et al., 2009). Accordingly, for a more rapid and radical approach to strategic change, the parent firm would have to choose interfirm linkages with higher resource commitments, such as mergers and acquisitions (Bergh & Lawless, 1998).

However, as expected, our results show that investing in industry-distant ventures attenuates the positive change effect because the investing firms face higher levels of (communication) complexity and (transaction) costs as the cultural distance to the venture increases (Beugelsdijk et al., 2018; Wu et al., 2007). Thus, upon investing in more distant ventures, firms encounter significant uncertainty and risk due to heterogeneous knowledge bases. Consequently, they often decide not to integrate the identified technologies, leading to fewer changes in their product portfolio. Internal R&D, lacking familiarity with these technologies, would need to exert considerable effort to understand and incorporate the acquired technological knowledge into existing products or to use it as a basis for new product launches. In addition, in the case of distant investments, market characteristics, processes, and

customer needs differ substantially from those of the parent firm (Wadhwa & Basu, 2013), making learning even more challenging.

In contrast, the learning process for internal R&D is simplified if the investing firms select ventures from neighboring industries with complementary technologies. In such cases, R&D employees are likely to possess similar knowledge already, enabling them to quickly identify technological potential and integrate it into the parent firm's processes and products (Hill & Birkinshaw, 2014; March, 1991). This may lead to an expansion of product segments (into adjacent sectors), thereby driving strategic change. Our findings thus support existing research on more efficient collaboration and learning between firms in similar industries (Hill & Birkinshaw, 2014; Sykes, 1986). Ultimately, moving into similar markets is promising for investing firms, as they can better assess their chances of success and predict potential returns more accurately.

It should be emphasized, however, that investing in start-ups from distant industries can also add great value and enable interorganizational learning. Such investments offer CVC firms opportunities to explore real options, monitor technological developments, and strengthen their core segments (Anokhin et al., 2016; Baldi et al., 2015; Pinkow & Iversen, 2020). Accordingly, Tong and Li (2011) found that firms resort to CVC (relative to other interfirm linkages), especially when they face high technological uncertainty. CVC helps them stay abreast of innovative developments and diversify their technology-related knowledge sets (Lee & Kang, 2015), allowing them to respond faster to market threats while limiting the resources they need to invest (Keil, Autio, & George, 2008a). Our descriptive data indicate that this practice is quite common, with over two-thirds (70%) of all investments made in unfamiliar industries. This aligns with the literature, which highlights that one of the main objectives of CVC is to provide a window into new technologies (Haslanger et al., 2022). This motive enables parent firms to

implement strategies that protect and strengthen their core business - which subsequently results in less product portfolio change.

Geographic change. Second, CVC investments in foreign ventures are used to learn about and evaluate unknown markets to initiate internationalization steps with comparatively low resource commitment (Belderbos et al., 2018; Dushnitsky, 2008). Accordingly, subsequent geographic change is positively affected by CVC activity: the more active a CVC unit is in investing abroad, the higher the incumbent's change in international business activities in the post-investment phase. Therefore, we characterize CVC as a 'precursor' to the investing firm's later internationalization practices. In preparation for entering the foreign market, relationships are established with local partner firms in subsequent periods. By interacting with the selected ventures, incumbents get a comprehensive picture of the target region and its relevant institutions, values, and work habits (Zahra & Hayton, 2008). The positive change effect in the post-investment phase indicates that parent firms continuously interact with foreign ventures to analyze the region under investigation, develop internationalization capabilities, and expand their foreign market activities (Bruneel et al., 2010; Du et al., 2020). Thus, by gathering information through the venture, the investing firms better understand how to design further business activities in the target country (Magni et al., 2022). Correspondingly, our results support Zahra and Hayton (2008), who state that internationalization processes and venturing require some time. Our findings imply that this is also true for the interorganizational learning process induced by CVC.

However, CVC is not the only strategic means of entering the foreign market for established firms. Still, incumbents use several internationalization practices, such as increasing export activities, establishing joint ventures, or acquiring other promising foreign firms (Claver, Rienda, & Quer, 2007). In particular, prior studies show that acquisitions are strongly associated with CVC, as many incumbent firms use CVC to identify and study potential targets (Asel et

al., 2015; Benson & Ziedonis, 2009). Consistent with our results, the parent firms might acquire the (foreign) ventures in subsequent periods when the incumbents can better assess the start-ups' prospects. Consequently, as more efforts and resources are put into foreign markets, parent firms expand their international activities.

Nonetheless, the learning processes stimulated by CVC investments do not inevitably lead to increased internationalization in subsequent periods. We argue that learning can take place even when the cultural distance between CVC firms and ventures becomes substantial. However, investing firms realize that operating successfully in a culturally distant target country will require excessive efforts in the future to cope with the cultural disparities. Since the CVC firms accumulate and analyze knowledge about the target region after the investment has been made, they can gain a better understanding of environmental influences, institutions, or work practices in the foreign market (Belderbos et al., 2018; Magni et al., 2022). Therefore, for culturally distant countries, the investing firms find that the disparities identified pose substantial challenges, leading them to avoid further internationalization activities after the initial CVC investment. Indeed, our results reveal that the strategic change effect becomes weaker with increasing cultural distance. Thus, we show that despite the incumbent firm’s willingness to become more engaged in a distant market, the liability of foreignness is too great to expand foreign business activities in subsequent periods (Moalla & Mayrhofer, 2020; Zaheer, 1995). Distance-related phenomena, such as increased complexity and higher uncertainty and (transaction) costs, lead investing firms to refrain from further intensifying their international business activities (Beugelsdijk et al., 2018). These observations on the negative influence of cultural distance align with studies on interfirm linkages as a foreign market entry mode. For international joint ventures, up to 50% of all projects are discontinued within the first five years because of persistent location-specific uncertainties (Meschi & Riccio, 2008).

Likewise, interorganizational learning in alliances and acquisitions is negatively affected by cultural distance (Barkema & Vermeulen, 1998; Pesch & Bouncken, 2017).

Managerial Implications

Our findings offer valuable insights for practitioners. First, CVC serves as a useful strategic instrument when parent firms seek to adapt their product portfolio. In this vein, managers can utilize CVC to learn about novel technologies and customer markets, thereby enhancing and expanding the incumbent's existing product portfolio. By investing in start-ups, established firms acquire complementary knowledge to further develop current products or introduce new ones. However, managers willing to adjust their product portfolio should focus on ventures from similar yet complementary industries. In such cases, the knowledge inflow will be efficiently processed due to the more homogeneous knowledge bases of the involved parties, reducing uncertainty. While our results indicate that investments in ventures from unfamiliar industries lead to less change, they still hold value for parent firms. It is advisable for managers to select ventures with high industry distances to monitor technological trends and to be able to respond quickly to market threats, thereby protecting the core segment and gaining a competitive advantage (Pinkow & Iversen, 2020). In contrast, if managers want to expand their portfolios into distant industries, they should consider interfirm linkages with higher resource commitment, such as mergers and acquisitions (Bergh & Lawless, 1998).

Second, managers can choose CVC to study unknown foreign markets and take their first steps toward internationalization with a comparatively low-cost investment. Indeed, our results show that after initial CVC investments, foreign activities have intensified in subsequent periods. From this, we infer that incumbent firms have acquired market-specific knowledge by communicating with foreign ventures and thus intensify their international business activities. Moreover, CVC investments are made to test and assess potential foreign M&A targets: our findings suggest that parent firms initially choose a market entry mode with little resource

commitment and, after analyzing the start-up's prospects, may acquire the entire venture, increasing internationalization. Furthermore, the results indicate that learning does even take place when the cultural distance becomes too substantial, as investing firms then tend to refrain from further international expansion. Overall, CVC can help an investing firm understand regional peculiarities or build a foreign network to support its geographic expansion strategy efficiently. Otherwise, CVC serves as a cost-effective strategic instrument for recognizing that regional differences could significantly impede successful further internationalization. In such cases, CVC is valuable for parent firms as the CVC-related learning prevents them from bringing additional financial or human resources to the target region.

Nonetheless, as we have shown in our reasoning, CVC is closely connected to other forms of interfirm relationships and must, therefore, be coordinated with them to jeopardize the intended (change) objectives (Dushnitsky & Lavie, 2010).

Limitations and Future Research

Our study is not without limitations: First, although the literature emphasizes the strategic objectives of CVC investments, some incumbents could also pursue purely financial objectives (Siegel, Siegel, & MacMillan, 1988; Wang, Zhou, An, & Yang, 2019). Strategic change is closely linked to learning effects and, thus, the strategic dimension of CVC investments. However, we could not exclude parent firms that only seek financial gains through CVC investments. This lack of exclusion may have reduced the expressive power of our analysis. To mitigate potential biases, we excluded financial sector CVC units based on their SIC code, as banks or private equity firms are likely to have financial objectives. Therefore, future studies can refer to samples that include only CVC units with strategic goals; e.g., these could be identified through surveys.

Second, we applied a somewhat isolated view on CVC investments. However, CVC is part of an incumbent firm's strategic learning toolbox (e.g., alliances, joint ventures, exporting,

acquisitions, etc.) (Lee & Kang, 2015). Future studies could consider the variety of interfirm linkages, as there are interdependencies and synergies between the different strategic instruments (Belderbos et al., 2018; Zahra & Hayton, 2008). These would allow a more detailed understanding of the interactions between other interfirm relationships. For example, a comprehensive view is desirable because investing companies may allocate a certain annual investment sum to all interfirm collaboration activities. We also encourage researchers to examine the interactions between different forms of interfirm linkages and their cumulative effects on strategic change, as we categorize CVC as a precursor and screening mechanism for subsequent (foreign) M&A activity. Similarly, CVC investments and associated learning effects depend on the incumbent's other search activities, as redundant knowledge could be acquired through different channels (Belderbos et al., 2018; Haslanger et al., 2022). Thus, some firms may have less CVC activity only because knowledge is transferred through other interfirm relationships.

Third, we acknowledge other potential moderator variables worth exploring in the future. As we focused on individual CVC transactions, we cannot make any statements on a portfolio's diversity effects. Although we provide evidence on the distance between the incumbent and the start-up, it would also be interesting to measure the diversity of the parent firm's portfolio: an aggregate view of the portfolio's complexity would make it possible to examine what level of diversification is needed to promote change. As such, future studies could explore the effects of the portfolio's geographic and industry diversity (Belderbos et al., 2018; Matusik & Fitza, 2012).

Conclusion

The study contributes to the literature on CVC, its associated interorganizational learning effects, and, in particular, its impact on two specific dimensions of strategic change. Drawing on learning theory, we find strong evidence that CVC investments lead to changes in

the investing firms' product portfolio and internationalization practices in subsequent periods. Thus, our study classifies CVC as an effective catalyst for strategic change. However, the results for our moderators show that the more substantial the distance between the investing firm and the start-up, the more the change effects diminish due to increased uncertainty and heterogeneous knowledge bases. Finally, we consider time-lagged effects to analyze CVC-induced learning effects and the associated strategic change.

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FIGURES AND TABLES

FIGURE 1

Relationship between Corporate Venture Capital and Strategic Change

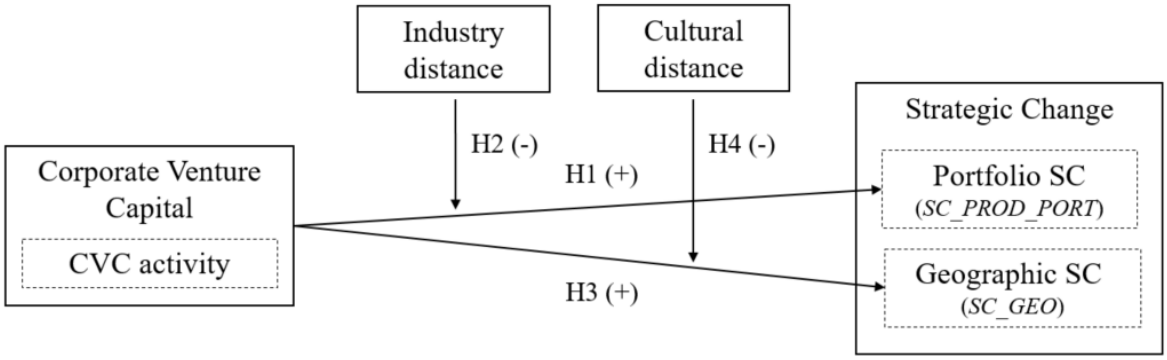


FIGURE 2

CVC-related Interorganizational Learning Framework

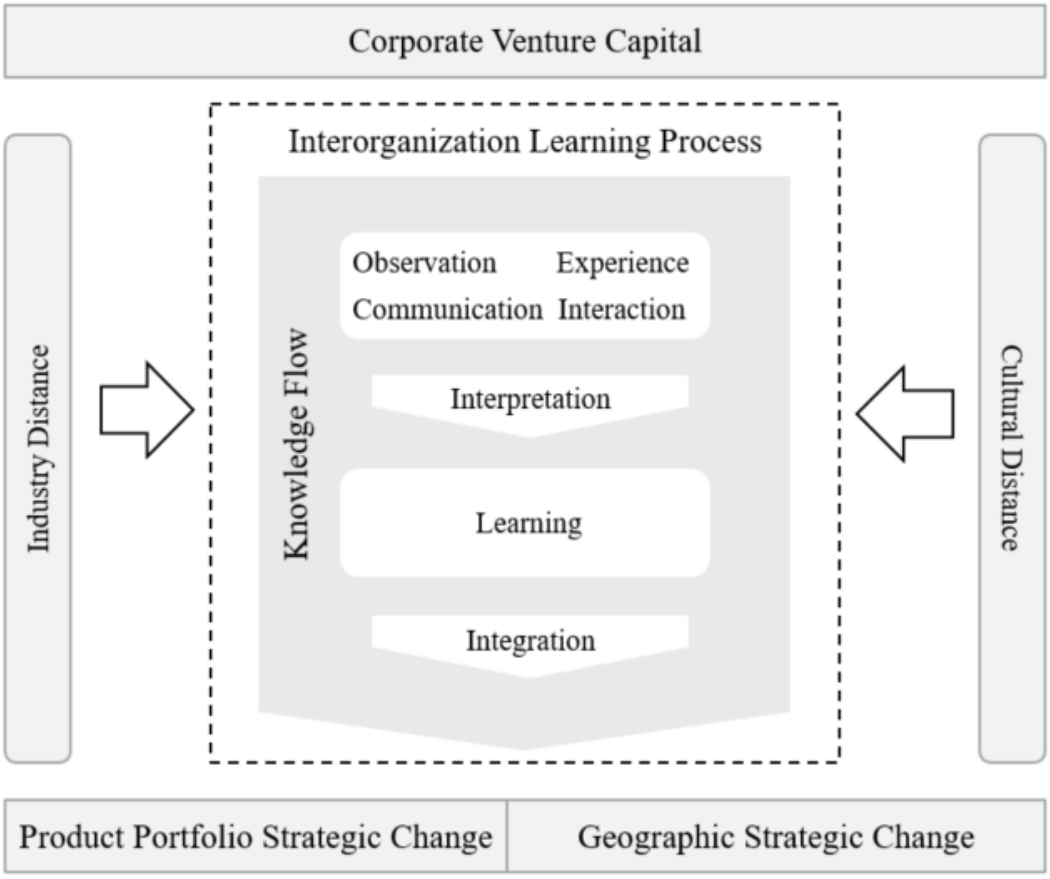
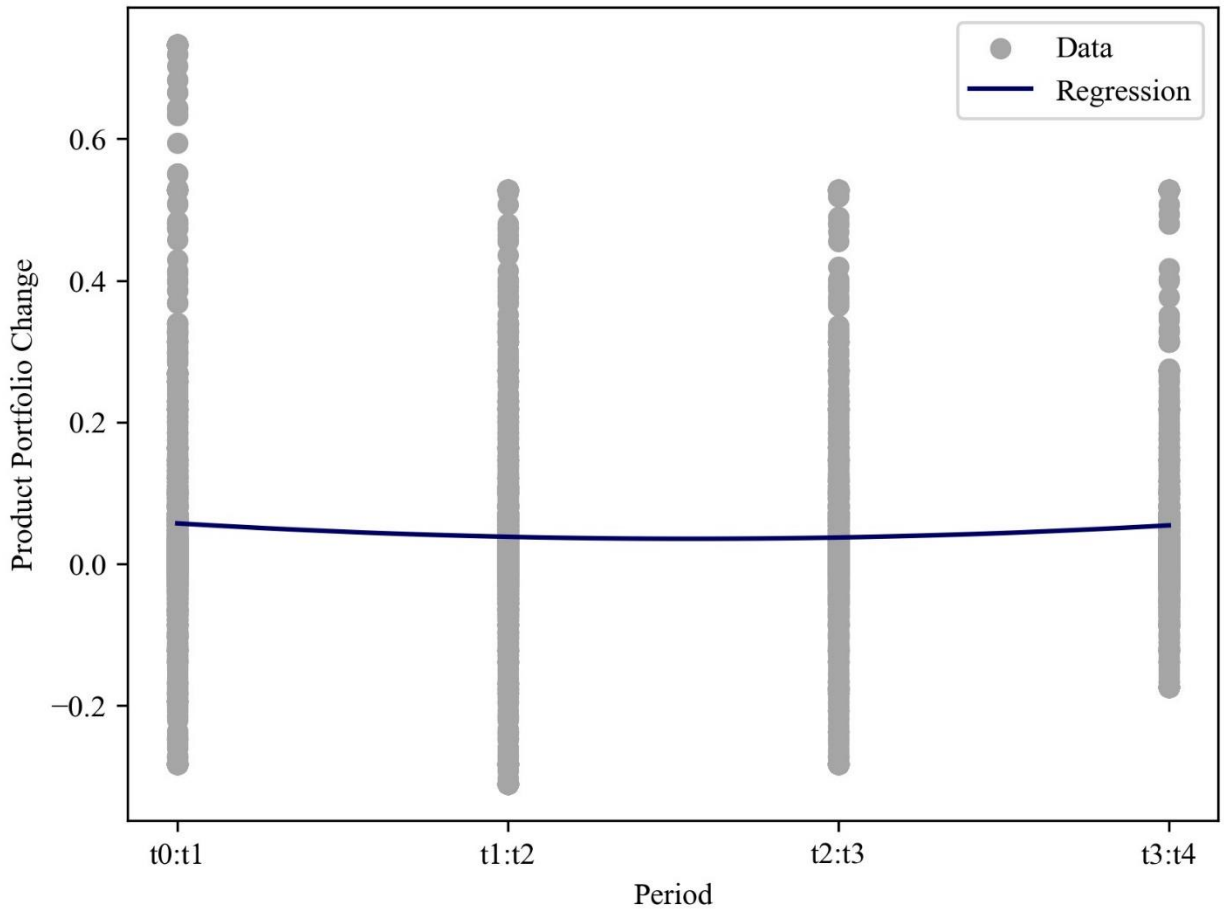


FIGURE 3

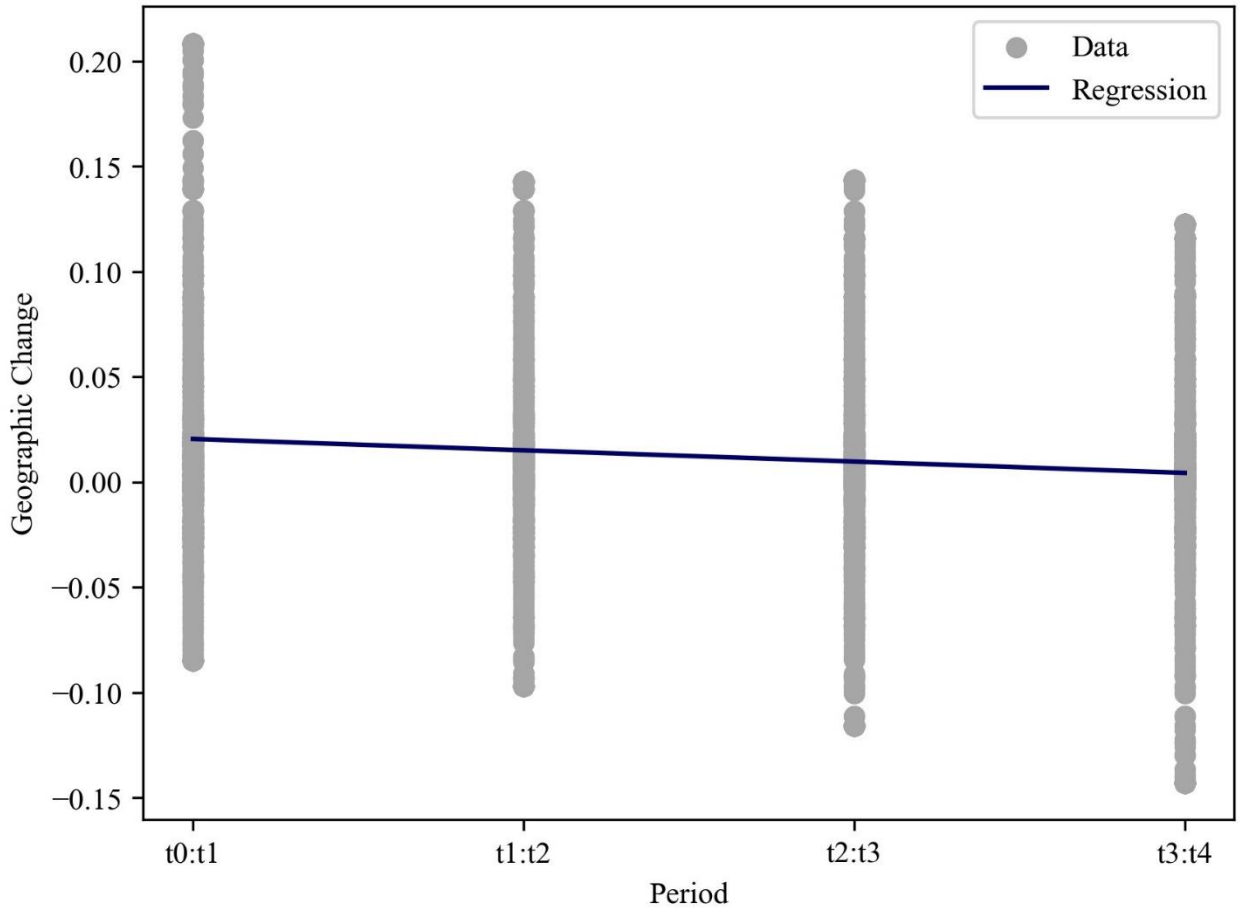
Result of Cross-period Analysis for Product Portfolio Change



Notes. N = 3,579. Quadratic positive relationship across the periods t_0:t_1 to t_3:t_4.

