

THE TIME-DIMENSION IN STRATEGIC CHANGE AND FIRM PERFORMANCE:  
THE SOUTH KOREAN CONTEXT

by

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To my parents,

Being deeply loved by you has given me strength and courage to live this grateful life.

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## **ABSTRACT**

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The management of time in an organization is a fundamental activity for the survival and growth of firms. In the field of strategy, time, albeit under-studied, has received increasing attention among scholars. However, in reviewing multiple conceptions of time in strategic change research, scholars have failed to develop consistent and sound theories and constructs of time. Thus, this study systematically organizes existing knowledge about time and develops a comprehensive theoretical framework that accurately describes the dynamic temporal patterns of strategic change. To explain, by mapping various patterns of strategic change into the time continuum, this study identifies five objective time-dimensions in strategic change, namely, 1) regularity, 2) eventfulness, 3) frequency, 4) acceleration, and 5) polychronicity. In addition, this study proposes two time-dimensions of which the temporal patterns of strategic change are subjectively interpreted: 1) linearity and 2) cyclicity. More importantly, using a sample of 172 small and medium-sized businesses operating in various industries in South Korea, this study finds that these time-dimensions of strategic change have distinct performance effects. Taken together, this study contributes to the emerging temporal research by explicitly developing the time-dimension in strategic change. Also, this study offers valuable insights into strategic change research by determining the right timing for the execution of strategic change.

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## CHAPTER 1

### STATEMENT OF PURPOSE

Firms lack factual information regarding their business environments (Child, 1972; Duncan, 1972). Under such conditions, the management of time in organizations is a fundamental activity for the survival and growth of firms (Bluedorn & Denhardt, 1988). In the field of strategy, time has received growing attention among scholars (Kunisch, Bartunek, Mueller, & Huy, 2017; Mosakowski & Earley, 2000). For example, Hambrick and Fredrickson (2001: 55) stressed the importance of time to strategy as most strategies require plans for “the speed and sequence of major moves to take in order to heighten the likelihood of success.” Also, Eisenhardt and Martin (2000) argued that in dynamic environments where customer preference, technology, and/or regulation change fast, time becomes a central aspect of strategy. However, even though prior studies have expanded the theoretical understanding of time since the beginning (e.g., Ancona, Goodman, Lawrence, & Tushman, 2001a; Bluedorn & Denhardt, 1988; Crossan, Cunha, Vera & Cunha, 2005; Cunha, 2004; Das 1993; George & Jones, 2000; Hopp & Green, 2017; Mosakowski & Earley, 2000), time in strategic management research is still understudied. Indeed, Crossan et al. (2005: 129) discussed that research on time in strategy is in a “still-emergent state.” More recently, Kunish et al. (2017) also explained that there is still a lack of literature on time to precisely describe organizational phenomena.

Time is closely intertwined with strategic change because the actual term of *change* implies the presence and importance of time (Kunish et al., 2017). Due to the intimate bond between time and strategic change, this study focuses on time in strategic change. Yet, in reviewing strategic change research, the scope of strategic change has not yet reached a

consensus. Typically, many studies have primarily focused on a change in diversification (i.e., adding new product and service segments) and/or divestiture (i.e., withdrawing from a business segment) domains to refer to strategic change (e.g., Goodstein & Boeker, 1991; Klaner & Raisch, 2013; Wiersema & Bantel, 1992). This typical conceptualization has been often used to capitalize on historical secondary data (Finkelstein & Hambrick 1990). However, this conceptualization not fully include a narrower or a wider scope of changes which can still be considered strategic. Strategic change is typically associated with a change in the firm's mission (Gioia, Thomas, Clark, & Chittipeddi, 1994), corporate policies and goals (Gioia et al., 1994), organizational structure (Mantere, Schildt, & Sillince, 2012), business strategies (Shin & Pérez-Nordtvedt, 2018), and resource and capability development and deployment (Crossan et al., 2005). In fact, Mantere et al. (2012: 173) suggested that “strategic change represents a radical organizational change that is consciously initiated by top managers, creating a shift in key activities or structures that goes beyond incremental changes to preexisting processes.” Thus, based on this argument, which is more comprehensive, I provide my own definition of strategic change as a change in key organizational activities that are initiated by top managers to achieve competitive advantage.

The literature on time in strategic change is often messy due to the fact that time is an invisible language (Hall, 1983) which connotes multiple meanings (Ancona, Okhuysen, & Perlow, 2001b; Bluedorn, 2002). Specifically, terminologies referring to time-based concepts often differ even though the connotative meanings of concepts are very much alike. For instance, the concepts of regularity and irregularity in the pattern of consecutive strategic changes (Hashai, Kafouros, & Buckley, 2018; Klarner & Raisch, 2013; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002) are also referred to as even and event times among theorists in another stream of

research (Crossan et al., 2005; Cunha, 2004). Besides, existing studies reveal lack of clarity as to whether the theoretical meanings of time-based concepts accurately describe the patterns of strategic change along with the actual measures of the concepts. For instance, *speed* has been used as a catchall term to mean a quick change or fast changes regardless of its true meaning in various theoretical contexts (e.g., Eisenhardt, 1989; Casillas & Moreno-Menendez, 2014; Perlow, Okhuysen, & Repping, 2002; Vermeulen & Barkema 2002). The concept of speed, however, may not be appropriate to precisely address such firm-level changes because the speed of strategic change can be duration (e.g., Eisenhardt, 1989) or timing (e.g., Khavul, Pérez-Nordtvedt, & Wood, 2010) in a single strategic change and frequency (e.g., Hashai et al., 2018) or acceleration (e.g., Perlow et al. 2002) in a series of strategic changes. Likewise, the conceptual duplication and the broad application of time-based concepts may lead to confusion in building a more elaborate theoretical construct of time in strategic change.

I believe that various time-based concepts and their theoretical meanings should be sophisticatedly classified by limiting the range of theoretical application to address some of these ongoing ambiguities. Therefore, the primary objective of this study is to systematically organize existing knowledge about time in strategic change and categorize each time-based concept into a respective time-dimension. While building this time-dimension in strategic change, the scholarly contributions of this study are fourfold.

First, the development of time-dimensions allows existing time-based concepts to be explicitly identified. Specifically, after examining existing knowledge about time, I provide a refined definition for each time-dimension. Then, grounded in these definitions, I outline what higher-order time-dimensions constitute what lower-order ones. Through this elaborate

classification process, I develop a theoretical framework to minimize the overlap in the meanings of time-based concepts and accurately describe the various temporal patterns of strategic change.

Second, while examining the various temporal patterns of strategic change, I address a critical research gap on the rhythm of strategic change (Huy & Mintzberg, 2003; Klarner & Raisch, 2013). Regrettably, most prior studies have referred to the rhythm of strategic change as regularity (Klarner & Raisch, 2013; Kunisch et al., 2017; Laamanen & Keil, 2008; Shi & Prescott, 2012). However, regularity alone is limited in capturing various temporal patterns of strategic change. Thus, this research gap allows me to explore other temporal insights dispersed across many disciplines. As a result, I conceptualize five objective time-dimensions in strategic change: 1) regularity, 2) eventfulness, 3) frequency, 4) acceleration, and 5) polychronicity that are measured based on the clock and the calendar. Moreover, I conceptualize two additional time-dimensions: 1) linearity and 2) cyclicity that are subjectively experienced during a strategic change(s).

Third, this study expands several attempts to synthesize the contradictory perspectives of time in strategic change. The theory of improvisation as a temporal strategy addresses a situation where a firm makes it up as it goes along (Brown & Eisenhardt, 1997; Crossan et al., 2005; Miner & Moorman, 1995). Similarly, the theory of ambidexterity suggests that successful firms explore new capabilities while exploiting existing ones (Gibson & Birkinshaw, 2004; He & Wong, 2004; Raisch, Birkinshaw, Probst, & Tushman, 2009). Following these suggestions, I posit that dualistic time perspectives can jointly provide performance benefits to firms beyond any independent benefits that each may have. To be more specific, regularity and eventfulness in strategic change are not always contradictory but can be mutually enabling for performance

benefits. Moreover, linearity and cyclicity in strategic change together contribute to superior performance beyond their independent benefits.

Finally, by examining curvilinear (i.e., inverted U-shape) relationships between frequency, acceleration and polychronicity, and firm performance, this study emphasizes the detrimental effect of faster and more changes on a firm's capacity. Although fast speed becomes a strategic imperative in many research contexts (e.g., Baum & Wally, 2003; Bourgeois & Eisenhardt, 1988; Khavul et al., 2010), fast speed is also accompanied by adverse effects (Casillas & Moreno-Menendez, 2014; Vermeulen & Barkema, 2002; Hashai et al., 2015). In this vein, this study provides insights into strategic change research to determine the right time in the execution of strategic change.

This study consists of six chapters. In Chapter 1, as discussed, I provide an overview of the purpose of this study. In Chapter 2, I review the literature on various time-based concepts. I then develop time-dimensions in strategic change based on the extensive literature review. In Chapter 3, I explore the performance implications of the various time-dimensions. In Chapter 4, I describe the detailed process of sampling and measure development. In Chapter 5, I discuss hypotheses testing and results. Finally, in Chapter 6, I discuss the results from Chapter 5, the theoretical contributions of this study, managerial implications, and limitations and avenues for future research.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 The Study of Time in Strategic Change

Under conditions of environmental uncertainty (Greenwood & Hinings, 1996; Teece, Pisano, & Shuen, 1997), firms need to make strategic changes for their long-term sustainability (Klarner & Raisch, 2013). While firms make such changes, the management of time is often essential because time as a strategic imperative can be a source of competitive advantage (Stalk & Hout, 1990; Chen, Damanpour & Reilly, 2010). According to Hambrick and Fredrickson (2001), *staging*, the element of strategy that addresses how fast and in what sequence the focal firm should change, is one of five core elements for the whole body of strategy. They discussed that most strategies do not require either equal speed nor a balanced time frame for each change. Rather, strategic changes are often implemented in sequential phases where some must come first, and those are then followed by others (Hambrick & Fredrickson, 2001). This conceptual argument is in line with an empirical finding that successful firms “link current products to future ones using predictable product intervals and choreographed transition procedures” (Brown & Eisenhardt, 1997: 25). Moreover, Lieberman and Montgomery (1988) discussed the role of the timing of entry in the markets, which is closely related to the success of a firm.

Yet, despite the importance of time in strategic change, many extant studies have dealt with time as a background condition rather than a core theoretical construct (Ancona et al., 2001a; Bluedorn & Denhardt, 1988; Cunha, 2004; Crossan, Cunha, Vera & Cunha, 2005; Das 1993; George & Jones, 2000; Hopp & Green, 2017; Mosakowski & Earley, 2000). Bluedorn and

Denhardt (1988: 299) stated, for example, that “despite the near preoccupation with time on the part of practicing managers, students of organization and management theory have until recently paid relatively little attention to the topic of time.” Importantly, this lack of attention has changed little over the past few years. For instance, Crossan, Cunha, Vera, and Cunha (2005: 129) pointed out that research on time in an organization is in a “still-emergent state.” More recently, Kunish et al. (2017), in their review of time in strategic change, discussed that there is still a paucity of literature on time even though scholars gradually apply diverse time-based concepts to more precisely address organizational phenomena.

Without a doubt, time is a fundamental construct, especially when it comes to human affairs (Bluedorn, 2002; Bluedorn & Denhardt, 1988) because natural languages very often involve various time-based concepts as adverbs or modalities (Gell, 1992; Mosakowski & Earley, 2000). For this reason, the few studies that recognize the importance of time have tried to incorporate time-based concepts in their theory building (Ancona & Chong, 1996; Bluedorn & Denhardt, 1988; George & Jones, 2000; Hopp & Green, 2017; Huy, 2001; Kunisch et al., 2017; Mosakowski & Earley, 2000). For example, George and Jones (2000) encouraged more explicit consideration of time because it helps to clarify the ontological description of human behavior and relationships among people, groups, and even organizations. Specifically, they conceptualized six time-dimensions as core theoretical constructs: 1) the past, future, and present and the subjective experience of time; 2) time aggregations; 3) duration of steady states and rates of change; 4) incremental vs discontinuous change; 5) frequency, rhythm, and cycles; and 6) spirals and intensity. Linking the different time-dimensions to the what, how, and why of theories, they explain how the explicit link leads to more rigorous theory building. In another example from Mosakowski and Earley (2000), the authors reviewed how various time-based



concepts have been applied to human-related research areas such as anthropology, psychology, management, and sociology. Consequently, they proposed five time-dimensions: 1) nature of time; 2) experience of time; 3) time flow; 4) time structure; and 5) temporal referent point. Each time-dimension, albeit not mutually exclusive, broadens managerial strategic options, helps to understand industry conditions, assists to anticipate rival firms' strategic choices, and ultimately facilitates strategic change (Mosakowski & Earley, 2000).

Overall, while strategy scholars borrow concepts, terminologies, and theories established in the different fields of scholarly work, a more systematic treatment of time in the literature, particularly the role of time in strategic change, is still missing. Therefore, in the next section, I explore these.

## **2.2 Time-based Concepts in Strategic Change**

In reviewing time-based concepts at the firm-level of analysis, there are various time aspects, perspectives, and terminologies that surface. Some of these are pace (Bourgeois & Eisenhardt, 1988; Baum & Wally, 2003; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Forbes, 2005; Gordon, Stewart, Sweo, & Luker, 2000; Khavul, Pérez-Nordtvedt, & Wood, 2010), duration (Berends & Antonacopoulou, 2014; George & Jones, 2000; Hopp & Greene, 2017; Kunish et al., 2017), timing (Adam, 2000, Makadok, 1998; Lieberman & Montgomery, 1988; Huff & Robinson, 1994; Huy, 2001), rhythm (Ancona & Chong, 1996; Adam, 2000; Brown & Eisenhardt, 1997; Eisenhardt & Brown, 1998; Hayward, 2002; Huy, 2001; Klarner & Raisch, 2013; Cunha, 2004; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002), frequency (Casillas & Moreno-Menendez, 2014; Hashai, Kafouros, & Buckley, 2018; Klarner & Raisch, 2013; Laamanen & Keil, 2008), sequence (Amburgey & Dacin., 1993; Chang, 1996; Gioia &

Chittipeddi, 1991; Hambrick & Fredrickson, 2005; Miller & Friesen, 1980), incremental & decremental (Adam, 2000; George & Jones 2000; Perlow, Okhuysen, & Repenning, 2002), linear & cyclical time (Bluedorn & Denhardt, 1988; Mosakowski & Earley, 2000; Cunha, 2004; Chaffee 1985; Crossan et al., 2005; Czarniawska, 2004), time pacing & event pacing (Eisenhardt & Brown 1998; Gersick, 1994; Huy, 2001; Brown & Eisenhardt 1997), entrainment (Ancona & Chong, 1996; Pérez-Nordtvedt, Payne, Short, & Kedia, 2008), polychronicity (Bluedorn, 2002), objective time & subjective time (George & Jones 2000; Hopp & Greene, 2017), and experienced time (Mosakowski & Earley, 2000), among others.

Although strategy has expanded the theoretical understanding of time to be richer and more textured thanks to the prior studies, the process toward theoretical building is often messy and problematic. This is because time is an invisible language (Hall, 1983) and connotes multiple meanings (Ancona, Okhuysen, & Perlow, 2001b; Bluedorn, 2002). In fact, terminologies referring to time-based concepts, even though the concepts explain almost the same phenomenon, often differ from theorist to theorist. For example, a stream of research refers to *rhythm* as regularity (Klarner & Raisch, 2013; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002). A common way to understand rhythm is the dichotomy between regularity and irregularity (e.g., Hashai et al., 2018; Klarner & Raisch, 2013; Kunisch et al., 2017; Laamanen & Keil, 2008). If a firm initiate and implement several strategic changes on a consistent basis with equal timeframes in between, this implementation pattern is considered a regular change. Otherwise, it is regarded as an irregular change (Klarner & Raisch, 2013). However, the concept of regularity & irregularity is almost identical to the concept of even & event time used in the literature by different theorists. Even time is commonly understood as “divisibility into equalized” portions of time (Bluedorn & Denhardt, 2000; Clark, 1978, 1985). Thus, it describes

multiple changes that are evenly balanced in length. In contrast, event time addresses a reaction to events, such as internal and/or external changes, which are often irregular (Crossan et al., 2005; Cunha, 2004). Likewise, both concepts, regularity & irregularity and even & event time, are very much alike in their nature.

The conceptual duplication of time-based concepts is not the only issue. Too broad theoretical application of a time-based concept often confuses people to precisely grasp its true meaning. Indeed, the diverse operationalization of a time-based concept, speed, provides reasonable evidence. The speed of strategic change, for example, is defined as how fast the change is implemented (Huy, 2001) and it has been adopted in various research contexts such as strategic decision-making (Eisenhardt, 1989; Perlow et al., 2002), internationalization process (Casillas & Moreno-Menendez, 2014; Khavul et al., 2010), merger and acquisition events (Laamanen & Keil, 2008; Vermeulen & Barkema 2002), strategic alliance formations (Hashai et al., 2018), and so on. However, extant studies often lack operational consensus because speed has been measured in various ways. Specifically, speed has been measured in terms of *duration*, *frequency*, *timing*, and *acceleration*. All of these are time-based concepts, but all of them are different.

Let me explain each methodological mechanism. First, the speed of strategic change has been measured through a *duration* methodological mechanism referring to the time length between the beginning of strategic change and end of the completion (Eisenhardt, 1989; Casillas & Moreno-Menendez, 2014). For instance, Casillas and Moreno-Menendez (2014: 91) measured the speed of internationalization through “the time between each operation and the one immediately thereafter (number of days) as an indicator of the speed of the operation.” Similarly, Eisenhardt (1989: 549) measured the speed of strategic decision-making as “duration using the

beginning and end times for each decision, with starting time indicated by the first reference to a deliberate action such as scheduling a meeting or seeking information and ending time indicated by the time at which a commitment to act was made.”

Second, speed has also been measured through a *frequency* methodological mechanism. The speed of strategic change has been operationalized as the number of strategic changes within a certain period of time (Hashai et al., 2018; Laamanen & Keil, 2008). Hashai et al. (2018: 176) stated that “the expansion speed of a firm’s alliance portfolio is operationalized as the number of new alliances that the firm has established in a given year (derived from alliance announcements).” Along the same lines, Laamanen and Keil (2008: 667) operationalized speed as “the average number of acquisitions that a firm undertakes during the focal and the preceding two years.”

Third, the speed of strategic change has also been measured based on a *timing* methodological mechanism. This mechanism stresses when is the first time – the initial point in the time continuum - that a strategic change is initiated and implemented (Khavul et al., 2010; Vermeulen & Barkema 2002). For instance, Khavul et al. (2010: 112) described that “consistent with previous research (Autio et al., 2000; Oviatt and McDougall, 2005; Rialp et al., 2005), speed of internationalization was based on the age at which the firm had its first international sale.” In a similar vein, Vermeulen and Barkema, (2002: 643) stated that “speed can be measured through the variable ‘number of years since the firm’s first foreign expansion,’ i.e., how many years it took the firm to reach its current international posture.”

Lastly, the *acceleration* methodological mechanism has also been used to measure speed. Scholars have measured the speed of strategic change with the rate of change of frequency over time. For instance, Perlow et al., (2002: 933) noted that “to induce the key categories relating

speed and decision-making, we coded the frequency and content of decisions made in the top management meetings.” From the case study of an internet venture, they recorded the rate of change of frequency in decision-making over its lifespan.

To sum up, speed has been used as a catchall term to mean different things (i.e., duration, frequency, timing, and acceleration) in different theoretical contexts. While the examples only show the theoretical and operational discrepancy in measuring speed as it relates to strategic change, such discrepancy is also prevalent in other time-based concepts. Thus, I believe that the lack of clarity of time-based concepts can distort the precise description of such an important organizational phenomenon. Furthermore, it may lead to confusion in building a more elaborate theoretical construct of time in strategic change. Thus, in order to provide theoretical and methodological accuracy of a time-based concept in describing a firm-level change, I believe that various time-based concepts and their theoretical meanings should be clearly classified by limiting their range of theoretical application. Therefore, as part of my efforts, I systematically categorize each time-based concept into a respective time-dimension. The process is to discover what higher-order time-dimensions constitute what lower-order ones.

In building the time-dimensions of strategic change, I do not include every single time-based concept presented by extant studies. Instead, I exclude some of those when their theoretical meaning is almost the same as another concept I do use. For example, objective time, which I will use in this study, has also been described as absolute clock time, mechanical time, or chronological time (Czarniawska, 2004; Bluedorn & Denhardt, 1988; Hopp & Green, 2017). In this case, I only include objective time because the terminology is easier to grasp due to its implicit meaning and it is more commonly used than the other concepts. Moreover, I also exclude some time-based concepts in which the range of theoretical application is too broad. For

instance, one of the six time-dimensions developed by George and Jones (2000) is *spirals and intensity*. This concept addresses certain phenomena which are “spiral over time meaning that the intensity of the phenomenon increases in an upward direction, or decreases in a downward direction, nonlinearity, exponentially, sometimes over a short period of time” (George & Jones, 2000: 664). As this concept includes multiple theoretical meanings (i.e., accelerated time, decelerated time, nonlinear time, exponential time, and a moment in time), I try to break it down into discrete time-dimensions. Overall, after an extensive review of extant studies, I develop a table of the time-dimension of strategic change. The time-dimension is presented in Table 1, which appears in Appendix A.