FIGURE 4

Result of Cross-period Analysis for Geographic Change



Notes. N = 2,046. Linear negative relationship across the periods t_0:t_1 to t_3:t_4.

TABLE 1

Dimensions of Strategic Change

Dimensions	Product portfolio change	Geographic change
Conceptual foundation	Product market change (Wiersema & Bantel, 1992)	International commitment (Sullivan, 1994)
Measure	Yearly change in product diversification (Entropy) (Jacquemin & Berry, 1979; Palepu, 1985)	Yearly change in geographic diversification (Sanders & Carpenter, 1998)

TABLE 2

Descriptive Statistics and Correlations

Variables	mean	std	min	max	1	2	3	4	5	6	7	8	9
1. SC_GEOt0:t1	0.07	0.7	-0.16	0.43	1								
2. SC_GEOt1:t2	0.01	0.09	-0.24	0.3	0.10	1							
3. SC_GEOt2:t3	0.02	0.13	-0.29	0.3	0.00	-0.02	1						
4. SC_GEOt3:t4	0.01	0.13	-0.29	0.25	0.01	0.15	0.03	1					
5. SC_PROD_PORTt0:t1	0.31	1.83	-0.5	14.31	-0.02	-0.05	-0.02	-0.01	1				
6. SC_PROD_PORTt1:t2	0.12	0.93	-0.43	6.75	-0.02	0.01	0.10	-0.02	0.01	1			
7. SC_PROD_PORTt2:t3	0.14	0.91	-0.49	6.75	0.00	0.00	0.00	0.03	-0.10	-0.03	1		
8. SC_PROD_PORTt3:t4	0.18	0.98	-0.53	6.75	-0.03	-0.03	0.00	0.00	0.02	-0.08	0.03	1	
9. CVC_ACTIV	2.41	1.77	0.00	4.73	-0.04	-0.01	-0.03	0.00	0.10	0.07	0.09	0.13	1
10. CULTURAL_DISTANCE	0.93	1.29	0	4.77	0.13	-0.05	-0.02	-0.06	-0.10	-0.06	-0.05	-0.10	-0.12
11. INDUSTRY_DISTANCE	0.82	0.31	0	1	0.03	0.01	-0.01	0.01	-0.13	-0.02	-0.09	-0.18	-0.03
12. ROA_UCP	0.1	0.08	-0.09	0.23	-0.03	0.02	0.09	0.16	0.07	-0.01	0.02	0.07	0.31
13. ROA_TARGET	-1.25	4.64	-2.74	0.15	-0.01	0.01	0.00	0.00	0.01	-0.02	0.01	0.00	-0.01
14. UCP_SIZE	10.9	0.97	1.47	12.78	0.01	0.02	-0.10	-0.04	0.12	0.01	0.11	0.12	0.24
15. TRANSACT_VALUE	2.38	1.25	-1.97	5.3	-0.05	0.00	-0.04	-0.01	0.02	0.07	0.06	0.02	0.30
16. CVC_TRANSACT_AGE	11.48	8.09	0	38	0.02	-0.01	-0.03	-0.04	-0.11	-0.09	-0.10	-0.14	0.24
17. M&A	0.1	0.29	0	1	-0.02	-0.01	0.06	-0.02	-0.05	-0.02	-0.04	-0.06	0.04
18. BUYBACK	0.2	0.4	0	1	0.15	-0.01	-0.04	-0.04	0.03	0.18	0.19	-0.07	-0.15
19. INTERFIRM_LINK	0.71	0.45	0	1	-0.12	-0.12	-0.13	-0.10	0.09	0.03	0.05	0.09	0.17
20. DOWNSIZING	0.7	0.46	0	1	-0.11	-0.05	-0.01	-0.05	0.01	0.02	0.05	0.10	0.18
21. SPIN-OFF	0.04	0.18	0	1	-0.02	-0.02	-0.02	-0.02	-0.02	-0.02	-0.03	-0.04	-0.08
22. IPO	0.05	0.21	0	1	-0.02	-0.03	-0.02	-0.03	0.48	-0.01	-0.06	-0.02	-0.05
23. FPO	0.52	0.5	0	1	0.06	0.01	-0.12	-0.08	0.04	0.07	0.07	0.10	0.10
24. POST_INVEST_MERGER	0.12	0.13	0	1	-0.01	-0.01	-0.01	-0.01	0.04	0.06	-0.02	0.05	0.00

Notes. Pearson's correlation matrix. The number of effect sizes varies according to the underlying strategic change dimension due to the distinction between domestic and cross-border transactions. Regarding the dependent variables: $N_{SC\_PROD\_PORT\ t0:t2}$ = 4,204, $N_{SC\_GEO\ t0:t1}$ = 2,547. However, we calculated the correlation on the basis of the entire database, ignoring the distinction between change activities, domestic and cross-border activities: N_{Full} = 2,920; Mean = mean effect size; SD = standard deviation; Min = Minimal value; Max = maximum value; Correlations with an absolute value greater than 0.05 are considered significant; two-tailed test.

Variables	10	11	12	13	14	15	16	17	18	19	20	21	22	23
10. CULTURAL_DISTANCE	1													
11. SIC_DISTANCE	0.09	1												
12. ROA_UCP	-0.20	-0.15	1											
13. ROA_TARGET	0.02	0.01	0.02	1										
14. UCP_SIZE	0.02	0.00	-0.03	0.07	1									
15. TRANSACT_VALUE	-0.02	-0.06	0.02	-0.03	0.14	1								
16. CVC_TRANSACT_AGE	-0.04	0.01	0.21	0.03	0.19	0.07	1							
17. M&A	0.05	0.09	-0.03	0.01	0.08	-0.02	0.11	1						
18. BUYBACK	-0.07	-0.19	0.08	0.00	0.19	0.02	-0.06	-0.08	1					
19. INTERFIRM_LINK	0.01	-0.06	-0.10	0.04	0.37	0.05	0.11	0.09	0.14	1				
20. DOWNSIZING	-0.16	-0.09	0.09	0.03	0.25	0.00	0.20	0.10	0.11	0.56	1			
21. SPIN-OFF	-0.04	-0.03	0.00	0.00	-0.15	-0.03	-0.11	0.11	0.11	0.03	0.04	1		
22. IPO	0.01	0.00	-0.08	0.00	0.09	0.01	-0.09	-0.04	-0.02	-0.01	-0.08	0.01	1	
23. FPO	-0.01	-0.01	-0.08	0.02	0.14	0.03	0.12	-0.06	-0.04	0.14	0.09	0.02	0.13	1
24. POST_INVEST_MERGER	-0.06	-0.04	0.01	0.00	0.05	0.06	-0.02	0.01	0.02	0.04	0.01	0.02	0.02	0.07

TABLE 3

Results of OLS Regression Analysis for Product Portfolio Change

	Product Portfolio Change							
	H1 t_0:t_1	H1 t_1:t_2	H1 t_2:t_3	H1 t_3:t_4	H2 t_0:t_1	H2 t_1:t_2	H2 t_2:t_3	H2 t_3:t_4
	0.017	0.009	0.015	0.016	0.027	0.022	0.025	0.034
CVC_ACTIV:	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.004)	(0.004)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
					0.029	0.013	0.012	0.030
INDUSTRY_DISTANCE:					(0.012)	(0.013)	(0.014)	(0.014)
					[0.014]	[0.324]	[0.412]	[0.036]
					-0.015	-0.016	-0.012	-0.019
MOD: INDUSTRY _DISTANCE:					(0.004)	(0.005)	(0.005)	(0.005)
					[0.000]	[0.000]	[0.012]	[0.000]
	0.098	-0.041	-0.198	0.248	0.101	-0.070	-0.190	0.278
Intercept:	(0.015)	(0.015)	(0.018)	(0.018)	(0.020)	(0.021)	(0.023)	(0.022)
	[0.000]	[0.008]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]
Control:								
	-0.041	0.013	0.127	0.124	-0.082	0.009	0.066	0.082
ROA_UCP:	(0.021)	(0.022)	(0.024)	(0.023)	(0.024)	(0.026)	(0.026)	(0.024)
	[0.044]	[0.547]	[0.000]	[0.000]	[0.001]	[0.721]	[0.012]	[0.001]
	0.001	-0.002	0.001	0.000	0.002	-0.002	0.001	0.000
ROA_TARGET:	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.002)	(0.000)	(0.000)
	[0.310]	[0.134]	[0.031]	[0.968]	[0.208]	[0.136]	[0.013]	[0.744]
	0.003	0.002	0.003	0.000	0.000	0.006	0.002	-0.004
UCP_SIZE:	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	[0.032]	[0.125]	[0.091]	[0.975]	[0.797]	[0.002]	[0.365]	[0.040]
	-0.005	0.003	-0.003	-0.001	-0.002	0.004	-0.004	-0.004
TRANSACT_VALUE:	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	[0.000]	[0.026]	[0.041]	[0.597]	[0.167]	[0.053]	[0.056]	[0.024]
	-0.001	-0.001	-0.001	-0.002	0.000	-0.001	-0.001	-0.001
CVC_TRANSACT_AGE:	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.269]	[0.000]	[0.000]	[0.000]
	-0.021	-0.024	-0.011	-0.006	-0.030	-0.015	-0.043	-0.013
M&A:	(0.007)	(0.007)	(0.010)	(0.010)	(0.008)	(0.010)	(0.011)	(0.011)
	[0.002]	[0.001]	[0.265]	[0.539]	[0.000]	[0.118]	[0.000]	[0.259]
	0.025	0.006	0.001	0.004	0.023	-0.006	0.006	0.015
BUYBACK:	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)
	[0.000]	[0.235]	[0.849]	[0.474]	[0.000]	[0.367]	[0.355]	[0.017]
	-0.009	-0.020	-0.008	-0.023	0.007	-0.028	-0.007	-0.024
INTERFIRM_LINK:	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
	[0.056]	[0.000]	[0.158]	[0.000]	[0.253]	[0.000]	[0.350]	[0.001]
	-0.019	0.011	0.000	0.017	-0.031	-0.001	-0.004	0.017
DOWNSIZING:	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
	[0.000]	[0.046]	[0.976]	[0.006]	[0.000]	[0.841]	[0.611]	[0.018]
	-0.016	-0.014	-0.017	-0.024	-0.010	-0.027	-0.011	-0.017
SPIN-OFF:	(0.007)	(0.009)	(0.009)	(0.009)	(0.009)	(0.011)	(0.011)	(0.010)
	[0.030]	[0.111]	[0.067]	[0.011]	[0.274]	[0.011]	[0.328]	[0.098]
	0.053	0.077	0.065	0.032	0.042	0.055	0.067	0.046
IPO:	(0.008)	(0.007)	(0.009)	(0.008)	(0.010)	(0.010)	(0.011)	(0.009)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
	-0.025	-0.029	-0.028	-0.008	-0.015	-0.034	-0.023	-0.003
FPO:	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)
	[0.000]	[0.000]	[0.000]	[0.144]	[0.002]	[0.000]	[0.000]	[0.567]
	0.008	-0.007	0.016	0.008	0.004	-0.020	0.026	-0.008
POST_INVEST_MERGER:	(0.012)	(0.014)	(0.015)	(0.015)	(0.014)	(0.017)	(0.017)	(0.017)
	[0.523]	[0.607]	[0.291]	[0.614]	[0.769]	[0.247]	[0.128]	[0.629]
Model information:								
N:	4204	3926	3570	3231	2774	2582	2410	2241
R^2-adjusted:	0.202	0.259	0.288	0.269	0.224	0.237	0.315	0.31
R^2:	0.209	0.266	0.295	0.276	0.235	0.247	0.325	0.321
	31.427	41.381	44.765	38.059	22.659	23.215	32.594	30.654
F-statistic:	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes. Multivariate regression analysis. Standard errors are in parentheses and p-values in brackets. Year-fixed effects are included but not reported.

TABLE 4

Results of OLS Regression Analysis for Geographic Change

	Geographic Change							
	H3 t_0:t_1	H3 t_1:t_2	H3 t_2:t_3	H3 t_3:t_4	H4 t_0:t_1	H4 t_1:t_2	H4 t_2:t_3	H4 t_3:t_4
	0.000	0.001	0.002	0.001	0.005	0.006	0.005	0.002
CVC_ACTIV:	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
	[0.826]	[0.128]	[0.016]	[0.095]	[0.000]	[0.000]	[0.002]	[0.140]
					0.007	0.004	0.002	0.001
CULTURAL_DISTANCE:					(0.001)	(0.001)	(0.002)	(0.002)
					[0.000]	[0.013]	[0.250]	[0.524]
					-0.003	-0.002	-0.001	0.000
MOD:CULTURAL_DISTANCE:					(0.001)	(0.001)	(0.001)	(0.001)
					[0.000]	[0.000]	[0.043]	[0.436]
	-0.009	-0.016	-0.052	0.022	-0.021	-0.024	-0.054	0.019
Intercept:	(0.015)	(0.015)	(0.015)	(0.016)	(0.015)	(0.015)	(0.015)	(0.017)
	[0.554]	[0.294]	[0.001]	[0.174]	[0.163]	[0.119]	[0.000]	[0.251]
Control:								
	-0.074	0.016	0.050	0.037	-0.075	0.011	0.047	0.039
ROA_UCP:	(0.013)	(0.013)	(0.014)	(0.017)	(0.013)	(0.013)	(0.014)	(0.018)
	[0.000]	[0.242]	[0.000]	[0.033]	[0.000]	[0.414]	[0.001]	[0.029]
	-0.002	0.001	-0.005	0.001	-0.002	0.001	-0.005	0.001
ROA_TARGET:	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
	[0.263]	[0.612]	[0.052]	[0.570]	[0.301]	[0.532]	[0.059]	[0.574]
	0.004	0.000	0.003	0.001	0.004	0.000	0.003	0.001
UCP_SIZE:	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.806]	[0.012]	[0.260]	[0.000]	[0.821]	[0.015]	[0.302]
	-0.002	-0.002	-0.001	0.000	-0.002	-0.002	-0.001	0.000
TRANSACT_VALUE:	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.047]	[0.054]	[0.153]	[0.995]	[0.016]	[0.046]	[0.124]	[0.749]
	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CVC_TRANSACT_AGE:	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.052]	[0.305]	[0.392]	[0.769]	[0.051]	[0.307]	[0.406]	[0.976]
	0.005	-0.009	-0.002	-0.003	0.007	-0.007	-0.001	-0.003
M&A:	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
	[0.180]	[0.024]	[0.576]	[0.486]	[0.055]	[0.085]	[0.868]	[0.550]
	0.007	0.018	-0.004	0.002	0.007	0.017	-0.004	0.002
BUYBACK:	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.009]	[0.000]	[0.222]	[0.485]	[0.014]	[0.000]	[0.217]	[0.413]
	-0.011	-0.008	-0.006	0.001	-0.011	-0.008	-0.006	0.000
INTERFIRM_LINK:	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.011]	[0.073]	[0.793]	[0.000]	[0.005]	[0.054]	[0.994]
	-0.006	-0.012	-0.009	-0.006	-0.003	-0.012	-0.009	-0.004
DOWNSIZING:	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.018]	[0.000]	[0.002]	[0.045]	[0.175]	[0.000]	[0.002]	[0.132]
	-0.005	-0.001	-0.009	0.012	-0.005	-0.002	-0.010	0.011
SPIN-OFF:	(0.005)	(0.006)	(0.008)	(0.008)	(0.005)	(0.006)	(0.008)	(0.008)
	[0.393]	[0.859]	[0.243]	[0.151]	[0.387]	[0.673]	[0.178]	[0.182]
	-0.020	-0.012	-0.009	-0.023	-0.024	-0.012	-0.009	-0.023
IPO:	(0.005)	(0.006)	(0.006)	(0.006)	(0.005)	(0.006)	(0.006)	(0.006)
	[0.000]	[0.031]	[0.167]	[0.000]	[0.000]	[0.029]	[0.148]	[0.000]
	-0.005	-0.003	-0.002	0.002	-0.005	-0.004	-0.002	0.003
FPO:	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)
	[0.042]	[0.153]	[0.426]	[0.491]	[0.026]	[0.120]	[0.507]	[0.288]
	0.006	-0.002	0.008	0.004	0.005	-0.002	0.007	0.006
POST_INVEST_MERGER:	(0.007)	(0.007)	(0.008)	(0.009)	(0.007)	(0.007)	(0.008)	(0.009)
	[0.423]	[0.803]	[0.357]	[0.653]	[0.460]	[0.771]	[0.393]	[0.534]
Model information:								
N:	2547	2363	2141	1921	2523	2344	2126	1887
R^2-adjusted:	0.101	0.129	0.11	0.135	0.112	0.136	0.111	0.133
R^2:	0.113	0.142	0.124	0.15	0.125	0.149	0.126	0.149
	9.149	11.332	9.027	10.392	9.568	11.207	8.582	9.501
F-statistic:	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

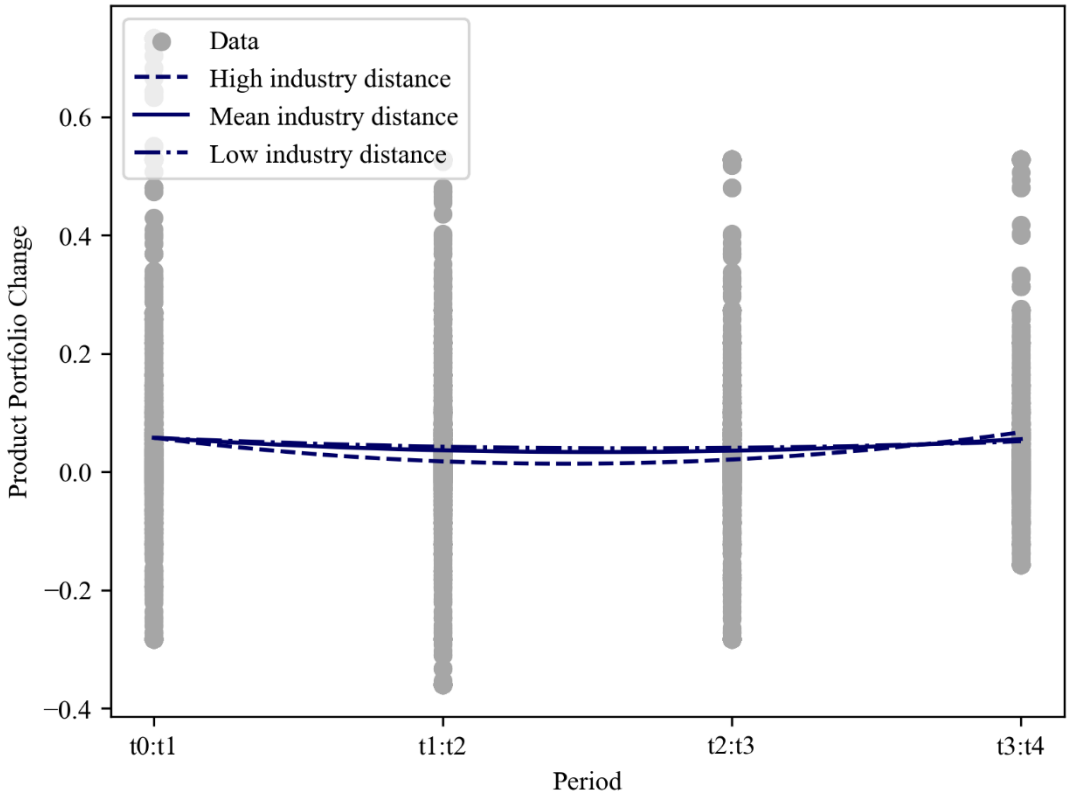
Notes. Multivariate regression analysis. Standard errors are in parentheses and p-values in brackets. Year-fixed effects are included but not reported.