### **2.3 The Objective and Subjective Interpretation of Time in Strategic Change**

Table 1 shows that at the highest order, the time-dimension of strategic change can be classified as either objective or subjective. I define the objective interpretation of time as mapping strategic changes into the time continuum (e.g., Ancona et al., 2001b; Kunisch et al., 2017). Generally, the objective interpretation of time is dominated by the Western educational system with the evidence presented by notions like *lesson times, time tables, schedules, records, reviews, and plans* (Crossan et al., 2005). Thus, the objective interpretation of time indicates time which is measurable based on the clock and the calendar (Ancona et al., 2001b; Bluedorn & Denhardt, 1988; Mosakowski & Earley, 2000). Ancona et al. (2001b: 514) described that the objective interpretation of time “depicts the continuum as linear-infinitely divisible into objective, quantifiable units such that the units are homogeneous, uniform, regular, precise, deterministic, and measurable”. As the objective interpretation of time contains multiple discrete moments (Bluedorn & Denhardt, 1988), it allows to precisely measure a single point in time and

from the point to infinity on the time continuum. Therefore, under the objective interpretation of time perspective, managers can keep a record of strategic changes on the calendar over a specific period of time.

On the other hand, as Table 1 shows, the subjective interpretation of time, albeit not clearly represented in strategy, is referred to as the temporal experience of strategic changes with respect to whether the past evolves into the present, which then unfolds into the future. Depending on whether the past is repeated over time or not, it is subdivided into either linear time or cyclical time (Crossan et al., 2006; Cunha, 2004). In this vein, George and Jones (2000: 659) noted that “[t]ime is intimately bound up with the content of human experience in that the past and future are reflected in the present (Heidegger, 1962; Schutz, 1967). The past preconditions the present and is responsible for its taken-for-granted nature; the future is embedded in the present in terms of expectations, possibilities, and strivings (Heidegger, 1962; Mead, 1934; Schutz, 1967)”. This statement implies that the present can be further apart from the past and the future (linear time) as human interpretation breaks into transitions (Crossan et al., 2006; Cunha, 2004). However, the past, the present, and the future can also be closely intertwined (cyclical time) based on how individuals conceive time (George & Jones, 2000). Thus, the subjective interpretation of time perspective addresses whether a current strategic change is perceived to advance with novelty or whether is presented in the past.

Both the objective and subjective interpretations of time as the highest-order time-dimensions in strategic change consist of lower-order time-dimensions. As shown in Table 1, the objective interpretation of time, first, consists of two second-order time-dimensions. These dimensions are a single strategic change and a series of strategic changes. A single strategic change is essentially one strategic change at the firm-level. A single strategic change has the

following time-dimensions at the third-order level: duration and timing. The duration of strategic change is the temporal distance between the initiation and the completion of a single strategic change in the time continuum. For example, a single strategic change may take 2 months to initiate and complete. The timing of strategic change refers to the point in time in the time continuum when a single strategic change is initiated. For example, a single strategic change may be initiated in the second quarter of the year.

The other second-order time-dimension under the objective interpretation of time is a series of strategic changes. A series of strategic changes is a collection of consecutive single strategic changes. Thus, a transition period occurs between the end of a single strategic change and the initiation of the next single strategic change. Since the duration of each strategic change and transition periods between changes with different timing points are not always consistent, such collection of strategic changes temporally describe different rhythmic patterns over the time continuum. Therefore, depending on the patterns, I identify five distinctive time-dimensions in strategic change at the third-order level:

1. Regularity in strategic change is the degree to which a series of strategic changes are made on a consistent basis in a specific time frame such that, in high regularity cases, transitions and durations between each consecutive strategic change in the time continuum are relatively equal in temporal distance.
2. Eventfulness in strategic change is the degree to which the firm initiates a series of strategic changes as a response to events - external, internal, or both - such that when eventfulness is high the firm initiates strategic changes every time there is an event. In the time continuum, eventfulness will be observed as jolts or skips of strategic changes with no predictable pattern as events can be regular, irregular or both.



3. Frequency in strategic change refers to how often a series of strategic changes are made within a specific time frame such that a high frequency will display a higher number of strategic change execution timings occurring in the time continuum within a specific time frame.
4. Acceleration in strategic change refers to the rate of change of speed in a series of strategic changes in a specific time frame such that high acceleration is observed when the transitions of each consecutive strategic change in the time continuum get shorter and shorter in temporal distance.  
and
5. Polychronicity in strategic change is the degree to which a series of strategic changes overlap in a specific time frame as opposed to are done sequentially such that very high polychronicity will display no transitions between each consecutive strategic change in the time continuum.

Meanwhile, the subjective interpretation of time, as summarized in Table 1, is the other highest-order time-dimension and it is referred to as the temporal experience of time in strategic change. The subjective interpretation of time also includes two lower-order time-dimensions.

The time-dimensions are:

1. Linearity in strategic change is the degree to which current strategic changes are different from previous strategic changes and will be different from future strategic changes such that consecutive strategic changes over time are novel, unique and out of the box.

2. Cyclicity in strategic change is the degree to which past strategic changes reappear in current and future strategic changes such that consecutive strategic changes are grounded on learning and forecasting by extrapolating the past into the future.

In the next section, I will discuss how duration and timing in strategic change together temporally describe a single strategic change.

### **2.3.1 A Single Strategic Change**

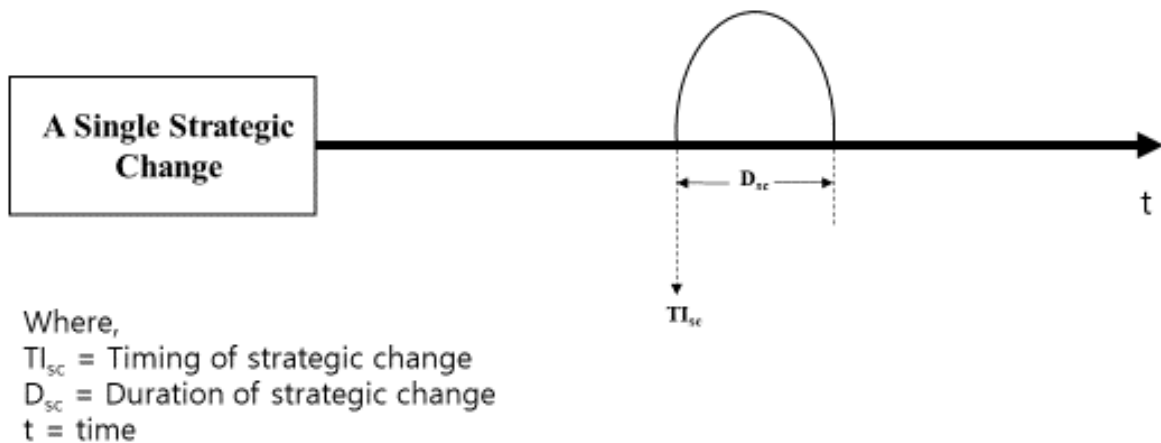
A single strategic change is one of the second-order time-dimensions under the objective interpretation of time. At times, a firm implements a single strategic change. For instance, a firm changes its organizational structure because its corporate level strategy (e.g., diversification, internationalization, retrenchment and the like) creates new challenges (Amburgey & Dacin, 1994). Moreover, environmental conditions such as changes in national development, deregulated national laws, and increased market competition are likely to lead to corporate asset restructuring (Hoskisson, Cannella, Tihanyi, & Faraci, 2004). However, these strategic changes take place only once in the life of the organization and it has been the focus of many strategic change scholars (Kunisch et al., 2017).

A single strategic change can be described temporally through two important time-dimensions at the lowest-order (see Table 1), duration and timing. Figure 1 clearly depicts both timing (i.e.,  $TI_{sc}$ ) and duration (i.e.,  $D_{sc}$ ). Adam (2000: 136) defined duration as “the degree of expansion in time along the time-frame or the past–present–future axis, as such it could be considered a sub-category of the timeframe or the past, present and future dimensions of time.” The definition implies how long a particular state is stable (George & Jones, 2002; Hopp & Green, 2017), which is often referred to as the speed of a single strategic change (Eisenhardt,

1989; Forbes, 2005). In general, strategy scholars adopt the concept of duration to address the period during which a strategic change is initiated and completed (Albert, 2013; Baum & Wally, 2003; Eisenhardt, 1989; Forbes, 2005).

Figure 1

A Single Strategic Change Mapped into the Time Continuum



Accordingly, I define duration as the temporal distance between the initiation and the completion of a single strategic change in the time continuum. In other words, it is the time it takes to start and finish a single strategic change. For example, Eisenhardt (1989) investigated the effect of fast strategic decision in a high-velocity environment on firm performance. In her study, she “measured duration using the beginning and end times for each decision, with starting time indicated by the first reference to a deliberate action such as scheduling a meeting or seeking information and ending time indicated by the time at which a commitment to act was made” (Eisenhardt, 1989: 549). Also, Forbes (2005) investigated determinants of strategic decision speed in the context of new ventures. Similar to Eisenhardt (1989), he measured

strategic decision speed by decision duration which is the number of months between when the firm started to initiate the decision and when the firm completed it.

The second time-dimension concerning a single strategic change is timing as illustrated in Figure 1. Timing refers to the awareness of the right time to act (Albert, 2013) and stresses the importance of the when of a strategic initiative (Kunisch et al., 2017). Therefore, I define timing as the point in time in the time continuum when a single strategic change is initiated. In this vein, a number of studies can fall in this time-dimension. Indeed, when a firm should implement a strategy has been a long-running argument in the literature. For example, scholars have investigated the advantages and the disadvantages of being a first mover in various industries (Huff & Robinson, 1994; Lee, Smith, Grimm, & Schomburg, 2000; Lieberman & Montgomery, 1988; Makadok, 1998; Vanderwerf & Mahon, 1998). The common finding is that the first mover is likely to take advantage of enhanced technological leadership, preemption of assets, and high buyer switching costs (Lieberman & Montgomery, 1988) although the advantages diminish over time (Huff & Robinson, 1994). Similarly, there are many other studies examining when is the right timing for corporate restructuring (e.g., Bergh & Lawlss, 1998; Hoskisson et al., 2004), search and selection activities (Chang, 1996), strategic reorientation (Gordon, Stewart, Sweo, & Luker, 2000), temporal adaptation (Pérez-Nordtvedt, Khavul, Harrison, & McGee, 2014) and so on. Thus, prior studies provide insights regarding when a single strategic change should be initiated in various research contexts.

### 2.3.2 A Series of Strategic Changes Over time

A series of strategic changes is the other second-order time-dimension under the objective interpretation of time. I posit that a series of strategic changes is a collection of each consecutive strategic change within a time frame and that such collection of strategic changes together displays a rhythm. According to the dictionary, a general definition of rhythm is “a movement marked by the regulated succession of strong and weak elements or of opposite or different conditions” (Anon, 1971: 2537). The notion of rhythm has been applied to the organizational setting (Ancona et al., 2001b; Ancona & Chong, 1996; Brown & Eisenhardt, 1997; Huy & Mintzberg, 2003; Klarner & Raisch, 2013; Kunish et al., 2017; Laamanen & Keil, 2008; Shi & Prescott, 2012; Shin & Pérez-Nordtvedt, 2018; Vermeulen & Barkema, 2002). Arguably, while a single strategic change may have a rhythm displayed in its duration (Ancona et al., 2001b), I suggest that a true firm-level rhythm is only evidenced when a series of strategic changes are carried out in the time continuum.

A transition period occurs between the end of a single strategic change and the initiation of the next single strategic change. Figure 2 illustrates durations (i.e.,  $D_{sc1}$ ,  $D_{sc2}$ ,  $D_{sc3}$ , and  $D_{sc4}$ ), timings (i.e.,  $TI_{sc1}$ ,  $TI_{sc2}$ ,  $TI_{sc3}$ , and  $TI_{sc4}$ ), and transition periods (i.e.,  $TR_{sc1}$ ,  $TR_{sc2}$ ,  $TR_{sc3}$ ,  $TR_{sc4}$ , and  $TR_{sc5}$ ) of strategic changes. The rhythm of strategic changes can be observed as a single strategic change is followed by a transition period and then by another strategic change and so on and so forth over time. Miller and Friesen (1980: 271) defined transition as “a package of changes that occur between the onset of the imbalance or stress and the time when some equilibrium or tranquil interval is reached.” Thus, a transition period typically occurs when a firm shifts from one project to the next (Eisenhardt & Brown, 1998) and it preconditions strategic initiatives (Miller & Friesen, 1980). Indeed, the notion of transition has been applied to

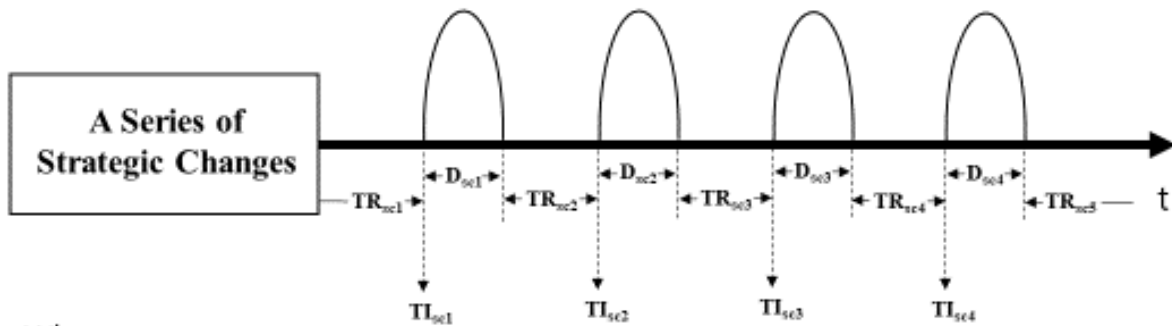
various levels of organizational research. Gersick (1988, 1989), for example, discussed that project teams completed or dropped an initial agenda before they moved on to the next stage. In doing so, the teams were able to renew the contract with outside stakeholders and adopt new perspectives to shape new tasks. Moreover, Miller and Friesen (1980) argued that a transition period allowed firms to shift from one project to others. In fact, a transition period during a tranquil interval occurs just before a critical decision, an influential event, or both such as a replacement of a top executive, an adaptation of innovative production technology, a decision to change organizational structure, an application of new corporate strategies, and a change in the internal and external environment (Miller & Friesen, 1980). Furthermore, Brown and Eisenhardt's (1997) interview revealed that the managers of successful product portfolios started to conceptualize a successive product development in advance while employees were working on completing ongoing projects.

Overall, then, I propose that a series of strategic changes, each with its own duration and timing, combined with their transition periods, forms the rhythm of strategic changes within a given time frame. This argument is theoretically in line with the notion of *the multi-dimensionality of time* in which actions, events, and processes, embedded in *a rhythmic continuum*, have *beginnings*, *ends*, and *pauses*, marked by *transition periods* (Adam, 2000). To put it differently, a series of strategic changes have beginnings (timings) and endpoints - which the temporal distances between them measure their durations - and pauses, which are illustrated by transition periods between each consecutive strategic change. More importantly, and relevant to this study, as the length of durations and transition periods with different timing points vary, a series of strategic changes would show various rhythms or patterns of occurrence of those strategic changes over a specific time frame. Therefore, depending on the patterns, I will closely

examine different time-dimensions in a series of strategic changes. These, which I examine next, are: regularity, eventfulness, frequency, acceleration, and polychronicity in strategic change.

Figure 2

A Series of Strategic Changes Mapped into the Time Continuum



Where,

$TI_{scn}$  = Timing of strategic change n

$D_{scn}$  = Duration of strategic change n

$TR_{scn}$  = Transition before strategic change n

t = time

### 2.3.3 Regularity in Strategic Change

One of the main time-dimensions to describe a rhythmic pattern of strategic change is regularity. Unfortunately, when examining the literature on strategic change rhythm, most prior studies have referred to *regularity* as the rhythm of strategic change (Klarner & Raisch, 2013; Kunisch et al., 2017; Laamanen & Keil, 2008; Shi & Prescott, 2012). However, regularity and rhythm are not the same construct because regularity alone cannot fully describe other diverse rhythmic patterns in a series of strategic changes. Thus, I propose that regularity is only one of five subcategories of the rhythm of strategic change.

In reviewing the literature in the field of strategy, there are only a few existing studies adopting the notion of regularity as a main theoretical construct (Hayward, 2002; Klarner & Raisch, 2013; Laamanen & Keil, 2008; Shi & Prescott, 2012, Shin & Pérez-Nordtvedt, 2018; Vermeulen & Barkema, 2002). When it comes to regularity, those studies generally define it as the timing of consecutive strategic changes in a given time period (Klarner & Raisch, 2013). Their main focus is the *timing maker*, which indicates making strategic changes either regularly or irregularly in terms of consecutive strategic changes (Kunisch et al., 2017). In this vein, Dacko, Liu, Sudharshan, and Furrer (2008: 442) provided the timetable of Gillette's razor launches to show how "Gillette tried to impose a rhythm on the shaving equipment market by regularly introducing breakthrough innovations followed by a series of incremental innovations." Indeed, there are many other examples of how firms adopt regularity in strategic change as a temporal strategy. For example, most apparel retailers strive to launch new product lines, at a minimum, along with seasonal variance (Bhardwaj & Fairhurst, 2010; Miller, McIntyre, & Mantrala, 1993; Shin & Pérez-Nordtvedt, 2018). In the high-tech industry, Samsung Electronics Co., Ltd. and Apple Inc, leading smartphone vendors, generally introduce their flagship models every year (Shin & Pérez-Nordtvedt, 2018). Moreover, US car manufacturers take around 36 months to develop a new car and US computer manufacturers take 14 months for a new personal computer (Griffin, 1997).

On the other hand, irregularity in terms of strategic change addresses a situation where sporadic strategic change patterns exist in the time continuum. Since firms adopting irregularity in strategic change do not have a predetermined schedule for a change, a subsequent strategic change that will take place is not foreseeable. Thus, unlike regularity in strategic change, irregularity displays various erratic rhythmic configurations. In fact, Klarner and Raisch, (2013)



defined the three configurations of irregularity. They investigated changes in corporate strategy initiated over seven consecutive years and codified the changes by using a dummy variable (coded as 1 if a strategic change occurs in a given year). They classified irregularity in strategic change as *focused*, *punctuated*, or *temporary switching*. Specifically, they argued that “[f]ocused changers are companies with long periods of change interrupted by short stability periods (e.g., 1110111). Punctuated changers, on the other hand, are companies with long stability periods interrupted by short periods of change (e.g., 0000100). Lastly, temporarily switching changers combine the focused and punctuated changers by alternating irregularly between periods of change and periods of stability (e.g., 0111000)” (Klarner & Raisch, 2013: 168). These three irregular patterns in strategic change suggest short transitions, long transitions, or both, respectively, but all with varying and inconsistent temporal distances within the time continuum.

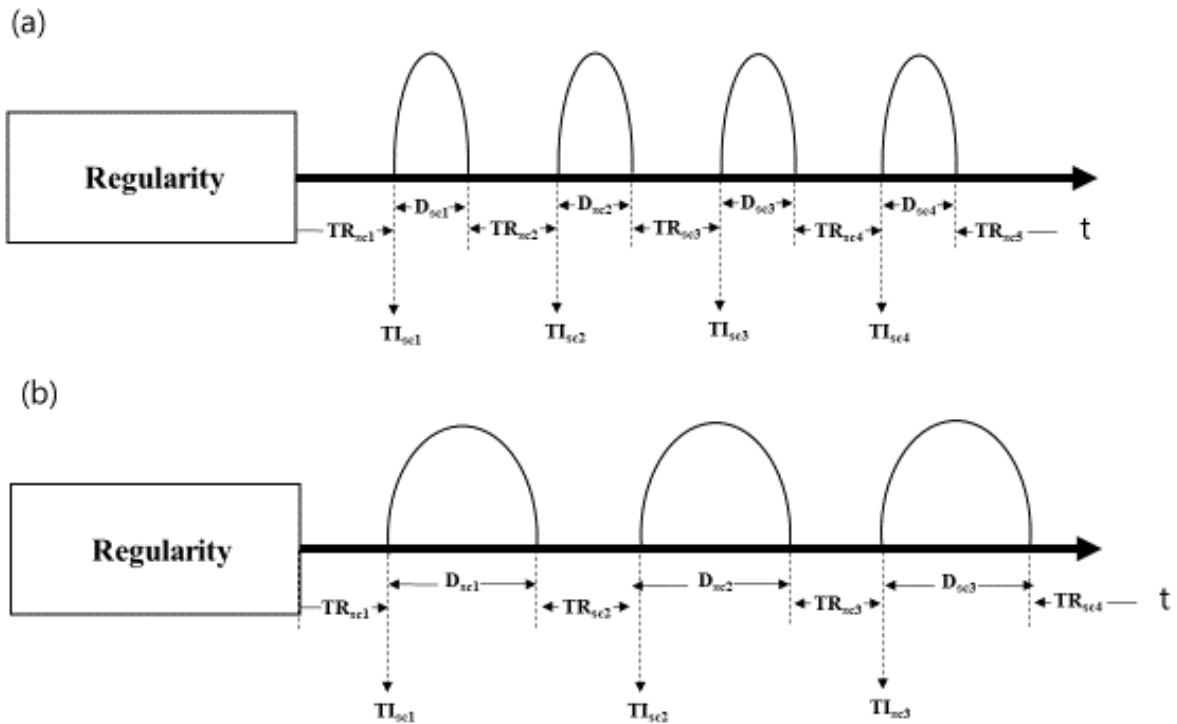
Drawing on prior studies and my work on the development of time-dimension, I define regularity in strategic change as the degree to which a series of strategic changes are made on a consistent basis in a specific time frame such that, in high regularity cases, transitions and durations between each consecutive strategic change in the time continuum are relatively equal in temporal distance.