APPENDICES

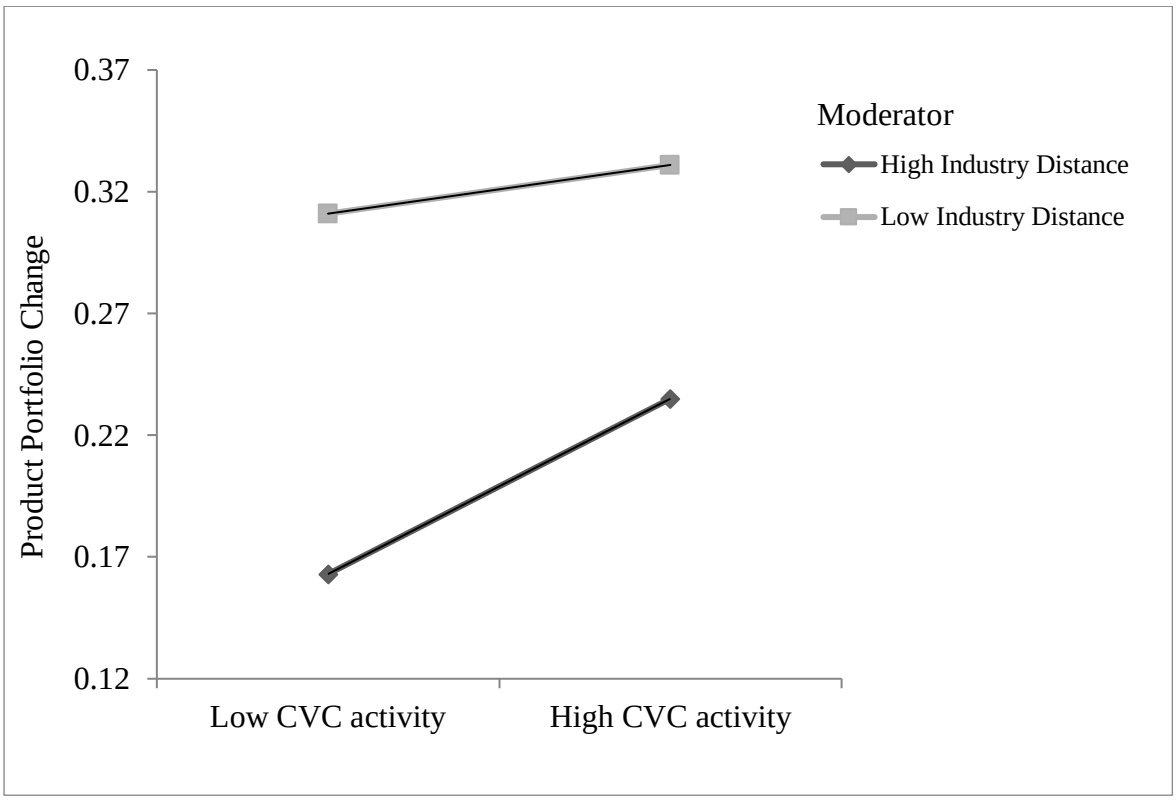
APPENDIX 1

Moderation Effect of Industry Distance

The following chart demonstrates the moderating effect of cultural distance on the relationship between CVC activity and product portfolio change over the period t_0:t_1 to t_3:t_4.



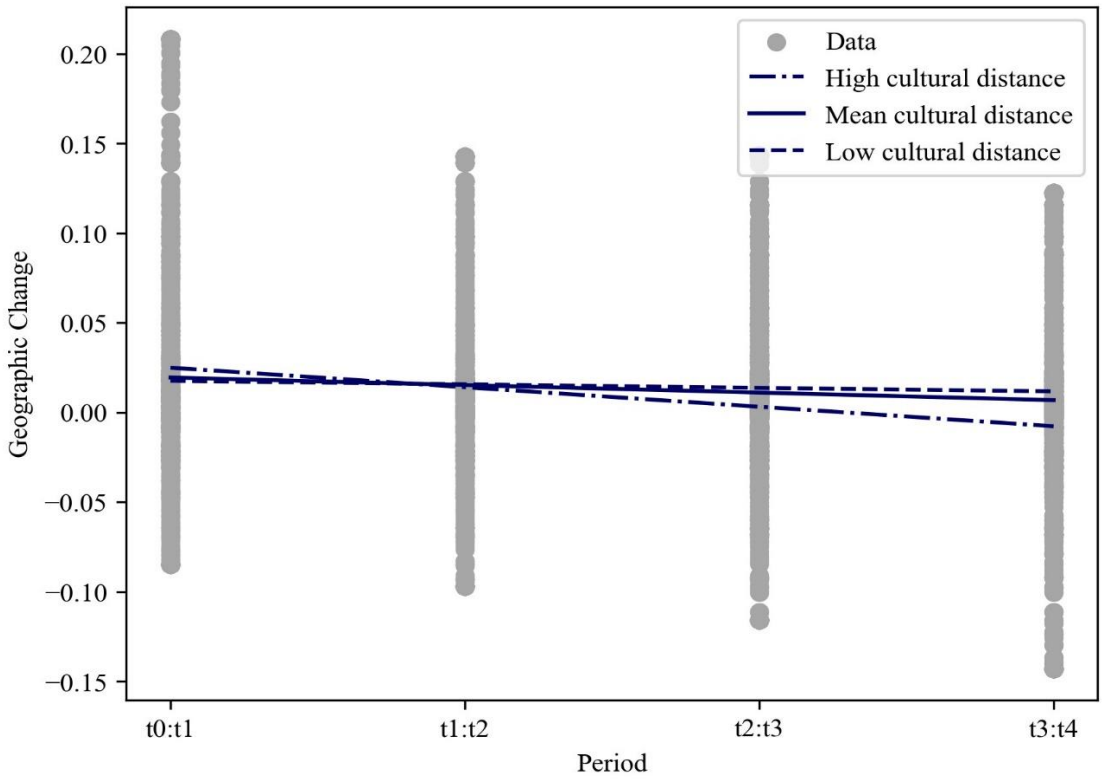
To illustrate our argument, we calculated a composite CVC activity variable by encompassing the change from period t_0:t_4 and plotted the results. The following chart supports our two arguments: a) more CVC activity leads to higher product portfolio change, and b) the less the distance between the parent and target firm (low industry distance), the more the parent firm focuses on adjusting its business activities (i.e., high product portfolio change).


0.37
0.32
0.27
0.22
0.17
0.12
Product Portfolio Change
Low CVC activity
High CVC activity
Moderator
High Industry Distance
Low Industry Distance

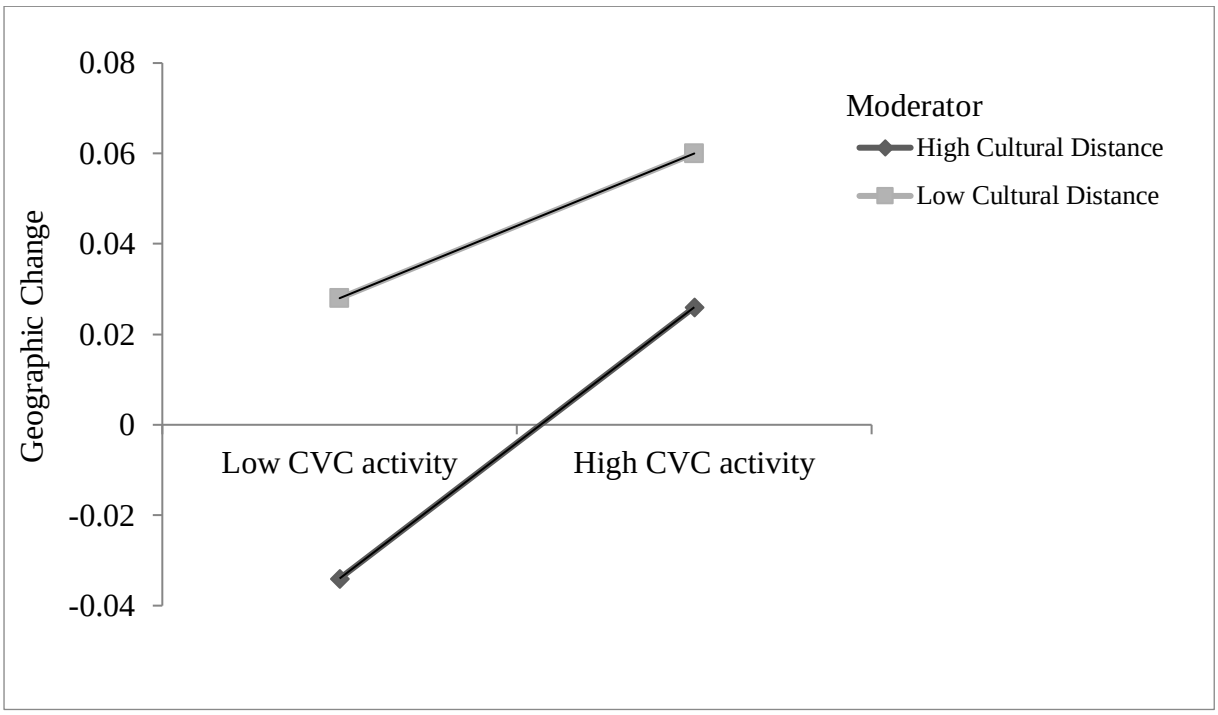
APPENDIX 2

Moderation Effect of Cultural Distance

The following chart demonstrates the moderating effect of cultural distance on the relationship between CVC activity and geographic change over the period t_0:t_1 to t_3:t_4.



To illustrate our argument, we calculated a composite CVC activity variable by encompassing the change from period t_0:t_4 and plotted the results. The following chart supports our two arguments: a) more CVC activity leads to higher geographic change, and b) the less culturally distant the venture (= low cultural distance), the more the parent firm intensifies its international business activities (= high geographic change).


0.08
0.06
0.04
0.02
0
-0.02
-0.04
Geographic Change
Low CVC activity
High CVC activity
Moderator
High Cultural Distance
Low Cultural Distance

APPENDIX 3

Overview of Variable Measurements

The table presents the measurements of the variables used in the analysis.

Variable	Measurement
CVC Activity (CVC_ACTIV)	Logarithmized accumulated value of individual transactions of CVC units on a yearly basis. $$CVC\ activity = \frac{\frac{\sum H_{Tx}}{S_{Tx}}}{Year_{Tx-T0}}$$ H: logarithmized cumulative value of a CVC unit's current and past transactions on an annual basis. S: firm size measured by the logarithm of the firm's total assets, adjusted for historical exchange rates Year: transaction year minus founding year of CVC unit
Geographic Change (SC_GEO)	Annual difference from t_0:t_1 to t_3:t_4 of Sullivan's geographic diversification composite measure (Sullivan, 1994): Sum of (1) the ratio of foreign sales to total sales, (2) foreign assets divided by total assets, and (3) the number of country subsidiaries of the respective UCP, a percentage based on the highest value in the sample.
Product portfolio change (SC_PROD_PORT)	Annual difference from t_0:t_1 to t_3:t_4 of product market diversification (Westphal & Fredrickson, 2001). Product market diversification is operationalized using the entropy measure, which takes into account the number of segments respectively industries in which a firm operates and weighs each segment according to its contribution to total sales. The index ranges from 0 to 1 (Palepu, 1985).
Industry distance (INDUSTRY_DISTANCE)	SIC code overlap between UCP and target firm with values between zero (completely identical SIC codes) to one (completely different SIC codes) (Wadhwa & Basu, 2013).
Cultural distance (CULTURAL_DISTANCE)	Cultural distances between UCP and the target firm are based on Kogut and Singh's cultural-distance index along Hofstede's cultural dimensions of the country where their headquarters are located (Kogut & Singh, 1988).
Firm size (UCP_SIZE)	Natural logarithm of total assets of the UCP at t_0 adjusted to the historical exchange rate in US dollar, while t is the year of the announcement.
Age (CVC_TRANSACT_AGE)	The year the transaction was announced minus the founding year of the CVC unit.
Prior performance (ROA_UCP, ROA_TARGET)	Net income divided by average total assets at t_{-1}, while t is the year of the announcement.
CVC transaction's magnitude (TRANSACT_VALUE)	Natural logarithm of the value of the transaction (in Mio. USD) given by the database.
IPO, FPO, buyback, M&A activities, downsizing, spin-off, and other interfirm linkages, like strategic alliances or joint ventures	Binary variable, coded as one if specific parent firm activities occur within a timeframe of two years before the CVC transaction (t_{-2}:t_0).
Post-investment merger	Binary variable, coded as one if the UCP or the associated CVC unit purchased the target within five years (t_0:t_4) after the investment.

APPENDIX 4

Results of OLS Regression Analysis without CVC activity

	Product Portfolio Change				Geographic Change			
	H1 t_0:t_1	H1 t_1:t_2	H1 t_2:t_3	H1 t_3:t_4	H3 t_0:t_1	H3 t_1:t_2	H3 t_2:t_3	H3 t_3:t_4
	0.086	-0.049	-0.208	0.243	-0.009	-0.015	-0.050	0.024
Intercept:	(0.015)	(0.015)	(0.018)	(0.018)	(0.015)	(0.015)	(0.015)	(0.016)
	[0.000]	[0.002]	[0.000]	[0.000]	[0.549]	[0.307]	[0.001]	[0.136]
Control:								
	0.015	0.044	0.172	0.180	-0.074	0.018	0.054	0.041
ROA_UCP:	(0.021)	(0.022)	(0.024)	(0.023)	(0.013)	(0.013)	(0.014)	(0.017)
	[0.476]	[0.041]	[0.000]	[0.000]	[0.000]	[0.183]	[0.000]	[0.018]
	0.001	-0.002	0.001	0.000	-0.002	0.001	-0.004	0.001
ROA_TARGET:	(0.001)	(0.001)	(0.000)	(0.000)	(0.002)	(0.002)	(0.002)	(0.002)
	[0.449]	[0.114]	[0.051]	[0.884]	[0.256]	[0.541]	[0.072]	[0.515]
	0.006	0.004	0.005	0.002	0.004	0.000	0.003	0.002
UCP_SIZE:	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.000]	[0.004]	[0.001]	[0.157]	[0.000]	[0.655]	[0.006]	[0.232]
	0.000	0.006	0.002	0.004	-0.002	-0.001	-0.001	0.000
TRANSACT_VALUE:	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
	[0.707]	[0.000]	[0.274]	[0.012]	[0.042]	[0.082]	[0.241]	[0.893]
	-0.001	-0.001	-0.001	-0.002	0.000	0.000	0.000	0.000
CVC_TRANSACT_AGE:	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	[0.008]	[0.000]	[0.000]	[0.000]	[0.053]	[0.171]	[0.135]	[0.435]
	-0.016	-0.022	-0.015	-0.013	0.005	-0.010	-0.003	-0.004
M&A:	(0.007)	(0.007)	(0.010)	(0.010)	(0.004)	(0.004)	(0.004)	(0.004)
	[0.022]	[0.003]	[0.123]	[0.212]	[0.171]	[0.014]	[0.424]	[0.400]
	0.017	0.002	-0.005	-0.003	0.007	0.017	-0.004	0.002
BUYBACK:	(0.005)	(0.005)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.774]	[0.363]	[0.662]	[0.009]	[0.000]	[0.184]	[0.552]
	0.004	-0.013	0.005	-0.008	-0.011	-0.008	-0.006	0.001
INTERFIRM_LINK:	(0.005)	(0.005)	(0.006)	(0.006)	(0.003)	(0.003)	(0.003)	(0.003)
	[0.433]	[0.011]	[0.345]	[0.164]	[0.000]	[0.011]	[0.064]	[0.829]
	-0.018	0.011	0.001	0.021	-0.006	-0.012	-0.008	-0.005
DOWNSIZING:	(0.005)	(0.005)	(0.006)	(0.006)	(0.002)	(0.003)	(0.003)	(0.003)
	[0.000]	[0.033]	[0.880]	[0.001]	[0.017]	[0.000]	[0.004]	[0.063]
	-0.024	-0.019	-0.027	-0.033	-0.005	0.000	-0.009	0.012
SPIN-OFF:	(0.008)	(0.009)	(0.010)	(0.009)	(0.005)	(0.006)	(0.008)	(0.008)
	[0.001]	[0.027]	[0.004]	[0.001]	[0.383]	[0.954]	[0.256]	[0.138]
	0.046	0.077	0.066	0.033	-0.020	-0.013	-0.009	-0.023
IPO:	(0.008)	(0.007)	(0.009)	(0.008)	(0.005)	(0.006)	(0.006)	(0.006)
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.027]	[0.152]	[0.000]
	-0.023	-0.030	-0.028	-0.008	-0.005	-0.003	-0.002	0.002
FPO:	(0.004)	(0.004)	(0.005)	(0.005)	(0.002)	(0.002)	(0.003)	(0.002)
	[0.000]	[0.000]	[0.000]	[0.112]	[0.038]	[0.199]	[0.531]	[0.386]
	0.009	-0.010	0.012	0.004	0.006	-0.002	0.007	0.004
POST_INVEST_MERGER:	(0.012)	(0.014)	(0.016)	(0.015)	(0.007)	(0.007)	(0.008)	(0.009)
	[0.473]	[0.472]	[0.433]	[0.793]	[0.421]	[0.787]	[0.384]	[0.679]
Model information:								
N:	4204	3926	3570	3231	2547	2363	2141	1921
R^2-adjusted:	0.163	0.25	0.267	0.243	0.101	0.129	0.108	0.135
R^2:	0.17	0.256	0.274	0.25	0.113	0.141	0.121	0.148
F-statistic:	25.079	40.572	41.686	34.401	9.420	11.599	9.109	10.627
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]

Notes. Multivariate regression analysis. Standard errors are in parentheses and p-values in brackets. Year-fixed effects are included but not reported.

STUDY 3:

MOVE TO THE BEAT. BUT FOR REAL! HOW THE EXTERNAL ENVIRONMENT SHAPES THE RELATIONSHIP BETWEEN RHYTHMS OF STRATEGIC CHANGE AND FIRM PERFORMANCE

Christian Kaiser
Department of Strategic and International Management, Justus-Liebig-University
Licher Strasse 62, 35394 Gießen, Germany
Christian.Kaiser@wirtschaft.uni-giessen.de
Phone: +49 641 99 22438

ABSTRACT

This study examines the relationship between rhythms of strategic change and long-term firm performance. While extant research into the relationships between (ir)regularity of change rhythms and firm performance underlines the importance of time and temporality, it has neglected heterogeneity in the temporal characteristics of a firm's external environment as an important contingency. Grounded in the literature on tensions of change-stability and temporal entrainment, we argue that the temporality of the firms' external environment – industry dynamism and industry clockspeed – moderate the relationships between rhythms of strategic change and firm performance. To test our theoretical predictions, we conducted two empirical studies using the same sample of S&P 500 firms. The first study relied on a more traditional approach to capture strategic change, similar to those used in prior studies. The second study employed a more modern approach to exploit the opportunities of automated text analysis. The results of both studies provide consistent and robust empirical support for our predictions. This study makes theoretical and methodological contributions to strategic change research by advancing a more complex understanding of the relationships between rhythms of strategic change and firm performance and by introducing a robust, text-based method for analyzing strategic change.

Keywords: strategic change, firm performance, change-stability, entrainment, industry dynamism, industry clockspeed, text-analysis

INTRODUCTION

Among scholars seeking to understand the strategic behavior of firms, a central concern is strategic change – defined as the alignment between the internal and external environment – and its impact on firm performance and long-term survival (e.g., Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997; Zajac & Kraatz, 1993). A small, albeit significant, stream of research has emerged that focusses on strategic change as a series of change events rather than considering them as a singular and isolated event (e.g., Kanitz, Huy, Backmann, & Hoegl, 2022; Zhang, Priem, Wang, & Li, 2023). These studies foreground temporal aspects in strategic change, such as the interconnectedness of individual strategic change events and the temporal order of change and stability over time matter for organizational outcomes. For example, Klarner and Raisch (2013) studied the temporal order of multiple strategic change events over time, i.e., the rhythm of change, and revealed that strategic change rhythms (regular vs. irregular) are associated with long-term firm performance.

The purpose of this study is to contribute to this line of research by developing a more contextualized understanding of the relationship between the rhythms of strategic change and firm performance that accounts for temporal heterogeneity in the firms' external environments. Although the extant research on strategic change has repeatedly stressed the importance of alignment between the firms' internal and external alignment, the existing empirical studies on multiple change events have focused on single industries (e.g., Klarner & Raisch, 2013). Notably, Klarner and Raisch's (2013) analysis of heterogeneity in environmental dynamisms suggests differences (although their results lacked empirical support for differences within the same industry). This may be due to empirical issues (low sample size) or simply because of their focus on one industry. As a consequence, we still do not know whether the positive relationship between regular change rhythms is generalizable across different industries and whether or not the nature of this relationship is influenced by temporal characteristics of the external environment.