Figure 3 depicts regularity in strategic changes. Figures 3 (a) and 3 (b) exhibit extremely regular cases. In Figure 3 (a), transitions and durations of consecutive strategic changes would be roughly equal in temporal distance (i.e.,  $TR_{sc1} = TR_{sc2} = TR_{sc3} = TR_{sc4} = TR_{sc5}$  and  $D_{sc1} = D_{sc2} = D_{sc3} = D_{sc4} = D_{sc5}$ , respectively). Also, timings would occur at equal intervals during a specified period of time. Similarly, in Figure 3 (b) the temporal distances of transitions and durations of consecutive strategic changes are relatively equal (i.e.,  $TR_{sc1} = TR_{sc2} = TR_{sc3} = TR_{sc4}$  and  $D_{sc1} = D_{sc2} = D_{sc3}$ , respectively) with balanced timings among consecutive strategic changes. As

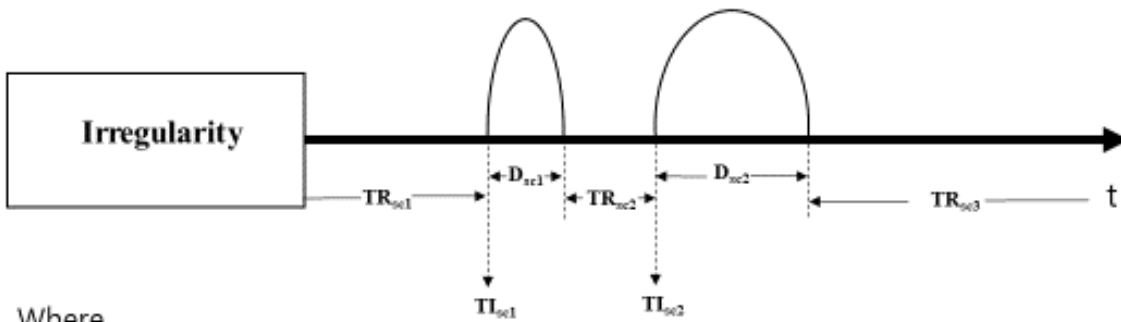
transitions, durations, and timings among a series of strategic changes are predetermined, this predictability allows firms to maintain a manageable time schedule for consecutive strategic changes. On the other hand, under irregularity in strategic change, as shown in Figure 3 (c), neither transitions nor durations would be even (i.e.,  $TR_{sc1} \neq TR_{sc2} \neq TR_{sc3}$ , and  $D_{sc1} \neq D_{sc2}$ , respectively) and timings would not have predictable patterns of occurrence from one specific time frame to the next.

Figure 3

Regularity in Strategic Change Mapped into the Time Continuum



(c)



Where,

$TI_{scn}$  = Timing of strategic change n

$D_{scn}$  = Duration of strategic change n

$TR_{scn}$  = Transition before strategic change n

t = time

### 2.3.4 Eventfulness in Strategic Change

Eventfulness is another time-dimension that describes a rhythmic pattern of strategic change. The primary focus of event time is typically on whether time is a discrete flow or a continuous one (Bluedorn & Denhardt, 1988; Mosakowski & Earley, 2000). Event time requires “a heterogeneous pattern of differentiation” through the occurrence of “meaningful events, including those that are related to seasonal variations” (Bluedorn & Denhardt, 1988:304). It is important to note that eventfulness in strategic change could be displayed in the time continuum in a regular or irregular manner depending on whether the events that the firm responds to occur on a regular (e.g., seasonal change) or irregular (e.g., change in CEO) basis. Hence, regularity and eventfulness are two separate dimensions. In other words, eventfulness implies a more flexible sense of organization in which firms are capable of being highly responsive to internal or external changes, events, or disruptions (Cunha, 2004). Because such high responsiveness to internal and external environments is essentially associated with a firm’s long-term survival, it

has long been a popular topic among scholars (e.g., Aldrich, 1979; Child, 1972; DiMaggio & Powell, 1983; Duncan, 1972; Hannan & Freeman, 1977, 1984; Mizuchi & Fein, 1999).

When it comes to the role of eventfulness, prior studies regardless of whether event time is explicitly theorized or not have stressed the importance of *temporal fit* between a firm and its environments (Ancona & Chong, 1996; Crossan et al., 2005; Pérez-Nordtvedt et al., 2008). In this vein, Crossan et al. (2005) stated that “[w]idespread management concerns - perceptions such as “change is the only constant” and “organizations must strive for ever-flexible adaptation” - simply reformulate what event-time management is all about (Crainer, 1997; Micklethwait & Wooldridge, 1996; Shapiro, 1995).” Besides, Hopp and Greene (2017: 4) discussed that “event time researchers have theorized that organizations that are temporarily synchronized with their external environment achieve superior outcomes (Ancona and Chong, 1996; Khavul et al., 2010). This differs from the traditional strategic fit questions that focus on ‘what’ or ‘how’ to achieve fit (Miles and Snow, 1978) by arguing that questions of ‘when’ activities are done are also important in determining outcomes.” Indeed, the notion of eventfulness (i.e., temporal fit) led scholars to develop the *entrainment* concept which addresses continuing temporal adjustment to events (Ancona & Chong 1996, Hall, 1983; McGrath & Rotchford, 1983; Pérez-Nordtvedt et al., 2008).

The concept of entrainment has been suggested as a valid example of event time (e.g., Crossan et al., 2005; Hopp & Greene 2017). Entrainment which has been migrated from the biological sciences is referred to as the process by which activity cycles of one system synchronize to those of dominant systems (Ancona & Chong 1996, McGrath & Rotchford, 1983). Since the genesis of the concept, it has been applied to various levels of organizational research. Ancona and Chong (1999), for instance, suggested that different external forces hugely

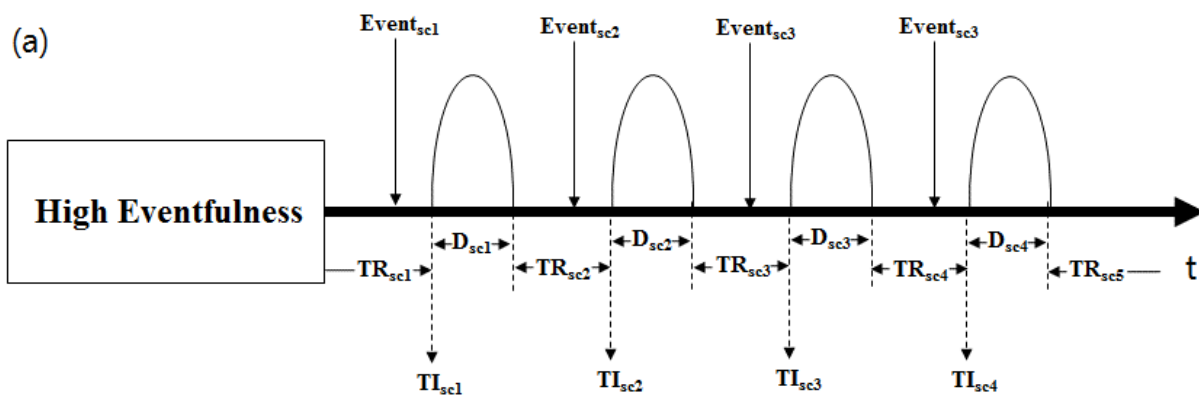
influence the formation of group behaviors. The authors examined the behaviors of software development teams and found that one team working for a Japanese client completed tasks on time to meet deadlines because the Japanese client strictly adhered to keeping the date punctually. Whereas, the other team working for a US client was sometimes behind schedule and did not always observe certain deadlines as the US client was less bounded by time. This study provided evidence that team behavior can speed up or slow down to match its pace with those of external forces. Furthermore, Pérez-Nordtvedt et al. (2008) have theorized the concept at the firm-level and it has been applied to an organizational phenomenon where the temporal patterns of strategic change rapidly assimilate with those of internal and external environments. There are several studies that adopt the concept of organizational entrainment as a main theoretical construct in different contexts (e.g., Khavul et al., 2010; Shi & Prescott, 2012; Pérez-Nordtvedt et al., 2014).

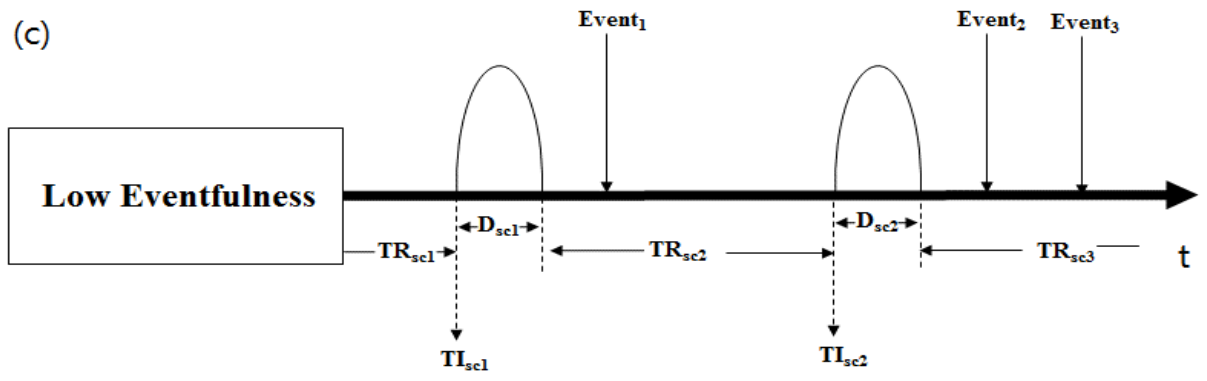
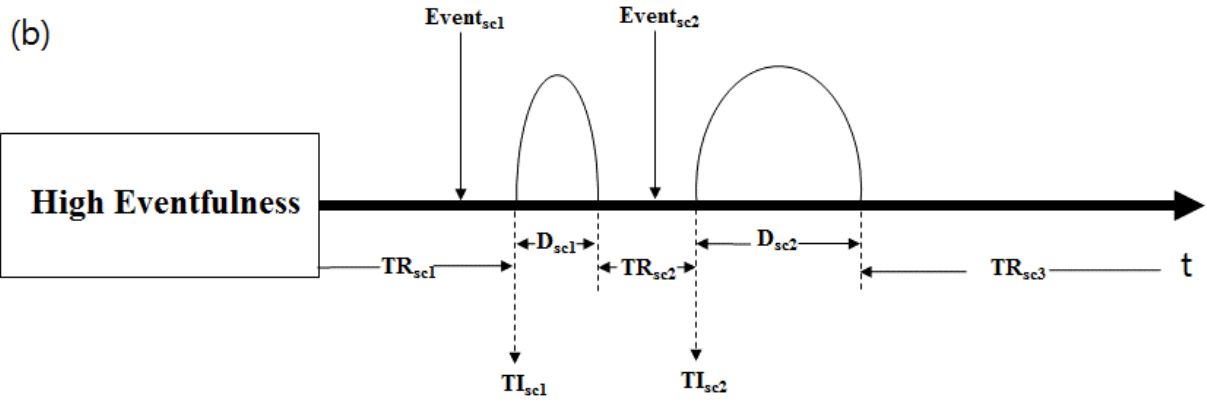
Pérez-Nordtvedt et al. (2008) presented five key assumptions to develop an explicit definition of organizational entrainment. Among the five assumptions, I point out the third and the fifth which seem to be beneficial to building my theoretical construct. According to this study, the third assumption is that “the organizational entrainment process is a strategic choice [this is because] the ability to entrain or resist entraining to such forces may differ from one context to the next” (Pérez-Nordtvedt et al., 2008: 788). The statement implies that the concept of organizational entrainment is not a natural phenomenon but one where the firm intentionally embraces it as a temporal strategy to be responsive to internal or external changes. Next, the fifth assumption is that “[r]hythms require multiple cycles to occur for a pattern to appear. This largely depends on the regularity of zeitgeber [i.e., external time giver] cycles and how they are perceived and measured” (Pérez-Nordtvedt et al., 2008: 788). Zeitgeber cycles can be the regular

patterns of dominant customers, suppliers, government, or competitors that hugely influence a firm's consecutive strategic changes (Pérez-Nordtvedt et al., 2008). But, the patterns of zeitgebers can also be irregular as discussed by Pérez-Nordtvedt et al. (2014) in their example of the Dallas Cowboy's stadium schedule. In all, drawing on these assumptions and prior studies, I define eventfulness in strategic change as the degree to which the firm initiates strategic changes as a response to events - external, internal, or both - such that when eventfulness is high the firm initiates strategic changes every time there is an event. Low eventfulness would be observed when strategic changes are initiated independently from events. In the time continuum, eventfulness can be observed as jolts or skips of strategic changes with no predictable pattern or as very regular occurrences as events - whether internal or external - can either be regular, irregular or both in their occurrence. Figure 4 depicts eventfulness in strategic change.

Figure 4

Eventfulness in Strategic Change Mapped into the Time Continuum





Where,  
 $TI_{scn}$  = Timing of strategic change n  
 $D_{scn}$  = Duration of strategic change n  
 $TR_{scn}$  = Transition before strategic change n  
 $Event_{scn}$  = External or internal event triggering strategic change n  
 $t$  = time

As shown in Figure 4 (a) and (b), when firms have high levels of eventfulness in strategic change, consecutive strategic changes are initiated soon after there is an event. Such event can either be internal or external. Both graphs show that the firm entrains to the event regardless of whether the event occurs regularly or irregularly. In Figure (a), because events occur in a regular way, the transitions and durations of consecutive strategic changes would be roughly equal in

temporal distance (i.e.,  $TR_{sc1} = TR_{sc2} = TR_{sc3} = TR_{sc4} = TR_{sc5}$  and  $D_{sc1} = D_{sc2} = D_{sc3} = D_{sc4}$ , respectively). In Figure 4 (b), on the other hand, even though eventfulness is high, because events occur irregularly, the firm would initiate strategic changes in an irregular pattern. In Figure 4 (b), neither transitions nor durations would be even (i.e.,  $TR_{sc1} \neq TR_{sc2} \neq TR_{sc3}$ , and  $D_{sc1} \neq D_{sc2}$ , respectively). Both Figure (a) and (b) together suggest that eventfulness represents a skip in the patterns of strategic changes that is determined only by the events that trigger them. It is also important to note that each event does not need to be carried out by the same zeitgeber. For instance, in Figure 4 (a),  $Event_{sc1}$  could be a change in the firm's regulatory environment, while  $Event_{sc2}$  can be a change in the buying patterns of the firm's customers. Similarly, a firm with high levels of eventfulness in its strategic changes may have multiple zeitgebers (Pérez-Nordtvedt et al., 2008), and therefore could have some events that occur regularly and others that occur irregularly. Firms may also decide to respond to only certain zeitgebers and not others. In other words, Figure 4 (a) and (b) could overlap in the time continuum. Therefore, those firms that have high levels of eventfulness may not have a predictable pattern in the time continuum. Figure (c), shows the case of low eventfulness where the firm does not initiate strategic changes in response to when external or internal events take place.

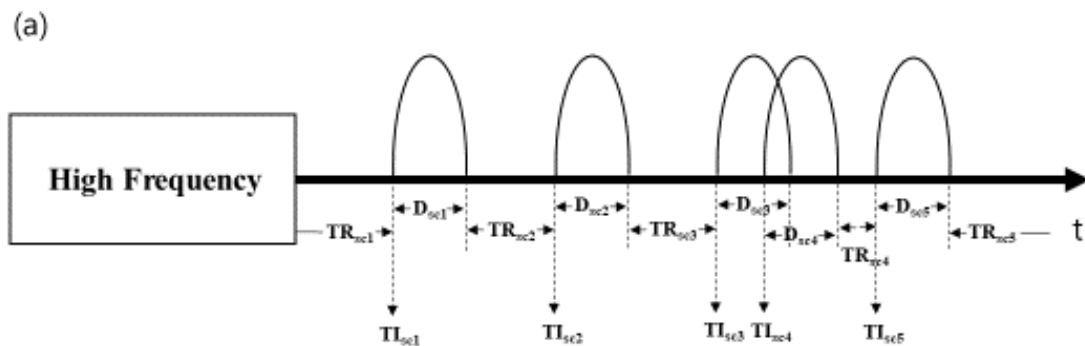


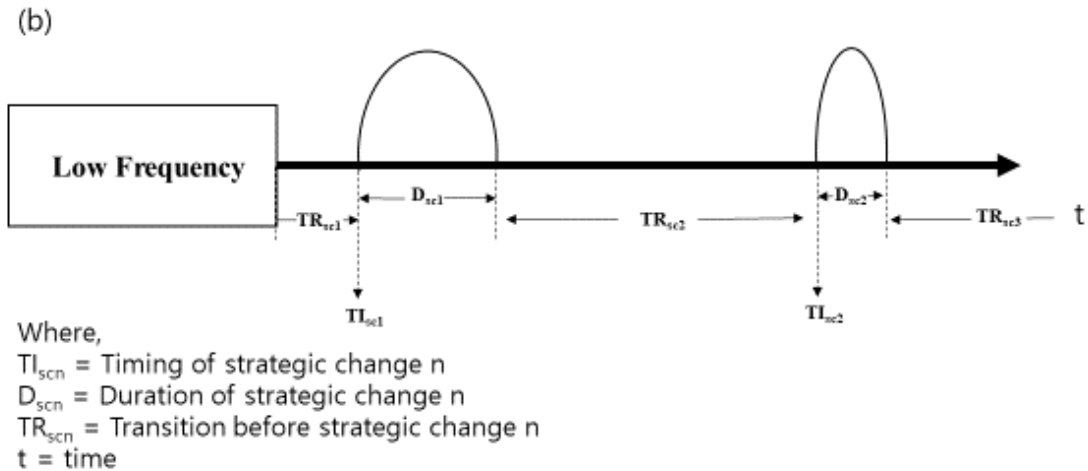
### 2.3.5 Frequency in Strategic Change

Another time-dimension that describes a rhythmic pattern of strategic change is frequency. Although frequency often refers to the speed of strategic changes (Hashai et al., 2018; Shi, Sun, & Prescott, 2012; Vermeulen & Barkema, 2002), it essentially indicates the number of changes in a certain period of time (Klarner & Raisch, 2013; Kunisch, et al., 2017). Thus, I define frequency in strategic change as how often a series of strategic changes are made within a specific time frame such that a high frequency will display a higher number of strategic change execution timings occurring in the time continuum within a specific time frame. Figure 5 exhibits frequency in strategic change in the time continuum.

Figure 5

Frequency in Strategic Change Mapped into the Time Continuum





As shown in Figure 5, I depict frequency in strategic changes using the two extremes of the frequency dimension: a high frequency and a low frequency. As with the two previous dimensions, I intentionally separate it in order to easily capture its intrinsic meaning and compare these two even though the concept of frequency does not discontinuously lie in the time continuum. I suggest that the level of frequency is determined by comparing the number of a focal firm's strategic changes with that of its competitors' strategic changes in the same period of time. To be more specific, in Figure 5 (a), the number of timings in implementing strategic changes are five (i.e.,  $TI_{sc1}$ ,  $TI_{sc2}$ ,  $TI_{sc3}$ ,  $TI_{sc4}$ , and  $TI_{sc5}$ ), which I describe as high frequency. Comparably, in Figure 5 (b), the number of timings is two (i.e.,  $TI_{sc1}$ , and  $TI_{sc2}$ ) and I describe this example as low frequency. Importantly, the determinant of frequency centers on the rate at which subsequent strategic changes are implemented (i.e., timings), and not on whether the durations and transitions of each consecutive strategic change are of equal length in temporal distance.