We ground our study in the literature on change-stability (Farjoun, 2010; Klarner & Raisch, 2013; Leana & Barry, 2000) and integrate research on time and temporality, with a particular focus on temporal entrainment (e.g., Ancona & Chong, 1996; Pérez-Nordtvedt, Payne, Short, & Kedia, 2008). Drawing on change-stability research, we submit a first set of hypotheses on the relationship between (ir)regular change rhythms and long-term success. We submit competing hypotheses because the literature does not provide conclusive arguments to support only one of the two relationships. In line with the purpose of our study, our main interest centers on the role of the external environments as an important contingency rather than on the direct relationships.

To develop our second set of hypotheses, we draw on entrainment theory (Pérez-Nordtvedt et al., 2008; Sandra, Segers, & Giacalone, 2023) and its key premise that firms synchronize their internal processes with external environmental rhythms. Building on two key types of entrainment – 'phase,' which involves aligning the timing of activities, and 'tempo,' which entails matching the speed of activities – we develop our second set of hypotheses and argue that alignment of the change rhythms with the temporal characteristics of the external environment is positively associated with long-term firm performance. By aligning the phase and tempo of their internal activities with the external environment, firms can better manage to maintain competitiveness and avoid misalignments, which in turn can negatively impact performance. More specifically, we argue that industry dynamism and industry clockspeed moderate the relationship between (ir)regular strategic change rhythms and firm performance.

To test our theoretical predictions, we conducted two related empirical studies with the same sample of S&P 500 firms over ten years from 2014 to 2023. The first study followed a more traditional approach similar to Klarner and Raisch (2013). Second, we employed a novel approach based on annual reports, utilizing a topic-analyzing, text-based method to measure strategic change. The two studies revealed similar results. While the studies found no empirical

support for a positive relationship between regular change rhythms and firm performance, our findings provide substantial empirical evidence supporting the opposite.

Moreover, our findings provided robust empirical support for the contingency hypotheses. Consequently, irregular change was observed to be more effective than regular change in high-dynamic and fast-paced industries. Conversely, in low-dynamic and slow-paced environments, regular change was identified as a more advantageous approach.

This study contributes to the growing research on the dynamics of strategic change. First, this study advances scholarly knowledge about strategic change as a sequence of change events rather than a single event (e.g., Kanitz et al., 2022; Klarner & Raisch, 2013). More specifically, our study challenges the generalizability of prior findings regarding the relationship between rhythms of change and long-term firm performance. It suggests that the relationships are rather contingent on the external environment and, thus, more complex than previously thought. Second, our study contributes to the temporal perspective on strategic change. Specifically, we highlight the role of temporal alignment between internal and external environments. Third, this study offers a methodological contribution by introducing a more automated approach to measuring strategic change. While time-consuming data collection has often impeded studying strategic change dynamics, our approach facilitates especially more longitudinal studies of strategic change dynamics. Through these contributions, this study aspires to enrich the discourse on strategic management and provide valuable insights for academics and practitioners.

BACKGROUND

Broadly, strategic change is defined as the alignment between the internal and external environment (e.g., Greiner & Bhambri, 1989; Rajagopalan & Spreitzer, 1997; Schepker, Kim, Patel, Thatcher, & Campion, 2017; van de Ven & Poole, 1995). In other words, an organization modifies its strategies and operational procedures in order to better align with external environmental influences (e.g., Herrmann & Nadkarni, 2014; Rajagopalan & Spreitzer, 1997;

van de Ven & Poole, 1995). Respectively, "strategic change, such as entering new markets, refreshing the product portfolio, and changing resource allocation among departments, is essential to realigning the firm with the environment and increasing performance" (Schepker et al., 2017, p. 705). This alignment necessitates adaptations to the strategy over time and is influenced by various environmental and organizational conditions, which may result in either radical or gradual transformations (Greiner & Bhambri, 1989).

Our paper broadly aims to contribute to the existing knowledge about the implications of strategic change. Scholars have extensively studied the relationship between strategic change and its impact on firm performance. The extant research is highly diverse, encompassing various methodologies, perspectives, and insights. Some studies report positive findings (e.g., Sewaid, Garcia-Cestona, & Silaghi, 2022; Zajac & Kraatz, 1993), while others indicate adverse outcomes (e.g., Klink, 2016; Naranjo-Gil, 2015), and some even show mixed results (e.g., Ndofor, Vanevenhoven, & Barker, 2013; Zhang & Rajagopalan, 2010). The bottom line is that while most studies, albeit not all, suggest a positive relationship between strategic change and long-term performance, the existing knowledge is still inconclusive.

Insert Table 1 about here.

Our analysis of the extant research suggests that the understanding of the relationship between strategic change and firm performance is hampered by three shortcomings: *First*, the vast majority of the extant research has focused on strategic change as single and isolated events (see column 'Research Design' in Table 1). By focusing on individual changes rather than multiple changes, existing research falls short of capturing the complexity of strategic change and its implications for firm performance and survival. Considering strategic change as a series of interconnected events could provide deeper insights into its effects, potentially leading to more robust and comprehensive findings in the field. A comprehensive understanding requires

viewing strategic change as an ongoing interplay between change and stability to uncover more profound insights into its impact on firm performance.

Second, the extant research has predominantly focused on static (cross-sectional) analyses rather than longitudinal studies that can provide a more comprehensive understanding of the dynamics of strategic change. Most studies adopt cross-sectional approaches, while only a minority utilize longitudinal approaches. Often, these differences occur due to different temporal perspectives (Kunisch, Bartunek, Mueller, & Huy, 2017), like short- and long-term performance (e.g., Naranjo-Gil, 2015; Schepker et al., 2017).

Third, empirical approaches to measure strategic change have hampered more dynamic research. For the most part, the existing studies have either relied on financial measures (e.g., using differences in diversification degrees or firms' spending) or firms' indications of their course of action in communication, such as annual reports and surveys, to capture strategic change (Appendix 1). Both of these approaches have limitations. While the former allows to capture larger samples, it does not allow to capture sequences of actions. The latter enables capturing sequences of actions but results in rather small samples due to the high manual effort required. For instance, Klarner and Raisch (2013) engaged in extensive manual data collection to capture strategic change. Probably because of the efforts related to this manual research work, they focused on a single 2-digit SIC industry. This focus on a single industry not only limits the generalizability of their findings to other industry and country settings but also results in a relatively low sample size, which challenges the validity of the empirical analyses.

In this paper, we aim to address these shortcomings in the extant research on the performance implications of strategic change. To advance our knowledge about the dynamics of strategic change, we focus on the relationship between change rhythms and firm performance. The purpose of this study is to test the generalizability of prior findings and explore the contingent role in the external environment.

THEORY AND HYPOTHESES

Our conceptual model suggests that the relationship between strategic change rhythms and long-term firm performance is moderated by the external environment. In the following, we develop two sets of hypotheses. The first set of hypotheses concerns the influence of different strategic change rhythms on long-term firm performance. The second set of hypotheses focusses on the moderating effects of the temporal characteristics of the external environment. Figure 1 summarizes our conceptual model.

Insert Figure 1 about here.

Baseline Hypotheses: Rhythm of Strategic Change

The change-stability literature highlights the inherent tension between the need to adapt to changing environments and the importance of maintaining stability (e.g., Farjoun, 2010; Leana & Barry, 2000; Zhang et al., 2023). Accordingly, this framework presents the simultaneous presence of contradictory elements where firms must adapt and evolve to remain competitive while also striving to maintain a level of stability to reduce uncertainty and consolidate routines and knowledge (Quinn & Cameron, 1988).

While adapting to evolving market conditions and competitive pressures can drive innovation and growth, change can disrupt a well-functioning organization. In contrast, while maintaining continuity can facilitate operational efficiency, stability can also lead to organizational inertia and misalignment with external. Therefore, previous studies highlight organizations' dual need to change and maintain stability to ensure long-term effectiveness (e.g., March, 1991). As an illustration, Leana and Barry (2000) demonstrate that stability and change are not merely opposing forces but are intricately intertwined and must be managed collectively within firms. Furthermore, Farjoun (2010) extends this discussion by suggesting that stability and change are mutually enabling, proposing a duality perspective that integrates both elements

rather than viewing them as separate and conflicting. Recent studies have examined managing methods for ensuring change and stability (Rosales, Gaim, Berti, & Pina e Cunha, 2022). These tensions are also reflected in classic strategy works. For example, Mintzberg (1978, p. 941) already argued: "Strategy formation can fruitfully be viewed as the interplay between a dynamic environment and bureaucratic momentum, with leadership mediating between the two forces; that strategy formation over time appears to follow some important patterns in organizations, notably life cycles and distinct change-continuity cycles within these."

The ongoing tension between change and stability turns the spotlight on the *rhythm* of strategic change. The rhythm of change concerns the timing of multiple changes implemented in a specific period. More specifically, the interval between the phases of change and the recurrence of the change determines the rhythm (e.g., Klarner & Raisch, 2013; Kunisch et al., 2017). According to prior research (e.g., Klarner & Raisch, 2013), change rhythms can be characterized as regular and irregular. A regular rhythm is defined as one that features consistent time intervals between adjacent activities (Turner, Mitchell, & Bettis, 2013). In contrast, firms with irregular rhythms tend to cluster their activities' timing (Maitland, Rose, & Nicholas, 2005), while change and stability periods vary significantly in duration (Klarner & Raisch, 2013).

Our first baseline hypothesis focusses on regular change rhythm. We follow Klarner and Raisch (2013), who posit that maintaining a regular rhythm in organizational processes benefits long-term performance because of its stability. This rhythm assists in maintaining equilibrium between the lengths of periods of stability. On the one hand, if they are too short, organizations may be overwhelmed by excess information and reduced time available for processing it (Dierickx & Cool, 1989; Hambrick, Finkelstein, & Mooney, 2005). During these periods, organizations may encounter difficulties in developing routines that enhance stability, as the development of routines necessitates a significant investment of time (Levinthal & March, 1981; March, 1981).

Conversely, extended stability phases may result in organizational inertia (Hannan & Freeman, 1984) and competency traps (Levinthal & March, 1993). Such instances result in organizational resistance to change, leading to stagnation (Klarner & Raisch, 2013) and impeding adaptability (Amburgey & Miner, 1992). In light of the above, Klarner and Raisch (2013) posit that a regular rhythm mitigates the risks associated with excessive stability and change. Regularity in change processes provides stability, allowing management adequate time to assess and learn from past changes, thereby reducing the risk of managerial overload and ineffective decision-making. As they argue:

> ***Hypothesis 1a (H1a)****: A regular change rhythm is associated with a higher long-term firm performance than an irregular change rhythm.*

Our second baseline hypothesis focusses on irregular change rhythms and flexibility. While Klarner and Raisch (2013) argue for the superiority of stability, the change-stability literature is less clear about this. Thus, our contrasting viewpoint emphasizes the importance of maintaining flexibility.

A regular strategic change rhythm is distinguished by a consistent and predictable pattern of transformation efforts, which can help balance the organizational need for change and stability. Consequently, firms that maintain this type may be inclined to implement incremental adjustments repeatedly to maintain alignment with the established rhythm rather than directing their attention toward the strategic pursuit of pivotal, long-term initiatives. This may result in inefficient use of capital, time, and labor. Consequently, this type of change limits firms' flexibility to react quickly to unforeseen external market changes due to the tied-up resources and ongoing internal change processes. This ultimately harms competitive advantage.

In contrast, from a conceptual standpoint, irregular change acknowledges that firms operate within dynamic environments where unwavering adherence to fixed intervals may not always be feasible or desirable. Accordingly, irregular change patterns contribute to firms'

continued flexibility and adaptability, thereby conferring a strategic advantage by enabling firms to respond more effectively to evolving challenges and opportunities. Conversely, change enhances learning over time, thereby providing organizations with a greater number of potential responses (Farjoun, 2010). This resulted in an enhancement of change variation, which enables individuals to better cope with unforeseen events through anticipation and adaptive reaction (Pentland & Rueter, 1994). Consequently, performance is more stable. Moreover, irregular change enables firms to capitalize on emerging strategic opportunities without having to wait for the next regular change "cycle" due to resource occupation. This approach eliminates redundant changes that consume resources that could otherwise be invested in competitive advantage. It ensures that changes are only made when they offer genuine added value, thereby reinforcing long-term competitiveness and positive long-term performance.

In conclusion, irregular change can be employed as a strategic approach during periods of turbulence to maintain stability. This is accomplished by implementing changes only when they are strategically necessary. Furthermore, it encourages adaptability and innovation by enabling firms to respond rapidly to unforeseen market shifts and to invest selectively in pioneering endeavors. Lastly, it fosters strategic prioritization and resource efficiency by ensuring that changes are made only when they promise high strategic value, facilitating more efficient resource utilization. Consequently, firms that pursue irregular change are more effective due to their flexibility than those that adhere to a regular change pattern. Thus, we conclude:

> ***Hypothesis 1b (H1b):*** *An irregular change rhythm is associated with a higher long-term firm performance than a regular change rhythm.*

Moderating Hypotheses: Alignment with Temporalities of the External Environment

Our definition is consistent with previous research (e.g., Greiner & Bhambri, 1989; Herrmann & Nadkarni, 2014; Rajagopalan & Spreitzer, 1997; Schepker et al., 2017; van de

Ven & Poole, 1995), the alignment of an organization with its external environment is a crucial factor in the context of strategic change. Klarner and Raisch's (2013) study was primarily focused on the internal perspective of organizations in a single industry context. This narrow focus may have resulted in the backgrounding of heterogeneity of environmental context, which, however, seems important for a more contextualized understanding of the impact of change rhythms on organizational performance. Accordingly, heterogeneity in external environmental environments can be expected to influence the baseline relationships.

Thus, extending the internal change-stability perspective, we further develop the theoretical framework of organizational entrainment to examine the influence of external contingencies. Organizational entrainment, as defined by Pérez-Nordtvedt et al. (2008, p. 789), is "the processes by which organizations cope with temporal change by synchronizing (i.e., tempo matching and/or phase aligning) their endogenous cyclic activities to those of the external environment (i.e., the *zeitgeber*)." Thus, entrainment can be defined as a "form of organizational adaptation, which involves repetitive adjustments to ongoing, endogenous environmental cycles over a period of time" (Pérez-Nordtvedt et al., 2008, p. 789). The frequency, speed, and magnitude of these cycles may vary, as may their intervals, which may be regular or irregular (Ancona & Chong, 1996). In entrainment theory, the dominant cycle or pacer to which weaker cycles entrain is referred to as the *zeitgeber* (McGrath, Kelly, & Machatka, 1984). At the organizational level, zeitgebers are often established by influential actors such as governmental entities, industry governing bodies, or industry leaders, including a single dominant organization or a coalition of organizations (Pérez-Nordtvedt et al., 2008; Stevenson, 1985).

The theory posits two fundamental types of organizational entrainment: *phase* and *tempo*. Firstly, an organizational entrainment of *phase* would entail the alignment of specific organizational activity or activity cycles to the zeitgeber (Aschoff, 1979). Phase entrainment, therefore, refers to the stage in an activity cycle at which adjustment to a pacer occurs (Sandra

et al., 2023). Secondly, *tempo* concerns matching the speed of organizational activity cycles to that of the zeitgeber, although no assumption of phase is necessary (Ancona & Chong, 1996; Oatley & Goodwin, 1971). Accordingly, tempo (or pace) entrainment pertains to the rate at which the activity aligns with the pacer (Sandra et al., 2023). Other research delineates these types of entrainment as "reaction speed" and "implementation speed," respectively (Schmitt & Klarner, 2015).

Following this theory, organizational change can be defined as a definitive alteration in response to external stimuli, such as environmental disruptions or discontinuities (Ancona & Chong, 1996). In line with previous considerations, entrainment represents a mechanism through which organizations may cope with change (e.g., Ancona & Chong, 1996; Fraisse, 1963). It serves as a means to overcome environmental misfits and to align with zeitgeber's phase and tempo (Pérez-Nordtvedt et al., 2008). In the absence of environmental or internal system changes, entrainment is not required (Sandra et al., 2023). However, changes in the environment, e.g., due to jolts or innovations, which typically bring significant structural changes, create disruptions in the expected flows and operations of the organization, potentially leading to a misalignment with the rhythms of the environment (Pérez-Nordtvedt et al., 2008). Such misalignment has been associated with adverse effects on a firm's performance (Burton, Lauridsen, & Obel, 2002; Burton, Lauridsen, & Obel, 2003).

In line with entrainment theory, prior research has indicated that the extent and frequency of change within an industry can vary considerably (e.g., Nadkarni, Chen, & Chen, 2016; Zhang et al., 2023). For example, Reed (2022) demonstrates that the frequency and magnitude of strategic changes are contingent upon the level of turbulence within an industry. The study posits that elevated turbulence levels prompt more frequent and potentially more substantial strategic changes as firms adjust to rapidly evolving circumstances. We, therefore, examine how temporal environmental factors moderate synchronization processes in organizations. Building upon previous research on industrial influence in strategic change, we

incorporate industry dynamism (e.g., Boyd, 1990; Dess & Beard, 1984) and industry clockspeed (e.g., Nadkarni & Narayanan, 2007) as moderating factors.

Industry dynamism

Industry dynamism is the turbulence or instability level facing an environment. Thus, it is characterized by turnover, absence of pattern, and unpredictability, heightening uncertainty for organizational decision-makers (Dess & Beard, 1984). Industry dynamism differs among industries due to various factors, including market growth, technological innovation, and environmental complexity (e.g., Boyd, 1990; Dess & Beard, 1984; Keats & Hitt, 1988; Klarner & Raisch, 2013).

Environments characterized by high dynamism, rapid change, and uncertainty significantly moderate the relationship between strategic change and firm performance (Zhang et al., 2023). In the absence of a clear pattern, high dynamism requires firms to adopt a frequent and agile approach to remain competitive, responding expeditiously to technological advances, market trends, and competitive actions (e.g., Barry, Kemerer, & Slaughter, 2006). As a result, the unpredictable rhythm of change presents a significant challenge for firms seeking to align themselves with the environment, potentially leading to an “out of phase” misfit. As previously outlined, within the context of entrainment theory, the term 'phase' is used to describe the alignment with external industry contexts, which occur when changes take place (Pérez-Nordtvedt et al., 2008; Sandra et al., 2023). To address this challenge, firms that are out of phase have to entrain by aligning their activities with the new temporal environment (Pérez-Nordtvedt et al., 2008).

The capacity for irregular changes enables firms to act flexibly, thereby facilitating an increased recovery from misalignment or misfit. Consequently, this adaptability frequently yields superior performance, permitting firms to respond expeditiously to unanticipated changes and restore equilibrium efficiently. Conversely, maintaining a regular rhythm can prove challenging when unexpected deviations occur. In such instances, the larger the

discrepancy between the desired and actual rhythm, the more complex and costly it becomes to realign and retrace to the environmental pace (Pérez-Nordtvedt et al., 2008). This rigidity can impede performance, particularly in dynamic environments where flexibility is essential for effectively managing changes. Therefore, in light of the absence of patterns and low predictability, it becomes evident that frequent and agile strategic changes are a necessity in highly dynamic industries. The flexibility that enables firms to employ irregular change approaches allows for quicker recovery, even in the face of disruptions, ultimately contributing to maintaining competitive advantages and higher long-term firm performance.

In contrast, in environments characterized by low dynamism, changes are typically more predictable and more manageable to plan for. This predictability mitigates the risk of misfits, as changes are less frequent and more manageable. Consequently, firms can sustain a consistent performance level by integrating strategic initiatives gradually, obviating the necessity for constant adjustments. Thus, when changes are regular, the risk of misfits remains low, allowing firms to concentrate on internal processes to implement changes rather than continuous external alignment (e.g., Shi & Prescott, 2012). This internal focus frequently results in superior performance (e.g., Klarner & Raisch, 2013), enabling a more stable and controlled environment for growth and improvement.

In contrast, irregular changes disrupt the regularity of rhythms, thereby increasing the likelihood of misfits. These misfits can result in underperformance, as the lack of predictability and consistency in changes makes it challenging to maintain alignment and stability. In such scenarios, the inability to quickly adapt can hinder overall performance. Therefore, we conclude.

> ***Hypothesis 2a (H2a):*** *Industry dynamism moderates the relationship between strategic change rhythms and long-term firm performance so that the relationship between regular change and long-term firm performance is weaker in high-dynamic industries and stronger in low-dynamic industries*

Industry clockspeed

Industry clockspeed captures the rate of industry change driven by endogenous factors (e.g., technological and competitive) (Fine, 1998). Accordingly, industry clockspeed reflects "industry-level changes based on the aggregate actions initiated by all the incumbent firms in the industry" (Nadkarni & Narayanan, 2007, p. 245) and is differentiated between slow and fast industry clockspeed.