Regarding frequency in strategic change, existing studies shed light on the antecedents and consequences of frequent strategic changes in various empirical contexts. The empirical

contexts include strategic alliances (Hashai et al., 2018), organizational transitions (Miller & Friesen, 1980), mergers and acquisition (Amburgey & Miner 1992; Nadolska & Barkema 2007; Laamanen & Keil, 2008), international expansion (Casillas & Moreno-Menendez, 2014; Vermeulen & Barkema, 2002), and diversification and refocusing, withdrawal from an international market or a business segment (Bergh & Lim, 2008; Chang 1996; Klarner & Raisch, 2013). In analyzing the antecedents of frequent strategic changes, research relies on different types of experiences that influence the number of strategic changes (Kunisch et al., 2017). Nadolska and Barkema (2007), for example, suggested that the total number of experiences in the foreign acquisition, domestic acquisition, and international joint ventures increases the yearly number of foreign acquisitions. The theoretical rationale for a high frequency is grounded in the fact that prior experiences develop routines that help to reduce cognitive effort and time spent in executing in the change. Indeed, they found support for the positive relationship between foreign and domestic acquisition experience and the number of subsequent foreign acquisitions per year but not for joint venture experience. Their results are consistent with earlier findings that suggest that prior experience with an acquisition type reinforces the rate of the same type of acquisition (Amburgey & Miner, 1992). Overall, even though the types of experience vary according to the context, a general consensus is that previous experience with a specific kind of strategic change enhances a firm's capacity to increase the frequency of those kinds of strategic changes (Bergh & Lim, 2008; Chang, 1996; Miller & Friesen, 1980).

The firm performance implications of frequent strategic changes has been of interest to strategy scholars as well. A number of studies propose that frequent strategic change and firm performance have a curvilinear relationship where the frequency in the execution of strategic changes enhances firm performance up to a certain point (Hashai et al., 2018; Klarner & Raisch,

2013; Vermeulen & Barkema, 2002). Although the right balance in the number of consecutive strategic changes plays an important role in higher firm performance, there are some interesting studies proposing different perspectives. Some studies advocate for a negative relationship between frequent strategic changes and firm performance (Laamanen & Keil, 2008). Laamanen and Keil, (2008), for example, found that a high acquisition rate decreases firm performance because sufficient time is required to fully build acquisition capabilities. As the integration of prior experiences and codification of knowledge take much effort, successive acquisitions at a high frequency rate tend to hamper the establishment of effective acquisition capabilities (Laamanen & Keil, 2008). In contrast, some studies contend that there is a positive relationship between frequent strategic changes and firm performance. According to Shin and Pérez-Nordtvedt (2018), in high velocity environments, making strategic changes at a high rate can be a source of competitive advantage. In general, there has not been a consensus on the performance implications of frequent strategic changes on firm performance.

### **2.3.6 Acceleration in Strategic Change**

Acceleration, albeit under-studied, is also one of the distinctive time-dimensions describing a rhythmic pattern of strategic change. In the literature, speed, pace, and rapidity have gained a central position (Albert, 2013; Baum & Wally, 2003; Eisenhardt, 1989; Forbes, 2005; Khavul et al., 2010). However, despite prior efforts, most studies dealing with speed as a main theoretical construct have failed to distinguish between speed (i.e., the temporal distance between the timings of consecutive strategic changes) and the rate of change of speed over time. In physics, the speed of an object is the rate of change of its position, which indicates the magnitude of the object's velocity (Brown, 1993). On the other hand, the rate of change of speed

means changing the magnitude of the object's velocity (Brown, 1993). This concept is known as acceleration. A typical example to distinguish between the two time-dimensions is the driving of a car. When one drives a car, the car can run at a constant speed, which can be maintained, for instance, by using cruise control. However, one can change the speed of the car by speeding up and slowing down. The car does not always need to maintain the same speed as one can accelerate or decelerate. Also, the car could potentially keep its speed constant, in which case acceleration would be equal to zero.

Yet, despite the difference in character between the two time-dimensions (i.e. speed vs. acceleration), it is surprising that most extant studies do not explicitly incorporate the concept of acceleration. For example, in the internationalization literature, the acceleration label has been used to explain the nature of born-global firms (Oviatt & McDougall, 2005; Shrader, Oviatt & McDougall, 2000). However, this literature simply suggests that some firms have accelerated their internationalization by having their first international commitment occur earlier in their organizational life cycles, which literally indicates the timing of a single strategic change (e.g., Shrader et al., 2000). Moreover, Johanson and Kalinic, (2016) noted that most studies of internationalization regard the rate of change of speed to be consistent or steady throughout the process. The literature on innovation is another research stream that often uses the label of acceleration or radical speed to describe technological, administrative, and process innovation (Ettlie, Bridges, & Okeefe 1984; Kessler & Chakrabarti, 1996; Mansfield, 1988; Murmann, 1994; Vesey, 1991; Zhou & Li, 2012). Nonetheless, and similarly to the internationalization research, many of these studies do not precisely reflect the meaning of change in speed in physics as they focus on a single event and process (e.g., Ali, Krapfel, & Labahn, 1995; Birnbaum-More, 1993; Clark & Fujimoto, 1991; Gee 1978, Keller 1986;1994). To illustrate,

Kessler and Chakrabarti (1996: 1144) reviewed existing studies of product innovation and discussed that “the concept of innovation speed refers to accelerating activities from first spark to final product, including activities that occur throughout the product-development process.” In the discussion, the temporal distance from the inception to new product introduction means just the duration of a single strategic change. Thus, it provides evidence that these studies do not explicitly measure changing speeds, but rather speed per se.

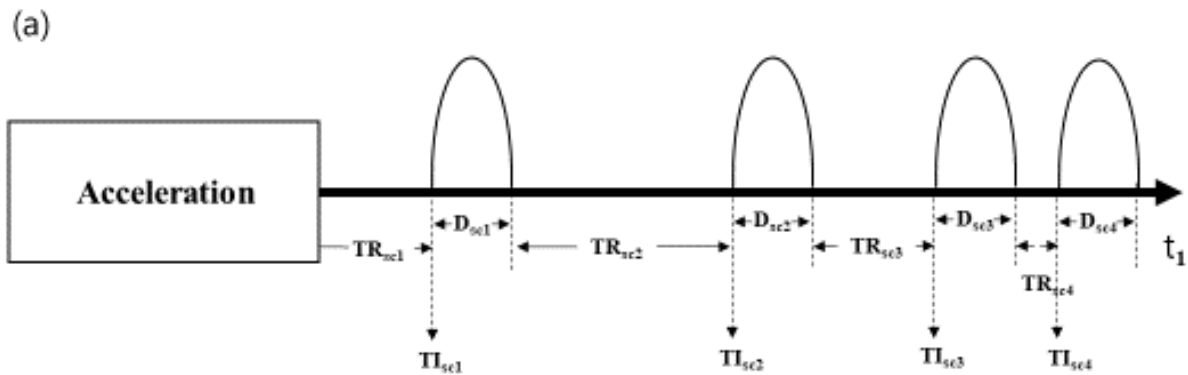
There are a few studies that accurately adopt the physical meaning of acceleration in their context (i.e., Johanson & Kalinic, 2016; Perlow et al., 2002). Perlow et al. (2002), for instance, investigated how a focus on accelerating decision-making speed affected organizational processes and firm performance. By drawing from a case of an internet venture throughout its entire 19-month lifespan, the authors observed that the speed of strategic decision-making was accelerated during its lifespan. Because the new venture had a successful experience with fast decision-making at the beginning, decision makers had the illusion that making ever-faster decisions was necessary to survive. Similarly, Johanson and Kalinic (2016) did a study of acceleration by observing two cases of small-sized Italian firms in the manufacturing sector over 16 years and 22 years. Both firms illustrated that they accelerated the speed of foreign market expansion in terms the number of foreign markets entered at the beginning. However, one firm decelerated the number of international markets entered after 6 years from inception while the other one did it after 9 years. From these observations, they provided new insights into the dynamic patterns of the internationalization process.

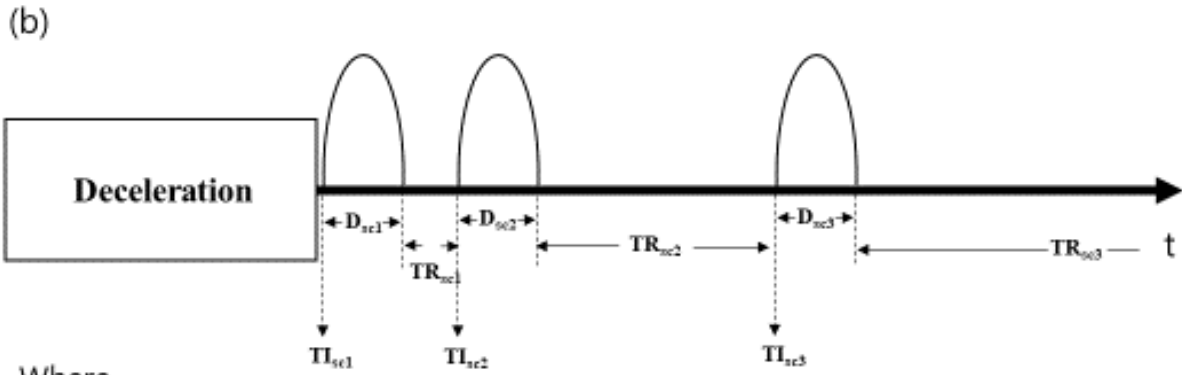
Given that the use of the term acceleration has not been consistent across studies, and that only a few have used it properly, in this section, I formally conceptualize acceleration as a separate dimension from speed in order to be aligned with the definition of the rate of change of

speed in physics. By doing so, I extend the scope of existing studies, moving beyond speed to consider non-linearity of speed in strategic changes. As I mentioned above, in physics, the speed of an object can vary. Thus, I define acceleration in strategic change as the rate of change of speed in a series of strategic changes in a specific time frame such that high acceleration is observed when the transitions of each consecutive strategic change in the time continuum get shorter and shorter in temporal distance. In proposing a systematic view of acceleration, I suggest that the rate of change of speed can increase as is the case in acceleration, or it can decrease as is the case in deceleration. Graphically, Figure 6 illustrates the acceleration dimension in strategic change in the time continuum.

Figure 6

Acceleration in Strategic Change Mapped into the Time Continuum





Where,  
 $TI_{scn}$  = Timing of strategic change n  
 $D_{scn}$  = Duration of strategic change n  
 $TR_{scn}$  = Transition before strategic change n  
 $t$  = time

Figure 6 (a) shows the instance of acceleration. Acceleration occurs when transitions become shorter and shorter in temporal distance (i.e.,  $TR_{sc1} > TR_{sc2} > TR_{sc3} > TR_{sc4}$ ). Conversely, as shown in Figure 6 (b), deceleration occurs when transitions become longer in temporal distance (i.e.,  $TR_{sc1} < TR_{sc2} < TR_{sc3}$ ). In sum, as speed and acceleration in strategic change are two different time-dimensions, I suggest that scholars should explicitly consider whether consecutive strategic changes are implemented at an increasing or decreasing rate in a given time frame. Furthermore, the rate of change of speed can be a non-linear and irregular process. That is, acceleration in strategic change does not always follow a gradual and even increase or decrease but can be punctuated or can fluctuate up and down.