Industries with fast clockspeed are characterized by rapid changes in strategic actions and organizational structures. To maintain competitive advantages, frequent changes are essential (Nadkarni & Narayanan, 2007). However, this high pace of change presents a significant challenge for firms seeking to align themselves with the environment, potentially leading to a "tempo misfit." As previously defined, tempo entrainment refers to the rate at which an activity aligns with the pacer (Sandra et al., 2023). A tempo misfit can manifest in two ways: out-of-sync firms may either act as temporal leaders (e.g., moving too fast) or lag (e.g., moving too slowly). To entrain, firms must accelerate or decelerate activities to align with the new temporal environment (Pérez-Nordtvedt et al., 2008).

Firms that maintain an irregular change rhythm demonstrate enhanced flexibility regarding changes. This enables them to resume the environmental tempo with greater speed and efficacy. Given that an out-of-sync misfit is associated with suboptimal performance outcomes (e.g., Burton et al., 2002; Burton et al., 2003), agility benefits their performance, as they are better equipped to respond to unanticipated changes.

This contrasts with the approach of firms that adhere to a regular change rhythm, which is inherently more inflexible. Such firms frequently encounter difficulties in resuming their regular rhythm after experiencing disruptions, which often results in a decline in performance. Furthermore, frequent changes can disrupt well-established processes, erode accumulated competitive advantages, and lead to inefficiencies, negatively impacting long-term firm performance (Klarner & Raisch, 2013). When combined with potential external misfit, this

internal issue can have a particularly detrimental effect on a regular change firm. Consequently, the capacity to react flexibly to market and environmental changes is critical to long-term performance.

In contrast, slow clockspeed industries are distinguished by their stable environments, allowing firms to cultivate and safeguard their core competencies over time, thereby attaining durable competitive advantages without the need for frequent strategic changes (Nadkarni & Narayanan, 2007). These industries benefit from gradual improvements and long-term investments in core competencies.

In slow-paced environments, regular changes are an effective way to ensure that firms remain aligned. The alignment to consistent and predictable environmental patterns allows firms to realize the benefits of balancing change and stability. (Kunisch et al., 2017). Accordingly, firms can facilitate organizational learning and cultivate stable yet flexible routines while minimizing information overload risks, resulting in superior performance (Klarner & Raisch, 2013).

In contrast, firms following irregular changes often result in difficulties maintaining a constant rhythm, which can cause them to become either temporal leaders or laggers. Such instabilities cause businesses to lose their temporal entrainment, negatively affecting their firm performance.

In light of the analysis mentioned above, it can be posited that the impact of strategic change rhythms on long-term firm performance is contingent upon industry clockspeed. In industries where the pace of change is slow, the implementation of regular changes is imperative for the maintenance of competitiveness and the achievement of long-term performance. Conversely, in industries where the pace of change is high, it is more advantageous to maintain an irregular rhythm of change, as this allows firms to respond more effectively to instances of mis-sync.

Hypothesis 2b (H2b): *Industry clockspeed moderates the relationship between strategic change rhythms and long-term performance so that the relationship between regular change and long-term firm performance is weaker in fast-pacing industries and stronger in slow-pacing industries.*

METHOD

Sample and Data Collection

The sample is comprised of publicly traded United States firms that are included in the S&P 500 index. Including all firms that joined and left the S&P 500 between 2014 and 2023, the final sample comprised 621 firms. The S&P 500 index was selected to overview market-wide, industry-overarching effects comprehensively. Consequently, the range of firms included in this analysis spans from one to nine first-digit Standard Industrial Classification (SIC) codes. The first-digit SIC code zero was excluded from the analysis, as there was only one firm related to it. In accordance with the methodology proposed by Klarner and Raisch (2013), our study is focused on a 10-year period. However, we elected to focus on a more recent period, from 2014 to 2023. The primary database utilized for Study 1 was CapitalIQ. For Study 2, the annual reports of the identified firms were retrieved for the years between 2013 and 2020 from the U.S. Securities and Exchange Commission (SEC). However, due to missing data, the resulting sample size for Study 2 was 536.

Measurements

Independent variable

This study employs two distinct approaches to examine strategic change. The first is based on the "traditional" approach of measuring strategic change (Appendix 1), while the second is based on a novel approach.

Traditional approach (Study 1): First, we adopt the conceptualization of strategic changes at the corporate level as outlined by previous literature (e.g., Ginsberg, 1988). This definition encompasses the expansion and contraction of a firm's operational scope. Expansion

may be evidenced by the entry into a new business or country segment, whereas contraction may be evidenced by exits from such a segment (e.g., Klarner & Raisch, 2013).

Specifically, we built our first approach on the methodology of Klarner and Raisch (2013). The authors define strategic change in terms of changes in a firm's scope of operations and examine it along diversification-refocusing dimensions. A diversification event is defined as a firm's entry into a new country or business segment. In contrast, a refocusing event was defined as a firm's withdrawal from a country or business segment. Following prior approaches (e.g., Klarner & Raisch, 2013; Ndofor et al., 2013), this study categorizes strategic change in enlarging and reducing actions. Consequently, the category of enlarging includes firm events such as closed mergers and acquisitions, business expansions, and strategic alliances. In contrast, reductions encompass business restructurings, spin-offs, and discontinued operations/downsizings. The fundamental measurement of our independent variable *strategic change rhythm* varies regarding the different studies (Appendix 2). However, in contrast with the manual coding methodology employed by Klarner and Raisch (2013), this study uses a data retrieval process from CapitalIQ to identify sample-related change events.

We compiled a list of strategic changes and coded each change event with a value of 1. If no strategic change occurred during a given year, the variable was coded 0. Finally, we summed the value per year and firm. Following Klarner and Raisch's (2013) methodology, we transform the aforementioned strategic change measure into a dichotomous variable. This entailed coding each year as one if a firm implemented at least one strategic change and zero otherwise. Consequently, each firm was displayed as a 7-digit binary change-stability sequence, exemplified by 0001001, which indicates the sequences of change (1) and stability (0) periods.

We simplified Klarner and Raisch's (2013) description of change types and classified the 7-digit binary code into two different change types: *regular* and *irregular change*. The categories of change rhythms were defined as follows: 1) *Regular change* is defined as a category of firms whose change intervals are distributed relatively evenly over a certain period

(e.g., 1010101). 2) *Irregular change* is a category that encompasses firms whose conversion periods deviate from the patterns observed in the regular change category. To illustrate, this could be a rhythm defined by extended periods of change, punctuated by brief phases of stability (e.g., 1110111), or alternatively, a rhythm comprising long periods of stability, interspersed with brief alternation phases (e.g., 0000100). To ensure the reliability of the coding process, three independent coders were engaged to categorize the sequences in accordance with the specified change rhythm. The coders were provided with the definitions outlined by Klarner and Raisch as a reference point. Due to the absence of precise and detailed information, the mean intercoder reliability was determined to be 0.74, as measured by Cohen's kappa. This suggests a substantial agreement between the raters (Cohen, 1968).

To resolve disagreements, we applied a systematic approach. A seven-digit code was implemented to cluster the change rhythms based on the sequences, which included pertinent information on the rhythm. The seven-digit code is structured as follows: Sum of changes – max length of stability or changes – amount changes – amount stability – amount of changes in the first and second year – amount of changes in the third to fifth year – amount of changes in the sixth and seventh year. To illustrate, a sequence of 1010101 would automatically be translated into a code of 6-1-4-3-1-2-1, which highlights six change-stability switches and a fairly distributed change-stability (maximum length of phase: 1, phases of change: 4, phases of stability: 3, change in the first part of the sequence: 1, in the second: 2 and in the last: 1). This exemplifies a regular change rhythm. Conversely, we defined “regular change rhythm” as a high number of change stability switches (at least three), a low number of maximum lengths (at most two), and an even distribution of changes across the three sequence parts. Finally, the independent variable, strategic change rhythm, was coded as one if a firm exhibited a regular change and zero if a firm exhibited an irregular change.

Novel approach (Study 2): Second, we approach a novel, holistic view of strategic change. Our objective is to identify fundamental change by modifying the firm's self-

description. A change in a firm's self-description can serve as a significant indicator of strategic change within the firm. This is because it reflects a fundamental shift in how the firm perceives its identity and communicates its purpose internally and externally. When a firm changes its self-description, it signals a redefinition of its core values, mission, and vision, which are essential components of strategic orientation (e.g., Greiner & Bhambri, 1989). Such a transformation accompanies substantial adjustments in business activities, product offerings, resource allocations, and market strategies (e.g., Schepker et al., 2017). By updating its self-description, a firm not only realigns its internal operations and objectives but also reshapes its external image and stakeholder expectations (e.g., Kraatz & Zajac, 2001). Such a shift can facilitate the entry into new markets or business segments or, conversely, signify the exit from existing ones, aligning with the broader strategic goals of expansion or contraction. Consequently, monitoring changes in self-description provides a valuable lens through which to observe and understand the strategic evolution of a firm, making it a critical focus for researchers and practitioners in strategic management.

To assess the strategic change of firms following the concept of changing self-description, we employed unsupervised topic modeling. Building upon prior research, we also utilized text-based information to measure change (e.g., Behr & Fehre, 2019; McClelland, Liang, & Barker, 2010). By incorporating dynamic topic modeling (DTM), a method based on Latent Dirichlet Allocation (LDA), we were able to capture the development and change of topics over time. This approach identifies how specific themes evolve, decline, or emerge. Previous research employed comparable methods (e.g., Roese & Sikström, 2014).

The subsequent four steps are as follows: firstly, the annual reports (10-K) files of each firm in the sample were retrieved from Electronic Data Gathering, Analysis, and Retrieval System (EDGAR) from the SEC between 2013 and 2020.

Secondly, the section Item 1. Business was extracted (Appendix 3). This section contains an overview of the firm's business model, its main products or services, markets, and

competitive conditions (U.S. Securities and Exchange Commission, 2011). Changes in this area may indicate new business strategies, market expansions, or a reorientation of the firm.

Third, we applied the transformer model BERTopic to extract topics from each 10-K file (Appendix 4). BERTopic is a topic modeling technique that employs embeddings of Bidirectional Encoder Representations from Transformers (BERT), a pre-trained deep learning model, to create dense vector representations of text and employ clustering algorithms to identify coherent topics. It enhances traditional topic modeling by leveraging the semantic understanding of BERT and provides tools for dynamic, hierarchical topic analysis and interactive visualizations (Grootendorst, 2022).

As the last step, we calculated the Jensen-Shannon-Divergenz to measure the difference between the extracted topics during the time frame (Lin, 1991). As the model is based on statistical analysis, the results of the annual topic identification may vary from one iteration to the next. To mitigate the impact of outliers, we repeated the whole calculation 40 times for each firm and took the median value of the change. This approach led to annual change values from 2013-2014 to 2019-2020. It is erroneous to assume that every fragment of topical change implies strategic change. To recognize the importance of strategic change, we applied a relatively high benchmark and employed a value of the third quartile as a breakpoint to eliminate "noise." Topical change above the third quartile of a firm was coded as one and below zero. We also tested the firm median as a breakpoint for robustness and retrieved similar results. This approach resulted in a 7-digit binary change-stability sequence. With this information on changes per firm, we proceeded as in study one by categorizing the codes into change types.

Dependent variable

Long-term firm performance was measured as the industry-adjusted annual return on assets (ROA). We calculated ROA as net income divided by average assets, adjusting for industry effects by subtracting the average industry ROA at time t from the firm ROA at time

t. (e.g., Zhang & Rajagopalan, 2010). Median ROA was calculated along the first digit of the Standard Industrial Classification (SIC) code.

Finally, we evaluated firm performance three years after the conclusion of the change period. Given that our analysis encompasses strategic changes initiated between 2014 and 2020, the mean firm performance was evaluated as the average from 2021 to 2023.

Control variables

Several control variables were included. First, *firm age* was measured in years since the firm's founding. Second, we controlled for the *industry* along the firm's primary first-digit SIC codes instead. Third, we defined *yearly performance* as annual firm performance measures from 2014 to 2020. As in our dependent variable, we used ROA as the basis for measuring firm performance. Fourth, we controlled for *change in firm diversification*. We first calculated Palepus entropy measure of each firm's total diversification (Palepu, 1985) for each year from 2014 to 2020, measuring total diversification as the weighted average of all firm segments; the weight of each segment is the logarithm of the inverse of its share. Then, we computed yearly changes in diversification by dividing diversification in $t+1$ by diversification in t. Following Klarner and Raisch (2013), we then calculated the average change in firm diversification for the period 2014–2020 as the sum of all the yearly changes divided by six. Fifth, we controlled for *acquisitive change*. This variable was operationalized as the number of acquisitions made by a firm between 2014 and 2020, divided by the total number of strategic changes that occurred during this period. Sixth, a two-step process was employed to identify instances of *performance crises*. First, the industry-adjusted ROA change over two successive years was examined. According to Tushman and Rosenkopf (1996, p. 944), "a performance crisis occurs in year t when $r(t_0) < r(t_{-1}) < r(t_{-2})$", where $r(t_0)$ equals ROA at time t_0. Consequently, if the ROA exhibited a decline over the specified period, a dummy variable was assigned a value of 1 to signify the existence of a performance crisis. Secondly, a count variable was calculated to quantify the *frequency of performance crises* from 2014 to 2020.

Building on Klarner and Raisch's (2013) method, we included all of their control variables (e.g., firm size, number of change years, change magnitude, change median). However, while running the full model regression, we identified an issue with a high variance inflation factor (VIF). Variables exhibiting a high VIF are susceptible to multicollinearity. Consequently, a broadly acceptable threshold was selected, and a cutoff point of 10 was established (Hair et al., 2019). To remain below this benchmark, an iterative process was employed to test the VIF factor for each variable. This process was designed to determine the optimal combination, which included the highest number of K&Rs control variables. Additionally, we have attempted to address this issue by logarithmizing our variables, e.g., firm age. However, this approach proved ineffective. Consequently, the abovementioned approach led to the final selection of control variables.

Moderation variables

To assess temporal, industry-related effects, we calculated moderation variables such as *industry dynamism* and *clockspeed*.

Industry dynamism. Following previous literature (Keats & Hitt, 1988), we measured industry dynamism for 2020 stepwise. First, we acquired total sales for each industry for each year from 2020 to 2014 from CaptialIQ based on a two-digit SIC. Second, we employed a logarithmic transformation of the summed total industry sales and an index variable representing the number of years, with time serving as the independent variable. To capture the volatility of industry growth sales rates, the antilog of the standard error of the slope regression coefficient was utilized to measure industry dynamism. The unstandardized variable exhibits a range of 1.002 (minimum) to 1.101 (maximum), with a mean value of 1.023.

Industry clockspeed. To gauge industry clockspeed, we employed the measurement of organizational clockspeed proposed by Nadkarni and Narayanan (2007), which is defined as "the average time span between new corporate strategic actions." (Nadkarni & Narayanan, 2007, p. 251). This variable gauges the rate of change in corporate strategic actions and

structures by tracing 14 identified key strategic actions (such as mergers and acquisitions and organizational restructuring) through a news headline analysis over a fixed period.

In accordance with the aforementioned methodology, the industry clockspeed was determined by calculating the industry-wide mean number of changes occurring within a specified time frame. However, the present study did not focus on specific corporate actions based on news headlines. Instead, we calculated the industry clockspeed by examining the frequency of change between phases of stability and change for each firm in the sample over a seven-year period in accordance with the identified change rhythms. Subsequently, the data were median averaged based on a two-digit SIC. Consequently, the greater the number of industry clockspeed, the more frequently corporate actions occur within a given industry. The unstandardized variable exhibits a range of 0.75 (minimum) to 2.03 (maximum), with a mean value of 1.58.

Due to the high value of the variance inflation factor, both moderation variables were standardized using the z-score (Cohen, Cohen, West, & Aiken, 2013). To prevent a reduction in the sample size due to the presence of missing values, we followed previous research (e.g., Abernethy, Dekker, & Grafton, 2021; Wowak, Mannor, Arrfelt, & McNamara, 2016) and applied mean imputation for the control variables *firm age* ($N_{missing}$= 5) and *change in firm diversification* ($N_{missing}$ = 176) (Hair, Black, Babin, & Anderson, 2019). Testing the model without mean imputation resulted in a reduction of the sample size to N = 438. However, the model demonstrated robustness, as evidenced by an F-statistic of 18.13 ($p < .001$) and a strategic change rhythm of ß = -0.009 ($p < .05$). Furthermore, we dealt with outliers by winsorizing our dependent variable at the 1st and 99th percentile levels (e.g., Oehmichen, Schrapp, & Wolff, 2017). We calculated the OLS regression using the packages statsmodels and scipy with Python 3.8.11 (Seabold & Perktold, 2010; Virtanen et al., 2020). Appendix 5 provides a summary of our variables.

RESULTS

Empirical Study 1

Baseline: Rhythms of strategic change. Concerning Study 1, Table 2 summarizes the descriptive statistics and inter-correlations of the variables under consideration. Table 3 presents the results of the regression analysis conducted.

Insert Tables 2 and 3 about here.

The regression analysis yielded a significant negative result for the strategic change rhythm (Model 1b). This aligns with hypothesis 1b, which states that regular change is associated with a lower long-term firm performance than irregular change (H1b). Therefore, hypothesis 1b is supported, and hypothesis 1a is rejected.

Some tests were conducted to test the robustness of our models (Appendix 6). Firstly, the binary independent variable, strategic change rhythm, was extended and transformed into a categorical variable comprising three values: *regular change* (=1), *irregular change* (=2), and *no change* (=3). The designation "no change" signifies the absence of changes throughout the study period. Consequently, we were able to incorporate 12 additional firms that did not engage in any change during the observation period. The findings indicate that regular change is negatively significant, while no change is positively significant, albeit marginally. Irregular change is embedded in the intercept, which is significant and positive. Therefore, our results appear to be robust.

Secondly, the period under examination was marked by a series of challenging circumstances on the global stage. For example, the period between 2019 and 2023 was shaped by global crises, including the advent of the SARS-CoV-2 virus, which may have a negative impact on our long-term firm performance measures. Nevertheless, the objective was to ascertain the generability of the findings. As a result, the period under examination was modified from 2011 to 2020. Consequently, the rhythm of strategic change was examined over

a seven-year period from 2011 to 2017 and long-term firm performance from 2018 to 2020. Despite maintaining the remaining model variables constant, the initial findings could not be replicated. The sign of the independent variable remains negative, yet the result is not statistically significant (Appendix 7, Model 5d).

Thirdly, to align more closely with the measurement of strategic change proposed by Klarner and Raisch (2013), we conducted a replication analysis. In light of these considerations, our measure of strategic change was modified accordingly. The authors employed a diversification-refocusing dimension to quantify strategic change. Following the criteria established by Klarner and Raisch (2013), a diversification event is defined as a firm's entry into a new country or business segment. In contrast, a refocusing event is characterized by a firm's withdrawal from a country or business segment.

Consequently, we excluded the occurrence of strategic alliances and business restructuring as a strategic change event because both are not exclusively aligned with the previously mentioned definition (Appendix 2, Robustness A). In a second case, we excluded M&A activity as a strategic change event (Appendix 2, Robustness B). With the initial measurement, we were able to replicate our findings (Appendix 8, Model 6a-c). In the second measurement, while the direct baseline effect did not yield a significant result, our moderators demonstrated stability (Appendix 9, Model 7a-c). This finding further supports our argument that the consideration of external effects is relevant to dynamic strategic change.

Moderating effects. The subsequent analysis investigated the moderating effects of industry dynamism and clockspeed on the relationship. With regard to industry dynamism, the results indicate a negative and statistically significant impact ($ß_{mod}$ = -0.007, $p < .1$) on the relationships between strategic change rhythm and long-term firm performance. This suggests that the relationship between regular change and long-term performance is weaker in high-dynamic industries and stronger in low-dynamic industries. Comparable to H1b, the negative main effect of strategic change rhythm ($ß_{direct}$ = -0.012, $p < .01$) suggests that the relationship

between irregular change and long-term performance is stronger in high-dynamic and weaker in low-dynamic industries. Therefore, hypothesis 2a is supported. Overall, it can be stated that industry dynamism serves to reinforce the negative relationship between strategic change rhythm and long-term firm performance. Figure 2 substantiates our claims, indicating that in instances of high and low industry dynamism, firms undergoing irregular change tend to surpass those undergoing regular change.

Insert Figure 2 about here.

Concerning the moderating effect of industry clockspeed, the results indicate a negative and statistically significant impact on the relationship between strategic change rhythm and long-term firm performance ($ß_{mod}$ = -0.012, $p < 0.05$). This suggests that the relationship between regular change and long-term performance is weaker in fast-pacing and stronger in slow-pacing industries. Furthermore, the negative main effect of strategic change rhythm ($ß_{direct}$ = -0.011, $p < .05$) suggests that the relationship between irregular change and long-term performance is stronger in fast-pacing and weaker in slow-pacing industries. Consequently, hypothesis 2b is supported. However, the direct effect of strategic change rhythm is less pronounced than its moderating effect ($ß_{direct}$ = -0.011; $ß_{mod}$ = -0.012), resulting in the finding that in slow-paced industries, regular change is more pronounced than irregular change, while in fast-paced industries, irregular change is superior. Figure 3 illustrates the findings mentioned above.

Insert Figure 3 about here.

Empirical Study 2

A regression analysis was conducted based on the results of the text-based analysis and the topic-modeling approach (Study 2). Table 4 summarizes the descriptive statistics and inter-

correlations of the variables under consideration, while Table 5 provides the results of the regression analysis conducted.

Insert Tables 4 and 5 about here.

The results of this analysis (Model 3a, b and 4a, b) are consistent with those of the analysis conducted in Study 1. This analysis demonstrates a significant negative effect of strategic change rhythm. Additionally, analogous findings emerge for the moderation effects. Moreover, the adjusted R^2 value is in accordance with the result mentioned above. However, the sample size (N) differs from that of Study 1 due to the unavailability of 10-K files. The analysis was conducted using only complete records from the 10-K files.

DISCUSSION

This study aims to examine the dynamics of strategic change rhythms and their impact on long-term firm performance. In contrast to previous research, which frequently employed static methodologies to examine this relationship, this study employs a dynamic approach to advance the understanding of strategic change. Furthermore, the study investigates how aligning change rhythms with environmental characteristics, such as industry dynamism and clockspeed, moderates the relationship. Moreover, the study aims to provide new theoretical insights and refine understanding of strategic change rhythms by employing a novel methodological approach.

Contribution

The present study offers three sets of contributions. The initial contribution addresses the impact of rhythms of strategic change on long-term organizational performance. This is achieved by identifying rhythms of strategic change as a significant predictor of long-term organizational performance. In contrast to previous research, which has predominantly viewed strategic change as isolated and static occurrences, this study advances the conceptualization of strategic change as a series of interrelated events occurring over time. This dynamic perspective

facilitates a more intricate comprehension of the influence of strategic change timing and frequency on organizational outcomes.

The study's findings indicate that irregular strategic changes, defined by varying intervals between changes, tend to outperform regular strategic changes, occurring at consistent intervals, in enhancing long-term firm performance. This insight challenges the traditional emphasis on regular, predictable change patterns (e.g., Klarner & Raisch, 2013). It suggests that flexibility and adaptability in the timing of strategic initiatives are key to sustaining competitive advantage. By extending the scope of analysis to encompass a diverse range of industries and periods and employing an extensive dataset from S&P 500 firms, the study offers compelling evidence supporting the superiority of irregular strategic change rhythms. By arguing on the external alignment of internal processes, our findings underscore the importance of aligning strategic changes with the specific needs and conditions of the firm and its environment.

Accordingly, the discrepancy in the findings may be attributed to differences in the study period. While Klarner and Raisch (2013) analyzed the years 1995 to 2004, our study encompasses the period from 2014 to 2023, which was marked by significant economic turbulence. This assumption is supported by examining the descriptive statistics, which reveal notable discrepancies. The performance crisis variable demonstrates considerable divergence, with a mean performance crisis score of 0.82 for Klarner and Raisch (2013) and a score of 1.40 for Study 1. Of particular note is the calculation time for long-term firm performance in our study, which encompasses the period of the global pandemic caused by the SARS-CoV-2 virus. In response, businesses adopt a "drive-by-sight" strategy, responding and adapting as necessary to the evolving conditions. Consequently, external circumstances may exert a more significant influence and are of greater consequence than the balance of a firm’s internal change process on long-term firm performance (e.g., Shi & Prescott, 2012).

The second set contributes to the understanding of how external temporal factors, such as industry dynamism and clockspeed, influence the relationship between strategic change

rhythms and long-term firm performance. The study demonstrates that the efficacy of strategic change rhythms varies considerably due to the dynamism and pacing of the industry environment.

Comparing external influence, we find that regular change is more advantageous in environments with low industry dynamism and slow industry clockspeed. Within these industries, change is less frequent and more predictable, thus enabling firms to maintain a thriving, balanced change-stability relationship. In contrast, irregular changes are more advantageous in high industry dynamism and fast industry clockspeed. These industries are characterized by a lack of predictable patterns, heightening uncertainty, and a high pace of activity. The flexibility inherent to the irregular change type allows firms to realign themselves from potential misalignment situations in an efficient manner. By underscoring the significance of contemplating environmental temporal elements, this study offers invaluable insights into how firms can optimize their strategic change rhythms to enhance performance. It emphasizes the necessity of a contextualized approach to strategic management, wherein the timing and frequency of changes are aligned with the specific demands and characteristics of the external environment.

Moreover, the robustness tests yielded no significant findings for the baseline. However, this is consistent with our contradictory argumentation of hypotheses 1a and 1b, reinforcing the notion that the relationship between irregular and regular change is not as straightforward as previously assumed. However, the moderating effects of the environment have remained stable (Appendix 7, Models 5b and 5c), albeit only at a weak level of significance ($p < 0.1$). Nevertheless, this illustrates the necessity for an expanded analytical approach to the rhythms in question, one that considers not only the internal change-stability processes but also the tensions between these processes and the external perspectives of the companies in question. While Study 1 found a significant negative effect, K&R found a positive effect, and our time-

adjusted robustness test (Appendix 7) showed a non-significant finding. However, the influence of the external environment is robust (Appendix 7 to 9).

The third set of contributions is dedicated to a novel measurement of strategic change based on a holistic perspective. Previously, the calculation of strategic change was predominantly based on quantitative metrics or qualitative approaches. In contrast, our approach calculates strategic change based on the change in the self-description of a firm (Study 2). We employed a topic-analyzing, text-based method to measure strategic change. This innovative method provides a more profound and intricate comprehension of strategic change by capturing shifts in a firm's identity and strategic orientation. By comparing the results of this analysis with those of Study 1, it can be demonstrated that this approach is empirically valid, offering a robust and insightful alternative to traditional methods.

Implications to Practice

The practical implications of this study underscore the necessity for firms to adopt context-specific strategies when managing strategic changes. Given the inconsistency of results across different industries and time contexts, it is evident that managers should tailor their strategic change plans to align with their unique environmental and industry conditions. A rigid, regular rhythm of strategic change may not always yield improved firm performance, suggesting that a more flexible approach could be beneficial. It is beneficial for companies to alternate between periods of intense change and stability. This allows them to align their strategies with their internal capabilities and external opportunities or threats.

Furthermore, firms must enhance their environmental scanning and monitoring tools. This enables them to predict necessary changes in strategic approaches. Firms can then stay responsive to industry-specific and temporal factors. Investing in adaptive capabilities, such as flexible organizational structures and advanced analytics, enables firms to respond swiftly to changes in the business environment. This maintains an effective balance between change and stability.

Limitation and Future Research

This study acknowledges its limitations, which provide a foundation for future research avenues. First, the study lacks a comparative analysis across different countries. The current research is confined to a single country, which may limit the generalizability of the findings. Future research should expand the sample to include multiple countries, thereby allowing for an examination of inter-country influences. Such comparative studies can assist in understanding the influence of institutional factors, such as regulatory frameworks, cultural differences, and economic environments, on the phenomena under study. By incorporating diverse national contexts, researchers can gain insights into how country-specific variables impact the outcomes, thereby enhancing the robustness and applicability of the findings on a global scale.

A second limitation pertains to this study's conceptualization and measurement of strategic change. The current research primarily analyzes 10-K annual reports, specifically "Part 1, Item 1. Business", which may not fully capture the breadth of corporate self-description. To obtain a more comprehensive understanding, future studies should expand the data foundation and include other types of corporate communication, such as earning calls, social media presence, and firm websites. Including this additional information will provide a broader perspective on how companies convey their strategic changes.

Furthermore, while this study only values the change of corporate topics based on 10-K reports, future research could take a deep-dive into the individual topic's content. This comprehensive approach could allow researchers to capture a more nuanced picture of strategic change.

Conclusions

The study provides new insights into how strategic change rhythms affect firm performance in various contexts. In particular, it emphasizes the importance of considering environmental-specific temporal factors.

FIGURES AND TABLES

FIGURE 1

Relationship between Rhythms of Strategic Change and Firm Performance

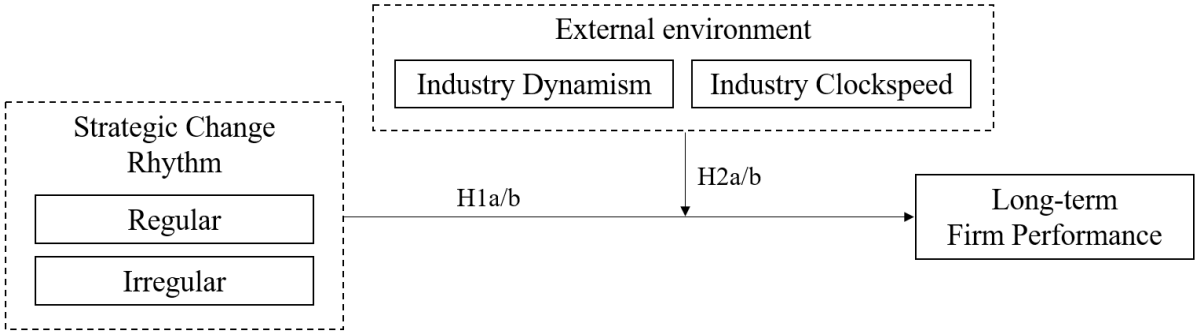


FIGURE 2

Moderation Effects of Industry Dynamism (Study 1)

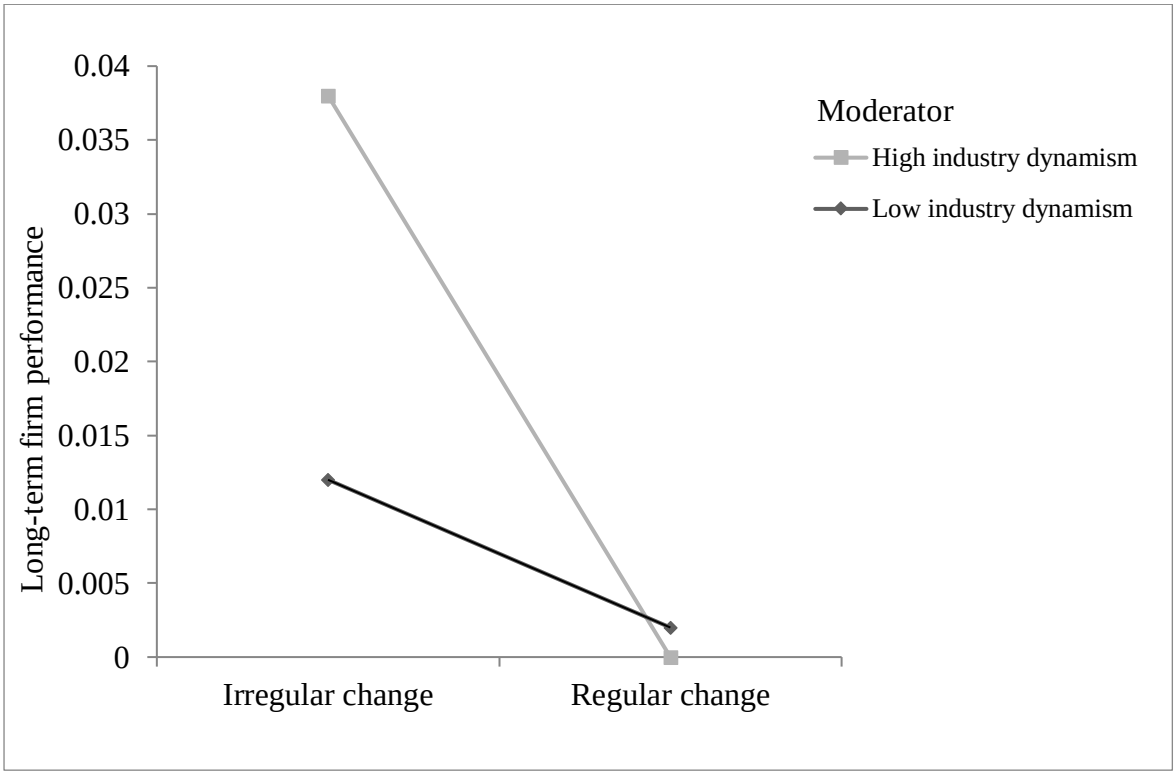


FIGURE 3

Moderation Effects of Industry Clockspeed (Study 1)

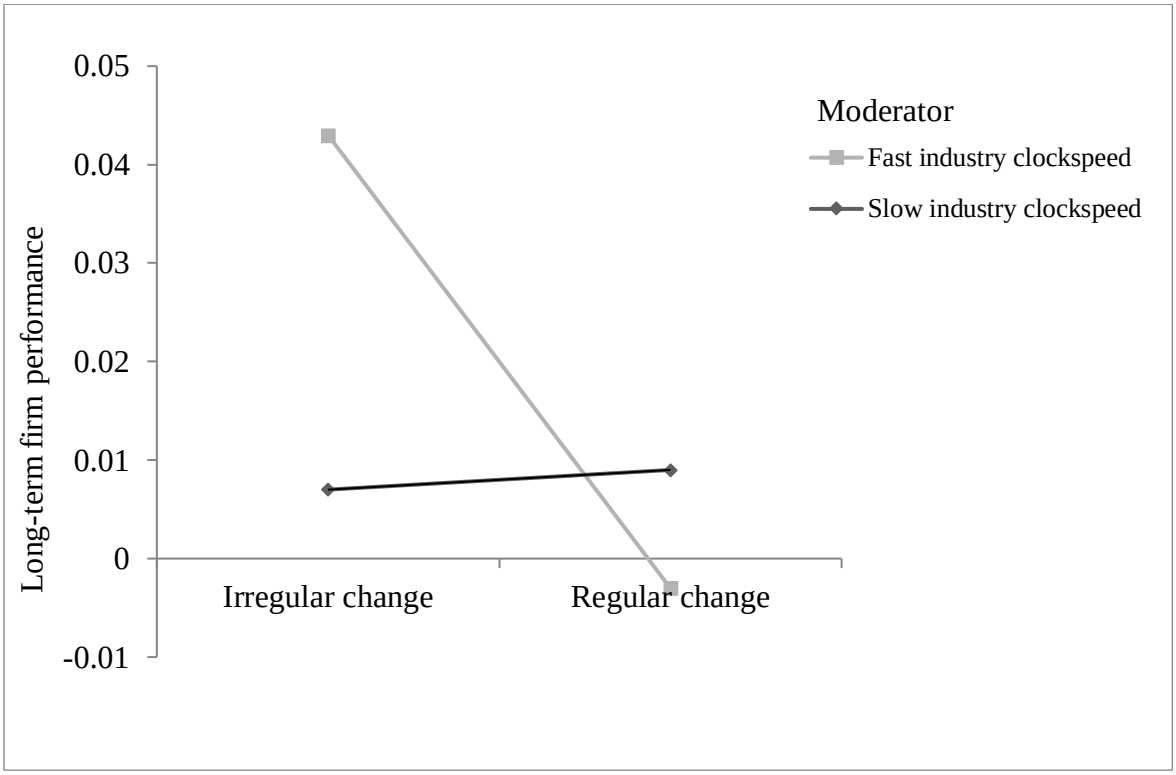


TABLE 1

Findings on Relationships between Strategic Change and Firm Performance

Autor	Study period	Country	Industry	Research Design	Strategic Change	Performance	Effect
Abernethy and Brownell (1999)	1994	Australia	Hospital	Cross-sectional	Survey, change in strategy types (Miles & Snow)	Financial & non-financial	Negative, but ns
Asemokha et al. (2019)	2014	Finland	Multiple	Cross-sectional	Survey, change in business model	Survey, financial	Positive
Batra (2016)	NA	India	manufacturing and service industry	Cross-sectional	Resource allocation	Survey, financial & non-financial	Negative (positive regarding strategic persistence)
Goll et al. (2007)	1972-1995	USA	Aviation	Longitudinal & cross-sectional	Change in hub concentration	Accounting based	Positive
Goll and Rasheed (2011)	1974-1986 / 1997-2008	USA	Aviation	Cross-sectional	Survey, change in strategy types	Accounting based	Positive
Klammer et al. (2017)	NA	Germany, Austria, Switzerland	No focus	Cross-sectional	Survey, change in strategic planning and renewal	Survey, financial & non-financial	Positive
Klarner and Raisch (2013)	1995-2004	EU	Insurance	Longitudinal	Change in corporate diversification-refocusing dimension	Accounting based	Positive for long-term performance
Klink (2016)	1990-2013	USA	Multiple	Longitudinal	Change in capital expenditures	Accounting based	Negative for short-term performance
Leitner and Güldenberg (2010)	1995-2003	Austria	Multiple	Longitudinal	Survey, change in strategy types	Financial	Negative, but ns
Li and Chen (2019)	2004-2015	China	Multiple	Cross-sectional	Resource allocation (Finkelstein & Hambrick)	Accounting based	Positive
Mohammad (2019)	NA	Nigeria	Banking	Cross-sectional	Survey	Survey	Positive
Naranjo-Gil et al. (2008)	NA	Spain	Hospital	Cross-sectional	Survey, change in strategy types (Miles & Snow)	Non-financial	Negative
Naranjo-Gil (2015)	2002-2008	Spain	Hospital	Cross-sectional	Resource allocation	Non-financial	Mixed: positive for long-term, negative for short-term performance

Autor	Study period	Country	Industry	Research Design	Strategic Change	Performance	Effect
Ndofor et al. (2013)	1990-1996	USA	Software	Cross-sectional	Resource allocation along strategic actions and retrenchment	Accounting based	Mixed
Schepker et al. (2017)	1972-2013	multiple	Multiple	Meta-analysis	Multiple	Accounting & market based	Negative for long-term, ns for short-term performance
Sewaid et al. (2022)	2009-2016	NA	Multiple	Cross-sectional	Category switch	Financial & non-financial	Positive
Smith and Grimm (1987)	NA	USA	Railroad	Cross-sectional	Survey	Accounting based	Positive
Suprapto (2019)	NA	Indonesia	Telecommunica	Cross-sectional	Survey	Survey, market based	Positive
Wafirotin (2020)	NA	Indonesia	Telecommunica	Cross-sectional	Survey	Survey	Positive
Wei et al. (2014)	1999	China	No focus	Cross-sectional	Survey, product strategy change	Accounting & market based	Positive
Wei and Zhang (2020)	NA	China	No focus	Cross-sectional	Survey, causation strategic change or effectuation strategic change	Accounting & market based	Positive
Wu et al. (2019)	2003-2015	China	No focus	Longitudinal	Change in corporate diversification-refocusing dimension	Accounting based	Positive
Wu (2021)	2008-2018	China	No focus	Meta-analysis	Multiple	Multiple	Positive
Yi et al. (2015)	NA	China	No focus	Cross-sectional	Survey	Survey, financial	Inverted U-shaped relationship between the speed of strategic change and performance
Zajac and Kraatz (1993)	1971-1986	USA	Education	Cross-sectional	Change of portfolio	Financial & non-financial	Positive
Zhang and Rajagopalan (2010)	1993-1998	USA	No focus	Cross-sectional	Resource allocation	Accounting based	Inverted U-shaped
Zhao et al. (2020)	2003-2013	China	No focus	Cross-sectional	Resource allocation	Accounting based	Negative
Zhou et al. (2021)	2017	China	High-tech	Cross-sectional	Survey, change in speed and scope	Survey	Positive for change speed, negative for change scope

Notes. ns = not significant.

TABLE 2

Descriptive Statistics (Study 1)

Variable	Mean	Std	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Long-term firm performance 2021-2023	0.01	0.06	-0.09	0.13	1														
2. Strategic change rhythm	0.19	0.39	0	1	-0.07	1													
4. Change diversification	1.04	0.64	-5.34	14.14	-0.01	0.00	1												
5. Acquisition change	0.28	0.28	0	1	0.06	0.10	-0.01	1											
6. Firm performance in 2014	0.00	0.08	-0.96	0.44	0.28	-0.04	-0.03	0.02	1										
7. Firm performance in 2015	0.00	0.08	-0.47	0.51	0.25	0.00	-0.02	-0.05	0.64	1									
8. Firm performance in 2016	0.01	0.08	-0.47	0.41	0.39	0.01	-0.04	0.02	0.51	0.71	1								
9. Firm performance in 2017	0.00	0.07	-0.34	0.32	0.46	-0.04	-0.03	0.01	0.41	0.45	0.62	1							
10. Firm performance in 2018	0.01	0.08	-0.39	0.44	0.56	0.02	-0.02	-0.01	0.25	0.34	0.48	0.56	1						
11. Firm performance in 2019	0.01	0.09	-0.44	0.94	0.42	0.05	-0.03	0.02	0.24	0.27	0.34	0.38	0.44	1					
12. Firm performance in 2020	0.00	0.10	-0.76	0.43	0.45	0.02	-0.03	0.03	0.19	0.39	0.45	0.37	0.42	0.41	1				
13. Performance crises	1.40	1.14	0	6	-0.18	-0.04	-0.02	-0.05	0.07	0.07	-0.06	-0.10	-0.14	-0.19	-0.23	1			
14. Firm age	78.61	50.47	6	246	-0.19	-0.08	0.03	-0.12	-0.08	-0.06	-0.05	-0.09	-0.14	-0.17	-0.07	0.02	1		
15. Industry dynamism*	0.02	1.01	-1.13	4.42	-0.05	0.00	0.01	0.02	-0.11	-0.17	-0.12	-0.08	-0.10	-0.04	-0.36	-0.02	-0.03	1	
16. Industry clockspeed*	0.00	1.02	-3.75	1.98	-0.02	0.07	0.04	0.08	-0.06	-0.11	-0.09	-0.08	-0.11	0.03	-0.09	-0.06	0.04	0.46	1
17. SIC	4.22	1.96	1	9	0.03	0.02	0.05	0.09	0.08	0.10	0.12	0.12	0.09	0.01	0.06	0.03	-0.16	-0.33	-0.37

Notes. Pearson's correlation matrix; N = 609; Mean = mean effect size; SD = standard deviation; Min = Minimal value; Max = maximum value; Correlations with an absolute value greater than 0.09 are considered significant.

*Moderators are standardized.

TABLE 3

Regression results (Study 1)

Variables	DV: Long-term firm performance 2021-2023 Model 1a	Model 1b	Model 2a Industry dynamism	Model 2b Industry clockspeed
Intercept	0.020 (0.01) [0.021]	0.022 (0.01) [0.009]	0.013 (0.01) [0.201]	0.014 (0.01) [0.027]
Controls:				
Firm age	0.000 (0.00) [0.006]	0.000 (0.00) [0.003]	0.000 (0.00) [0.004]	0.000 (0.00) [0.002]
Change diversification	0.002 (0.00) [0.473]	0.002 (0.00) [0.469]	0.002 (0.00) [0.412]	0.002 (0.00) [0.487]
Acquisitive change	0.005 (0.01) [0.463]	0.006 (0.01) [0.332]	0.006 (0.01) [0.327]	0.007 (0.01) [0.256]
Firm performance 2014	0.113 (0.03) [0.000]	0.109 (0.03) [0.000]	0.110 (0.03) [0.000]	0.104 (0.03) [0.000]
Firm performance 2015	-0.122 (0.03) [0.000]	-0.120 (0.03) [0.000]	-0.121 (0.03) [0.000]	-0.119 (0.03) [0.000]
Firm performance 2016	0.054 (0.04) [0.148]	0.058 (0.04) [0.124]	0.059 (0.04) [0.113]	0.063 (0.04) [0.094]
Firm performance 2017	0.097 (0.03) [0.005]	0.090 (0.03) [0.009]	0.087 (0.03) [0.012]	0.088 (0.03) [0.011]
Firm performance 2018	0.238 (0.03) [0.000]	0.240 (0.03) [0.000]	0.234 (0.03) [0.000]	0.238 (0.03) [0.000]
Firm performance 2019	0.065 (0.02) [0.006]	0.068 (0.02) [0.004]	0.065 (0.02) [0.005]	0.071 (0.02) [0.002]
Firm performance 2020	0.118 (0.02) [0.000]	0.118 (0.02) [0.000]	0.136 (0.02) [0.000]	0.118 (0.02) [0.000]
Performance crises	-0.002 (0.00) [0.195]	-0.002 (0.00) [0.174]	-0.002 (0.00) [0.197]	-0.002 (0.00) [0.159]
Hypotheses:				
Strategic change rhythm (H1)		-0.012 (0.00) [0.005]	-0.012 (0.00) [0.005]	-0.011 (0.00) [0.012]
Industry dynamism			0.006 (0.00) [0.024]	
Mod: Strategic change rhythm (H2a)			-0.007 (0.00) [0.088]	
Industry clockspeed				0.006 (0.00) [0.018]
Mod: Strategic change rhythm (H2b)				-0.012 (0.01) [0.023]
R2	0.44	0.45	0.45	0.45
R2-adjusted	0.42	0.43	0.43	0.43
F-statistic	24.37 [0.000]	23.84 [0.000]	22.108 [0.00]	23.110 [0.00]
AIC	-2,116.38	-2,122.71	-2,125.13	-2,126.06
BIC	-2,028.14	-2,030.06	-2,023.66	-2,029.00

Notes. OLS regression analysis. N = 609. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported.

TABLE 4

Descriptive Statistics (Study 2)

Variable	Mean	Std	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Long-term firm performance 2021-2023	0.01	0.06	-0.09	0.15	1													
2. Strategic change rhythm	0.05	0.22	0	1	-0.10	1												
3. Change diversification	1.00	0.32	-5.34	3.65	0.05	0.00	1											
4. Firm performance in 2014	0.01	0.08	-0.96	0.44	0.29	-0.03	-0.02	1										
5. Firm performance in 2015	0.01	0.09	-0.47	0.51	0.25	-0.01	-0.04	0.67	1									
6. Firm performance in 2016	0.01	0.08	-0.47	0.41	0.39	-0.02	-0.03	0.53	0.72	1								
7. Firm performance in 2017	0.01	0.07	-0.34	0.30	0.51	-0.03	0.00	0.41	0.47	0.63	1							
8. Firm performance in 2018	0.01	0.07	-0.39	0.44	0.57	-0.06	-0.02	0.25	0.32	0.47	0.61	1						
9. Firm performance in 2019	0.01	0.08	-0.44	0.52	0.53	-0.06	-0.01	0.31	0.31	0.38	0.47	0.50	1					
10. Firm performance in 2020	0.01	0.10	-0.76	0.43	0.47	-0.01	-0.01	0.22	0.39	0.47	0.41	0.44	0.49	1				
11. Performance crises	1.38	1.15	0	6	-0.22	0.05	-0.02	0.08	0.08	-0.06	-0.12	-0.16	-0.24	-0.25	1			
12. Firm age	78.59	49.77	8	246	-0.19	-0.01	-0.02	-0.08	-0.07	-0.06	-0.09	-0.14	-0.19	-0.09	0.04	1		
13. Industry dynamism*	0.01	1.02	-1.17	3.04	-0.04	0.03	0.06	-0.08	-0.16	-0.11	-0.14	-0.10	0.04	-0.08	-0.07	0.00	1	
14. Industry clockspeed*	0.00	1.03	-3.75	1.98	-0.02	0.00	0.10	-0.06	-0.10	-0.10	-0.08	-0.10	0.03	-0.07	-0.07	0.03	0.69	1
15. SIC	4.17	1.95	1	9	0.04	0.04	-0.02	0.09	0.12	0.13	0.13	0.08	0.01	0.07	0.03	-0.14	-0.63	-0.38

Notes. Pearson's correlation matrix; N = 536; Mean = mean effect size; SD = standard deviation; Min = Minimal value; Max = maximum value; Correlations with an absolute value greater than 0.09 are considered significant.

*Moderators are standardized.

TABLE 5

Regression results (Study 2)

Variables	DV: Long-term firm performance 2021-2023			
	Model 3a	Model 3b	Model 4a Industry dynamism	Model 4b Industry clockspeed
Intercept	0.014 (0.01) [0.190]	0.016 (0.01) [0.135]	0.007 (0.01) [0.370]	0.008 (0.01) [0.361]
Controls:				
Firm age	0.000 (0.00) [0.007]	0.000 (0.00) [0.006]	0.000 (0.00) [0.008]	0.000 (0.00) [0.007]
Change diversification	0.009 (0.01) [0.147]	0.009 (0.01) [0.146]	0.009 (0.01) [0.146]	0.009 (0.01) [0.153]
Firm performance 2014	0.123 (0.03) [0.000]	0.121 (0.03) [0.000]	0.114 (0.03) [0.000]	0.118 (0.03) [0.000]
Firm performance 2015	-0.120 (0.04) [0.001]	-0.119 (0.04) [0.001]	-0.107 (0.04) [0.003]	-0.111 (0.04) [0.002]
Firm performance 2016	0.014 (0.04) [0.734]	0.013 (0.04) [0.753]	0.009 (0.04) [0.823]	0.011 (0.04) [0.795]
Firm performance 2017	0.161 (0.04) [0.000]	0.163 (0.04) [0.000]	0.166 (0.04) [0.000]	0.164 (0.04) [0.000]
Firm performance 2018	0.216 (0.03) [0.000]	0.213 (0.03) [0.000]	0.213 (0.03) [0.000]	0.216 (0.03) [0.000]
Firm performance 2019	0.072 (0.03) [0.004]	0.070 (0.03) [0.006]	0.063 (0.03) [0.012]	0.066 (0.03) [0.009]
Firm performance 2020	0.128 (0.02) [0.000]	0.129 (0.02) [0.000]	0.133 (0.02) [0.000]	0.131 (0.02) [0.000]
Performance crises	-0.003 (0.00) [0.125]	-0.003 (0.00) [0.152]	-0.002 (0.00) [0.202]	-0.002 (0.00) [0.217]
Hypotheses:				
Strategic change rhythm (H1)		-0.018 (0.01) [0.049]	-0.015 (0.01) [0.082]	-0.018 (0.01) [0.044]
Industry dynamism			0.005 (0.00) [0.047]	
Mod: Strategic change rhythm (H2a)			-0.019 (0.01) [0.004]	
Industry clockspeed				0.006 (0.00) [0.038]
Mod: Strategic change rhythm (H2b)				-0.018 (0.01) [0.007]
R2	0.45	0.46	0.47	0.47
R2-adjusted	0.43	0.44	0.45	0.44
F-statistic	23.84 [0.000]	22.92 [0.000]	22.513 [0.00]	22.416 [0.00]
AIC	-1,813.17	-1,815.20	-1,821.96	-1,820.88
BIC	-1,731.77	-1,729.52	-1,732.00	-1,730.91

Notes. OLS regression analysis. N = 536. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported.

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APPENDIX

APPENDIX 1

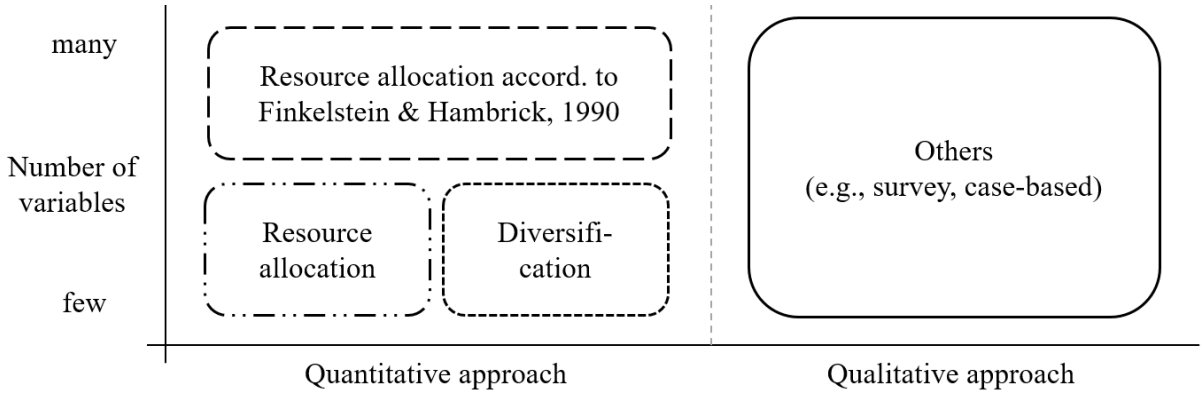
Conceptualization of Strategic Change

As displayed, the understanding of strategic change is quite broad. A variety of terms are used interchangeably to describe strategic change, including strategic transformation, strategic renewal, strategic variation, strategic deviation, corporate refocusing, organizational change, strategic experimentation, strategic adjustment, and strategic flexibility (Carpenter, 2000b; Huff, Huff, & Thomas, 1992; Müller & Kunisch, 2018; Nicholls-Nixon, Cooper, & Woo, 2000; Pathak, Hoskisson, & Johnson, 2014; Snow & Hambrick, 1980). A synthesis of prior research indicates that strategic change is a significant corporate transformation process. This process can originate from within a firm or as a response to the external environment and competitive conditions (e.g., Fombrun & Ginsberg, 1990; Zajac & Kraatz, 1993). Furthermore, strategic change involves a shift in a firm's business activities, product scope, resource deployments, goals, or strategic orientation (e.g., Klammer et al., 2017; Müller & Kunisch, 2018; Rajagopalan & Spreitzer, 1997). Consequently, strategic change can occur at various levels within a firm and in a comprehensive manner, encompassing the entire firm.

Diverse methods: Given the multitude of approaches to defining strategic change, it is understandable that the operationalization and measurement of strategic change in research also exhibit some differences. However, in contrast to strategic change's diverse perspectives and research directions, its measurement is constrained to a few methods.

FIGURE

Overview of Measurement Methods of Strategic Change in Management Research



Strategic management research has two distinct methodologies for identifying strategic change: quantitative and qualitative. Additionally, the quantitative approach can be further classified based on the number of variables included in the analysis.

Quantitative approach: One dominant approach is the resource allocation approach proposed by Finkelstein and Hambrick (1990). Following Mintzberg's (1978) conceptualization of strategy as a pattern of resource allocation, the authors developed the Strategic Resource Allocation Profile (SRAP). This approach operationalizes strategic change by measuring the variance of resources over a period of time, typically one year, and includes six individual indicators. These indicators are intended to depict a comprehensive picture of the firm's underlying strategic decision-making pattern under consideration.

Following this logic, several studies have used and even updated the SRAP approach, e.g., "strategic persistence and conformity" (Finkelstein & Hambrick, 1990; Geletkanycz & Hambrick, 1997), "strategic variation and deviation" (Haynes & Hillman, 2010), "strategic dynamism" (Chatterjee & Hambrick, 2007) or "strategic change" (Kipkirong Tarus & Aime, 2014; Zhang & Rajagopalan, 2010). Carpenter (2000a) expanded the approach by arguing that international activities are increasingly understood as an integral part of strategy (Sanders & Carpenter, 1998). Consequently, he added "international commitment" to the index. Furthermore, with the variables "strategic variation" and "strategic deviation," Carpenter

displays two different approaches to measuring strategic change. While "strategic variation" indicates the degree to which a firm's strategy varies over time, "strategic deviation" captures the extent to which the strategy deviates from key trends in the primary industry (Carpenter, 2000a). Next to SRAP, there are resource allocation approaches based on fewer variables (e.g., Quigley & Hambrick, 2012; Tang & Crossan, 2017).

Another critical approach is the measurement of strategic change in terms of diversification. This approach is characterized by the change in entropy index according to Jacquemin and Berry (1979). This approach measures the extent of diversification in a firm's activities and the related and unrelated elements of diversification (Palepu, 1985). Another classification is the separation of product-market and geographic diversification (Westphal & Bednar, 2005; Westphal & Fredrickson, 2001). Therefore, strategic change is defined as an absolute change in the degree of diversification of the firm (Wiersema & Bantel, 1992). Consequently, the measurement considers each business area's diversity and relative strength, and the change between two points in time represents the extent of strategic change (Boeker, 1997; Wiersema & Bantel, 1992).

Qualitative approach: Finally, there are qualitative approaches, where the number of examined variables can vary significantly. Some studies use strategic change as a dichotomous variable, usually in conjunction with strategy types (Boeker, 1997; Klarner & Raisch, 2013; Smith & Grimm, 1987; Zajac & Shortell, 1989). Consequently, strategic change measures only whether a specific strategy type (e.g., cost leadership or categories of Miles, Snow, Meyer, & Coleman, 1978) changes over time, without consideration of its extent. In other instances, the measurement of strategic change employs a multi-method approach, including questionnaire surveys and expert panels (e.g., Herrmann & Nadkarni, 2014; Waldman, Javidan, & Varella, 2004).

APPENDIX 2

Measurement of Strategic Change

The following table presents the components of the respective strategic change measures.

Study	Strategic change based on
1	Change events like closed mergers and acquisitions, business expansions, strategic alliances, business restructurings, split-offs, discontinued operations/downsizings
1 (Robustness A)	Change events like closed mergers and acquisitions, business expansions, split-offs, discontinued operations/downsizings
1 (Robustness B)	Change events like business expansions, split-offs, discontinued operations/downsizings
2	Topical change of 10-K reports

APPENDIX 3

Selection of Data Sources for Study 2

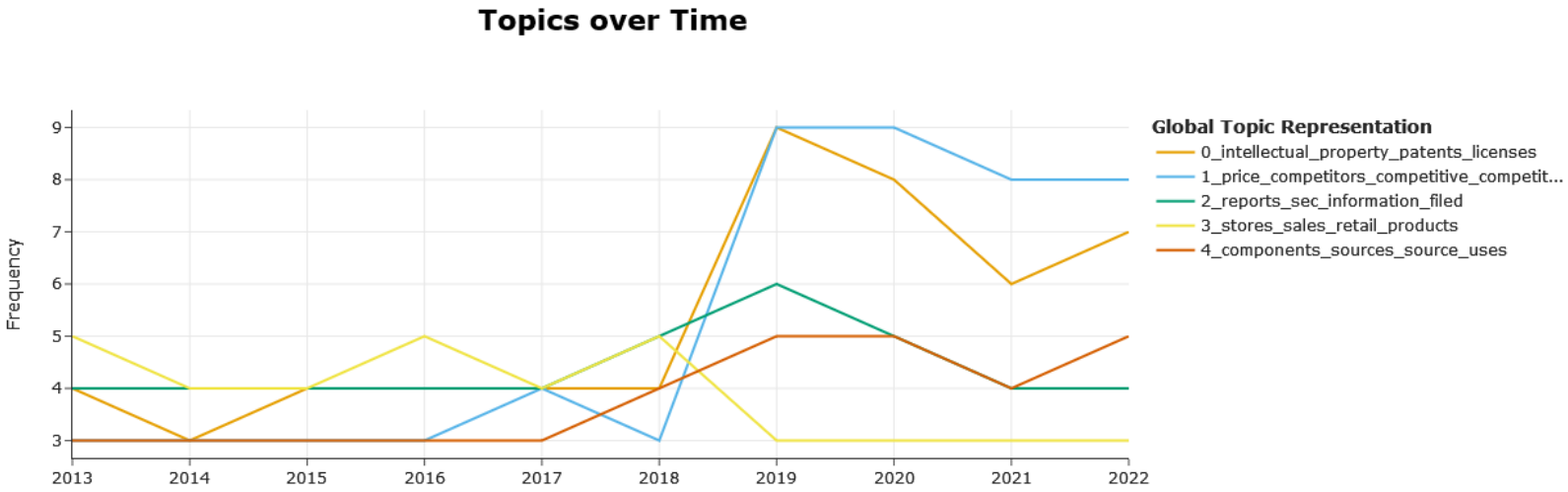
The following table presents a range of potential data sources that were considered for analysis of strategic changes and their impact on long-term corporate performance in Study 2. Its purpose is to provide an overview of these sources.

Source	Content	Potential Method
Letter to shareholders	No exclusive firm self-description, but an explanation of financial statements and outlook (e.g., Point, 2010)	Dictionary Approach (e.g., Jiang, Wang, Chu, & Zheng, 2020; McClelland et al., 2010)
10-K Item 1. Business	Exclusive company self-description (e.g., U.S. Securities and Exchange Commission, 2011)	Latent Semantic Analysis (LSA, e.g., Roese & Sikström, 2014). Topic Modeling is based on LSA
10-K Item 1A. Risk Factors	Part of a firm's self-description but focus on outlook regarding risks (e.g., U.S. Securities and Exchange Commission, 2011)	Dictionary Approach
Earning Calls	No exclusive company self-description, but an explanation of financial statements and outlook	Dictionary Approach

APPENDIX 4

Application of BERTopic

The computation was performed using a Python script, following the classical input-processing-output principle. To identify pertinent topics, the BERTopic model was trained using the previously extracted text data "Item 1. Business" from the 10-K files. As an illustration, the figure below depicts the topics extracted from the reports of Apple Inc. over the period from 2013 to 2022. In this example, BERTopic yielded five topics. Topic 1 ("1_price_competitors_competitive...") was referenced nine times in 2019. Subsequently, the mean distribution of topics per year was calculated, resulting in a value of 9/32 for Topic 1 in 2019. This process was repeated for each company and year. By comparing the mean distribution values, it is possible to identify relevant topical changes over time.



APPENDIX 5

Measurement of Variables

Variables	Measurements
Strategic change rhythm	Binary variable: one equals regular change, zero irregular change
Long-term firm performance	Mean industry-adjusted ROA from 2021-2023. ROA is calculated as net income divided by average assets
Firm performance$_t$	Yearly industry-adjusted ROA from 2014-2020
Firm age	Years since the firm's founding
Change diversification	Average yearly diversification change along Palepus entropy measure of each firm's total diversification (Palepu, 1985) from 2014-2020
Acquisition change	Number of acquisitions made by a firm between 2014 and 2020, divided by the total number of strategic changes
Performance crises	A performance crisis is the sum of negative industry-adjusted ROA changes over two successive years, from 2014 to 2020, per firm
No change	Binary variable, coded one if no change occurred between 2014 and 2020
Industry dynamism	Industry dynamism is measured as the antilog of the standard error of the slope regression coefficient, using total sales data from 2014 to 2020 as an independent variable (Keats & Hitt, 1988)
Industry clockspeed	The industry-wide average number of changes occurring from 2014 to 2020 (Nadkarni & Narayanan, 2007)

APPENDIX 6

Robustness: No change

Variable	DV: Long-term firm performance 2021-2023 Model 1b	DV: Long-term firm performance 2021-2023 Model 1c
Intercept	0.022 (0.01) [0.009]	0.022 (0.01) [0.008]
Controls:		
Firm age	0.000 (0.00) [0.003]	0.000 (0.00) [0.003]
Change diversification	0.002 (0.00) [0.469]	0.002 (0.00) [0.444]
Acquisition change	0.006 (0.01) [0.332]	0.006 (0.01) [0.317]
Firm performance 2014	0.109 (0.03) [0.000]	0.106 (0.03) [0.000]
Firm performance 2015	-0.120 (0.03) [0.000]	-0.115 (0.03) [0.001]
Firm performance 2016	0.058 (0.04) [0.124]	0.051 (0.04) [0.166]
Firm performance 2017	0.090 (0.03) [0.009]	0.099 (0.03) [0.004]
Firm performance 2018	0.240 (0.03) [0.000]	0.240 (0.03) [0.000]
Firm performance 2019	0.068 (0.02) [0.004]	0.068 (0.02) [0.003]
Firm performance 2020	0.118 (0.02) [0.000]	0.118 (0.02) [0.000]
Performance crises	-0.002 (0.00) [0.174]	-0.002 (0.00) [0.126]
Hypotheses:		
Strategic change rhythm[a]	-0.012 (0.00) [0.005]	
Strategic change rhythm [no change][b]		0.020 (0.01) [0.111]
Strategic change rhythm [regular change][b]		-0.012 (0.00) [0.005]
N:	609	621
R^2:	0.45	0.46
R^2-adjusted:	0.43	0.44
F-statistic:	23.84 [0.000]	24.14 [0.000]
AIC	-2122.71	-2166.72
BIC	-2030.06	-2069.23

Notes. OLS regression analysis. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported.

[a] strategic change rhythm is a binary variable, [b] strategic change rhythm is a categorical variable with three values: *irregular*, *regular*, and *no change*

APPENDIX 7

Robustness: Study Period 2011-2020

Variable	DV: Long-term firm performance 2018-2020 Model 5a	Model 5b Industry dynamism	Model 5c Industry clockspeed
Intercept	0.031 (0.01) [0.017]	0.026 (0.01) [0.016]	0.028 (0.01) [0.016]
Controls:			
Firm age	0.000 (0.00) [0.002]	0.000 (0.00) [0.002]	0.000 (0.00) [0.002]
Change diversification	-0.007 (0.01) [0.493]	-0.007 (0.01) [0.499]	-0.007 (0.01) [0.494]
Acquisition change	0.002 (0.01) [0.733]	0.002 (0.01) [0.711]	0.002 (0.01) [0.751]
Firm performance 2011	0.029 (0.03) [0.414]	0.029 (0.03) [0.413]	0.028 (0.04) [0.419]
Firm performance 2012	0.048 (0.04) [0.226]	0.048 (0.04) [0.225]	0.048 (0.04) [0.223]
Firm performance 2013	-0.032 (0.04) [0.433]	-0.032 (0.04) [0.421]	-0.032 (0.04) [0.431]
Firm performance 2014	0.006 (0.03) [0.850]	0.004 (0.03) [0.898]	0.006 (0.03) [0.870]
Firm performance 2015	0.051 (0.04) [0.155]	0.053 (0.04) [0.136]	0.052 (0.04) [0.149]
Firm performance 2016	0.153 (0.04) [0.000]	0.151 (0.04) [0.000]	0.153 (0.04) [0.000]
Firm performance 2017	0.277 (0.04) [0.000]	0.278 (0.04) [0.000]	0.277 (0.04) [0.000]
Performance crises	-0.007 (0.00) [0.000]	-0.007 (0.00) [0.000]	-0.007 (0.00) [0.000]
Hypotheses:			
Strategic change rhythm	-0.007 (0.01) [0.436]	-0.007 (0.01) [0.427]	-0.005 (0.01) [0.564]
Industry dynamism		0.002 (0.00) [0.419]	
Mod: Strategic change rhythm		-0.010 (0.01) [0.096]	
Industry clockspeed			0.003 (0.00) [0.268]
Mod: Strategic change rhythm			-0.014 (0.01) [0.063]
R^2:	0.43	0.43	0.43
R^2-adjusted:	0.41	0.41	0.41
F-statistic:	21.671 [0.00]	20.687 [0.00]	20.853 [0.00]
AIC	-2,004.11	-2,003.15	-2,002.39
BIC	-1,912.13	-1,906.79	-1,906.02

Notes. OLS regression analysis. N = 590. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported.

APPENDIX 8

Robustness A: Measurement I

Variable	DV: Long-term firm performance 2021-2023 Model 6a	Model 6b Industry dynamism	Model 6c Industry clockspeed
Intercept	0.020 (0.01) [0.018]	0.012 (0.01) [0.227]	0.014 (0.01) [0.032]
Controls:			
Firm age	0.000 (0.00) [0.005]	0.000 (0.00) [0.006]	0.000 (0.00) [0.003]
Change diversification	0.002 (0.00) [0.458]	0.002 (0.00) [0.392]	0.002 (0.00) [0.488]
Acquisition change	0.006 (0.01) [0.339]	0.005 (0.01) [0.346]	0.006 (0.01) [0.277]
Firm performance 2014	0.102 (0.03) [0.000]	0.101 (0.03) [0.000]	0.095 (0.03) [0.001]
Firm performance 2015	-0.128 (0.03) [0.000]	-0.122 (0.03) [0.000]	-0.120 (0.03) [0.000]
Firm performance 2016	0.052 (0.04) [0.159]	0.054 (0.04) [0.148]	0.055 (0.04) [0.136]
Firm performance 2017	0.117 (0.04) [0.001]	0.111 (0.04) [0.002]	0.115 (0.04) [0.001]
Firm performance 2018	0.203 (0.03) [0.000]	0.197 (0.03) [0.000]	0.200 (0.03) [0.000]
Firm performance 2019	0.120 (0.03) [0.000]	0.113 (0.03) [0.000]	0.117 (0.03) [0.000]
Firm performance 2020	0.107 (0.02) [0.000]	0.127 (0.02) [0.000]	0.110 (0.02) [0.000]
Performance crises	-0.002 (0.00) [0.305]	-0.001 (0.00) [0.376]	-0.002 (0.00) [0.271]
Hypotheses:			
Strategic change rhythm	-0.012 (0.00) [0.007]	-0.011 (0.00) [0.008]	-0.010 (0.00) [0.023]
Industry dynamism		0.006 (0.00) [0.018]	
Mod: Strategic change rhythm		-0.009 (0.00) [0.024]	
Industry clockspeed			0.007 (0.00) [0.015]
Mod: Strategic change rhythm			-0.014 (0.01) [0.007]
R^2:	0.45	0.46	0.46
R^2-adjusted:	0.44	0.44	0.44
F-statistic:	24.238 [0.00]	22.603 [0.00]	23.691 [0.00]
AIC	-2,108.98	-2,112.96	-2,114.61
BIC	-2,016.58	-2,011.76	-2,017.81

Notes. OLS regression analysis. N = 602. The reduced number of N is due to more observations without change. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported. Strategic change rhythm includes change events like closed mergers and acquisitions, business expansions, split-offs, and discontinued operations/downsizings.

APPENDIX 9

Robustness B: Measurement II

Variable	DV: Long-term firm performance 2021-2023 Model 7a	Model 7b Industry dynamism	Model 7c Industry clockspeed
Intercept	0.025 (0.01) [0.004]	0.017 (0.01) [0.105]	0.015 (0.01) [0.019]
Controls:			
Firm age	0.000 (0.00) [0.011]	0.000 (0.00) [0.017]	0.000 (0.00) [0.012]
Change diversification	0.002 (0.00) [0.463]	0.002 (0.00) [0.423]	0.002 (0.00) [0.493]
Firm performance 2014	0.115 (0.03) [0.000]	0.119 (0.03) [0.000]	0.114 (0.03) [0.000]
Firm performance 2015	-0.138 (0.03) [0.000]	-0.141 (0.03) [0.000]	-0.139 (0.03) [0.000]
Firm performance 2016	0.053 (0.04) [0.169]	0.058 (0.04) [0.131]	0.059 (0.04) [0.127]
Firm performance 2017	0.113 (0.04) [0.003]	0.104 (0.04) [0.005]	0.108 (0.04) [0.004]
Firm performance 2018	0.208 (0.03) [0.000]	0.207 (0.03) [0.000]	0.209 (0.03) [0.000]
Firm performance 2019	0.125 (0.03) [0.000]	0.121 (0.03) [0.000]	0.124 (0.03) [0.000]
Firm performance 2020	0.113 (0.02) [0.000]	0.126 (0.02) [0.000]	0.110 (0.02) [0.000]
Performance crises	-0.002 (0.00) [0.159]	-0.002 (0.00) [0.190]	-0.003 (0.00) [0.129]
Hypotheses:			
Strategic change rhythm	-0.001 (0.00) [0.721]	-0.001 (0.00) [0.794]	-0.001 (0.00) [0.846]
Industry dynamism		0.006 (0.00) [0.024]	
Mod: Strategic change rhythm		-0.007 (0.00) [0.054]	
Industry clockspeed			0.008 (0.00) [0.008]
Mod: Strategic change rhythm			-0.009 (0.00) [0.054]
R^2:	0.46	0.46	0.46
R^2-adjusted:	0.44	0.44	0.44
F-statistic:	24.341 [0.00]	22.493 [0.00]	23.426 [0.00]
AIC	-1,980.44	-1,982.93	-1,982.31
BIC	-1,893.56	-1,887.37	-1,891.09

Notes. OLS regression analysis. N = 569. The reduced number of N is due to more observations without change. Standard errors are in parentheses and p-values in brackets. Industry-fixed effects are included but not reported. Strategic change rhythm includes change events like business expansions, split-offs, and discontinued operations/downsizings.

CONCLUSION

This cumulative dissertation contributes to the understanding of the complex and multifaceted nature of strategic change. Based on three interrelated studies, this dissertation explores multidimensional conceptualizations of strategic change, its antecedents and outcomes, specifically the dynamics between firm performance and strategic change, the role of CVC in driving strategic change, and the impact of strategic change rhythms on long-term firm performance. Collectively, the findings from these studies contribute to a more nuanced understanding of this complex dynamic and provide valuable insights for strategic management theory and practice.

Summary of Findings

The following section provides a comprehensive summary of the key findings and conclusions of the research and analysis.

Study 1. In the first study, a comprehensive meta-analysis was conducted to reassess the existing understanding of how firm performance impacts strategic change and provides significant insights into how firms respond to different performance levels through strategic changes. The analysis is based on 82 empirical studies, covering data from 29,303 firms over several decades. It confirms a generally positive relationship between poor firm performance and strategic change, indicating that firms often alter their strategy when experiencing underperformance. This supports the behavioral theory of the firm, which posits that poor performance triggers a "problemistic" search regarding opportunities to overcome the performance shortfall.

The study further distinguishes between business strategic change, which involves adjustments within specific business units, and corporate strategic change, which encompasses broader organizational transformations such as mergers and acquisitions or divestiture. Our findings indicate that these types of strategic change are differentially affected by poor firm performance. In particular, firms tend to pursue business strategic change in response to poor

performance. Conversely, the study reveals that corporate strategic change is not significantly influenced by poor firm performance.

In addition, the study highlights the significance of environmental factors and integrates two key moderators in the relationship between poor firm performance and strategic change: risk-taking and temporal focus. Firms operating in risk-affine environments are more likely to engage in strategic change, particularly in terms of business strategic change. Additionally, firms operating in environments with long-term focus are more likely to engage in strategic change, particularly in terms of business strategic change, where extended planning periods allow for substantial adjustments. However, this moderation is less evident in the context of corporate strategic change, indicating that broader changes may necessitate different risk- and time-related considerations.

Study 2. The second study examines the role of CVC investments in facilitating strategic change. The study, which analyzed longitudinal data from 1,458 CVC units and 6,751 transactions, demonstrates that CVC investments significantly influence product portfolio and geographic change. Accordingly, CVC investments serve as a catalyst for diversification and expansion endeavors. This impact is primarily attributed to the influence of CVC investments on access to new technologies and foreign markets, facilitating firms' expansion of product offerings and penetration into new geographic regions.

The findings indicate that firms engaged in CVC are more likely to diversify their product offerings, particularly when they invest in ventures within close industries. This proximity enables the transfer and integration of new knowledge, facilitating more effective product line adaptation. Furthermore, the analysis indicated a positive influence of CVC on a firm's geographic expansion. The study suggests that analogous to the industry distance observed with respect to product portfolio change, the cultural distance between the parent firm and the venture moderates this effect. It can be argued that both moderators face challenges related to the greater distance between the parent and the venture due to factors such as

unfamiliarity, increased risk, and difficulties in integration. The results indicate that these challenges hinder the efficacy of CVC in promoting product portfolio and geographic change.

Moreover, the study demonstrates that the benefits of CVC investments on product portfolio change become increasingly evident over time. This indicates that firms require time to assimilate and fully utilize the knowledge gained from these investments. To conclude, the study highlights the strategic significance of CVC, particularly when the parent firms consider cultural and industrial proximity to maximize the positive impacts on strategic change. Overall, the study contributes to the understanding of CVC as an instrument for driving strategic change.

Study 3. The final study examines the impact of the rhythm of strategic change, specifically whether a regular or irregular change rhythm affects long-term firm performance. Additionally, it posits that external environmental factors, such as industry dynamism and clockspeed, moderate these change rhythms' efficacy. The analysis, based on longitudinal data comprising S&P 500 firms from 2014 to 2023, indicates that irregular change rhythms are associated with superior long-term performance compared to regular rhythms.

Considering the firm's alignment with its environmental contingencies, this effect appears to be more pronounced in high-dynamic and fast-paced industries, where conditions are unpredictable and flexibility is crucial, and less pronounced in stable and slow-paced industries, where consistent change rhythms are more beneficial, providing stability and balance. In addition, this study introduces a novel yet robust text-based method for measuring strategic change. This method is based on analyzing topical changes in annual reports, which validates previous findings. The study highlights the importance of aligning strategic change with external environmental factors and notes its impact on a firm's long-term performance.

Theoretical Contributions

The individual studies make significant contributions to several key areas of strategic management theory. First, the dissertation presents a nuanced understanding of strategic change, emphasizing the importance of differentiating between various types of changes, such

as business and corporate strategic changes (e.g., Ginsberg, 1988; Müller & Kunisch, 2018; Puranam & Vanneste, 2016), and dimensions like product portfolio and geographic strategic change (e.g., Westphal & Fredrickson, 2001). This refined perspective helps reconcile previously conflicting findings in the literature by offering a more detailed framework for analysis.

Furthermore, this dissertation highlights the importance of external factors, including contextual and environmental contingencies such as risk-taking (e.g., DesJardine & Shi, 2021; Sobrepere i Profitós, Keil, & Kuusela, 2022), temporal aspects, like temporal orientation (e.g., Nagel, 2021), industry clockspeed (e.g., Nadkarni & Narayanan, 2007) and industry dynamism (e.g., Dess & Beard, 1984) as well as industry and cultural distances (e.g., Keil, Autio, & George, 2008; Kogut & Singh, 1988), in influencing the efficacy of strategic changes. This emphasis on external circumstances offers a more comprehensive understanding of the factors that shape strategic outcomes.

The dissertation further investigates the relationship between CVC investments and strategic change, demonstrating how CVC can facilitate strategic change. It underscores the significance of interorganizational learning in strategic management (e.g., Baldi, Baglieri, & Corea, 2015; Dushnitsky & Lenox, 2005; Yang, 2012). However, it also recognizes the constraints imposed by cultural and industry differences, which can restrict the efficacy of CVC in promoting change.

Finally, the dissertation presents a conceptualization of strategic change as a dynamic process rather than a static event (e.g., Klarner & Raisch, 2013). This dynamic view highlights the importance of aligning the rhythms of change with environmental conditions, offering a more comprehensive framework for analyzing the long-term impacts of strategic change. This approach facilitates a more nuanced understanding of the continuous and evolving nature of strategic change.

Practical Implications

The dissertation presents a number of implications for managers and practitioners. Firstly, when making strategic decisions, it is imperative that managers consider the specific type of strategic change in question, along with the inherent risks and temporal factors associated with it. Indeed, firms in short-term oriented environments and risk-averse contexts tend to initiate fewer strategic changes. Moreover, this environmental influence primarily affects business strategic change, not corporate strategic change, which tends to be more planned and thoughtful. This understanding enables the adaptation of strategies to align with the specific needs and context of the firm, ensuring that decisions are well-informed and consistent with the company's objectives and market conditions.

Secondly, in leveraging CVC, firms can strategically utilize such investments to drive both product and geographic strategic change. However, managers should be aware of the heightened risks associated with investments in culturally and industry-distant sectors. Effective risk management strategies should be in place to mitigate potential challenges and maximize the benefits of such diversification approaches.

Finally, it is imperative for firms to adapt to environmental dynamics in order to maintain competitiveness. Therefore, firms must align their strategic change rhythms with the pace and dynamism of their respective industries. In more stable environments, a regular rhythm of change may be more advantageous. Conversely, in dynamic, fast-paced industries, a more irregular rhythm of change could help maintain agility and continuous alignment with market trends.

Future Research Directions

The dissertation proposes a number of potential avenues for future research that could contribute to a deeper comprehension of strategic change. A first avenue for further research is the expansion of geographic and cultural perspectives. While this dissertation conducted analyses primarily within a single country, cross-country analyses could better illuminate

institutional, regulatory, and cultural differences. This approach would enhance the robustness of the research findings and provide deeper insights into country-specific influences on strategic business decisions. Furthermore, using more refined measurement instruments, such as those capturing cultural diversity, could contribute to a more precise analysis.

A second avenue for future research is the expansion of data sources to analyze strategic changes. While existing research primarily relies on archival data or data collected through extensive surveys, future studies could increasingly utilize automated methods. Building on our approach, using data from social media, corporate websites, and other forms of corporate communication could provide a more comprehensive view of the strategic orientation and changes within companies, allowing for a more nuanced understanding of strategic changes.

A final avenue for future research is examining interactions between different strategic instruments, which presents a promising field of research. While our study adopted a somewhat narrow focus, future research could analyze the synergies and interdependencies between forms of collaboration, such as CVC transactions, alliances, and acquisitions. A detailed analysis of these interactions can provide valuable insights into corporate strategic planning, demonstrating how various instruments can be effectively combined to promote strategic change.

In conclusion, these methodologies present promising avenues for future investigation. They have the potential to enhance our comprehension of strategic business decisions and propose novel pathways for companies to navigate successfully in an increasingly complex and globalized environment.

Conclusion

Strategic change is of paramount importance for a firm's competitiveness and survival. At the same time, it is a multifaceted and complex concept. Therefore, this dissertation presents a comprehensive analysis of the various strategic change conceptualizations, including examining antecedents, outcomes, and moderating environmental factors. The analysis integrates findings from three individual studies, which offer distinctive insights that

collectively contribute to a more nuanced understanding of strategic change. Thus, in order to fully understand strategic change, it is essential to consider its various aspects.

Proceeding in light of these insights: Change it, baby!

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AFFIDAVIT

„Ich erkläre hiermit, dass ich die vorgelegten und nachfolgend aufgelisteten Aufsätze selbstständig und nur mit den Hilfen angefertigt habe, die im jeweiligen Aufsatz angegeben oder zusätzlich in der nachfolgenden Liste aufgeführt sind. In der Zusammenarbeit mit den angeführten Koautoren war ich mindestens anteilig beteiligt. Bei den von mir durchgeführten und in den Aufsätzen erwähnten Untersuchungen habe ich die Grundsätze guter wissenschaftlicher Praxis, wie sie in der Satzung der Justus-Liebig-Universität Gießen zur Sicherung guter wissenschaftlicher Praxis niedergelegt sind, eingehalten."

- Kaiser, C., Kunisch, S., & Bausch, A. (2023). REVISITING THE RELATIONSHIP BETWEEN FIRM PERFORMANCE AND STRATEGIC CHANGE: A META-ANALYSIS AND CONCEPTUAL EXTENSION. *Working Paper.*
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Christian Kaiser