### 2.3.7 Polychronicity in Strategic Change

The last time-dimension that describes a rhythmic pattern of strategic change is polychronicity. Due to the fact that the concept of polychronicity is theoretically underdeveloped at the firm-level, I first address how the concept of polychronicity was initiated. Then, I discuss extant research on polychronicity. Finally, I propose it for firm-level strategic change.

Hall (1959; 1983), in the field of anthropology, introduced the concept of polychronicity from his observation that individuals exhibit differences in prioritizing human relationships over task accomplishment. Since the genesis of the concept, polychronicity has been defined as the extent to which people in a culture prefer to engage in multiple tasks at the same time and believe that this is the best way to do things (Bluedorn, 2002; Bluedorn, Kalliath, Strube, & Matin, 1999; Bluedorn, Kaufman, & Lane, 1992; Hall, 1959, 1983; Souitaris & Maestro, 2010). As such, a person who is polychronic tends to initiate and perform various tasks together by, for instance, reading a newspaper and watching television while carrying out a conversation (Bluedorn et al., 1992). On the contrary to this, a monochronic or less polychronic person tends to sequentially perform single tasks at a time (Bluedorn et al., 1999). In this vein, Bluedorn et al. (1999) developed a sound measure of the polychronicity construct as a dimension of organizational culture by sampling various types of organizations, 11 samples that totaled 2,190 respondents.

Even though the concept of polychronicity has been mainly applied to the individual (e.g., Kaufman-Scarborough, & Lindquist, 1999) and group levels of analysis (e.g., Bluedorn et al., 1999; Slocombe & Bluedorn, 1999), some studies, even if the concept is not explicitly stated, emphasize the importance of polychronicity to address and understand organizational phenomena (Brown & Eisenhardt, 1997; Eisenhardt, 1989; Judge & Miller, 1991; McCollum &

Sherman 1999). Eisenhardt (1989), for example, found that simultaneous consideration of various alternatives among top executives led to a faster decision-making process in the high-velocity industry of microcomputers. Brown and Eisenhardt (1997) subsequently investigated how a successful firm effectively manages multiple product innovations to achieve a competitive position in the high-tech market. Again, while these two studies do not explicitly incorporate the concept of polychronicity to conceptualize their arguments, they are evaluating the importance of performing particular activities at the same time.

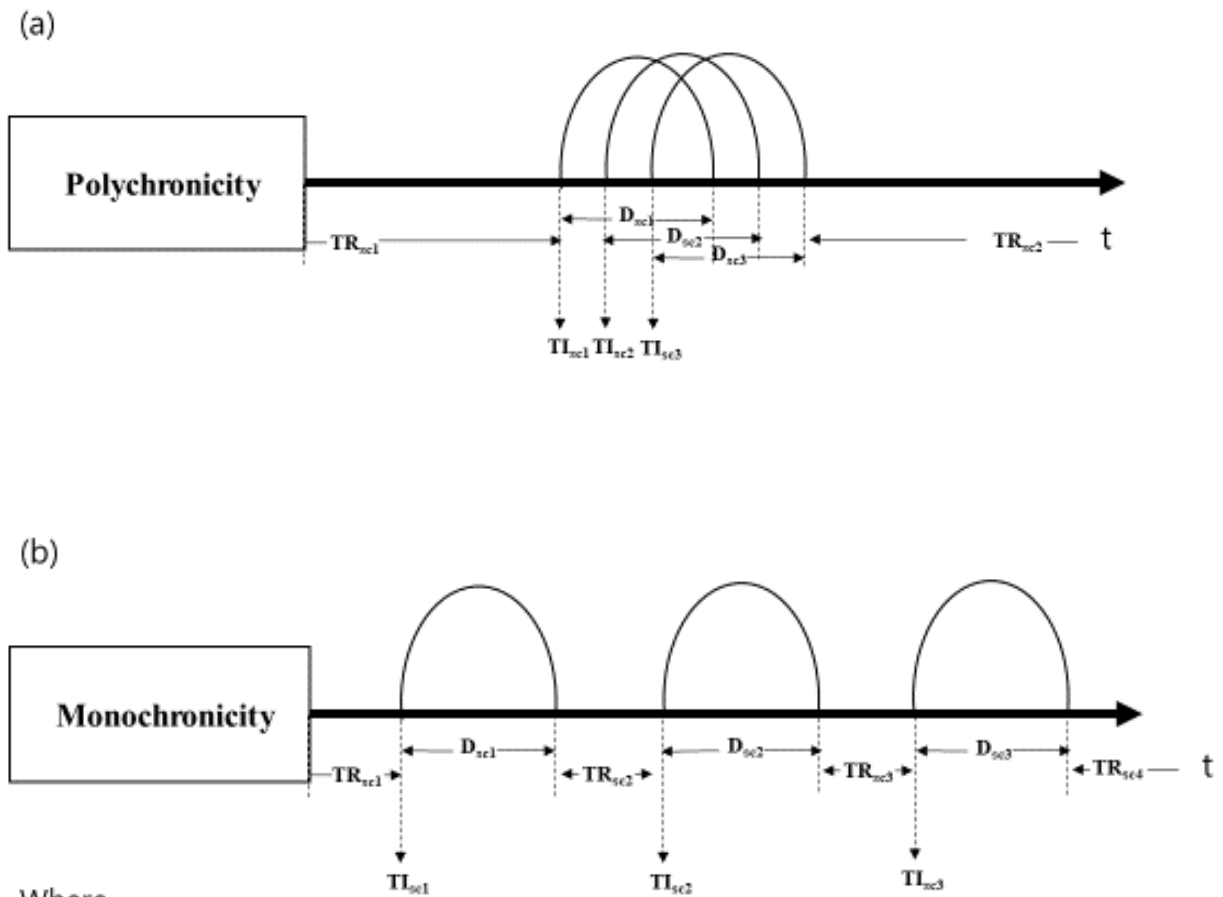
There is one study that introduces the concept of polychronicity to strategic research by applying it to top management teams (TMTs) (i.e., Souitaris & Maestro, 2010). According to the study, TMT polychronicity is an important concept because it helps to understand how top executives allocate their own time, the most valuable resource, in strategic decision-making processes. Souitaris and Maestro (2010) empirically examined how the multitasking behavioral tendency of top executives affects strategic decision-making processes and firm performance. However, they failed to directly assess TMTs' actual polychronic behaviors. Instead, they measured the polychronic culture of an organization (e.g., we believe people should try to do many things at the same time) as an implicit assumption to predict and expect actual firm behavior. Even though the study had methodological limitations, the study, to the best of my knowledge, is the first and last attempt to theorize and test the concept of polychronicity at the firm-level.

The application of polychronicity, so far, has been limited to the explanation of human behavior at the individual and group levels. To facilitate the use of polychronicity at the firm-level, I provide the definition of polychronicity in strategic change as the degree to which a series of consecutive strategic changes overlap in a specific time frame as opposed to are done

sequentially such that high polychronicity will display no transitions between each consecutive strategic change in the time continuum, and low polychronicity will display clear transitions between each consecutive strategic change. This definition allows this study to examine actual firm behavior over time. The illustration of polychronicity is presented in Figure 7.

Figure 7

Polychronicity in Strategic Change Mapped into the Time Continuum



Where,  
 $TI_{scn}$  = Timing of strategic change n  
 $D_{scn}$  = Duration of strategic change n  
 $TR_{scn}$  = Transition before strategic change n  
 $t$  = time

Let's say that there are two firms implementing key strategic changes. Figure 7 (a) exhibits polychronic strategic change under which the firm initiates a subsequent strategic change (i.e.,  $TI_{sc2}$ ) while still working on the first one (i.e.,  $TI_{sc1}$ ). Further, although the first and second strategic changes are still in progress, the firm also begins with the other strategic change (i.e.,  $TI_{sc3}$ ), and so forth. In other words, there are no transition periods between each consecutive strategic change under this situation. By contrast, Figure 7 (b) depicts monochronic strategic change where the firm does not initiate a second strategic change (i.e.,  $TI_{sc2}$ ) until it finishes the first strategic change (i.e.,  $D_{sc1}$ ). This means that the firm does not start subsequent strategic change unless it completes an ongoing strategic change. Thus, such firm clearly shows transitions between each consecutive strategic change (i.e.,  $TR_{sc2}$ , and  $TR_{sc3}$ ) and the durations of a series of strategic changes (i.e.,  $D_{sc1}$ ,  $D_{sc2}$ , and  $D_{sc3}$ ) are never overlapping.

So far, based on the literature review on the objective interpretation of time, I have developed five time-dimensions in strategic change. Next, I will discuss the subjective interpretation of time.

### **2.3.8 Linearity in Strategic Change**

The subjective interpretation of time, referred to as the temporal experience of time in strategic changes occurring over time, is the other highest-order time-dimension as presented in Table 1. Unlike the objective interpretation of time, the subjective interpretation of time cannot map strategic changes into the time continuum. Rather, it considers if the past, the present, and the future are closely intertwined in the content of consecutive strategic changes (George & Jones, 2000). Indeed, Cunha (2004) discussed that depending on whether or not time is perceived to advance with novelty, it is typically categorized as either linear time or cyclical time.

However, while previous literature has considered linear and cyclical experiences of time as opposing interpretations, I suggest that each one of these is a separate dimension of subjective time and can therefore co-exist. The subjective interpretation of time contains two important time-dimensions at the lower-order, linearity and cyclicity in strategic change.

Crossan et al. (2005) posit that time as a linear phenomenon is different from the past. The concept of linear time in strategic change implies that managers limit the use of the past to implement consecutive strategic changes because entirely relying on the past may deteriorate the future (Cunha, 2004). Thus, this time perspective influences subsequent strategic changes to be out of box (Crossan et al., 2005; Cunha, 2004). As organizations view time through a linear lens, they do not revisit their past experiences. These organizations tend to implement different types of strategic alliances, joint ventures, international commitments, product/service developments, etc, over time.

The linear time perspective has been applied to the strategic planning process. One stream of research argues that formal strategic planning process, following historical practices meticulously, does not guarantee ideal strategies (Mintzberg, 1990, 1994). This is because intended strategies rarely survive and often fail to maintain their original form (Mintzberg & Waters, 1985). Instead, realized strategies are the combination of both *deliberate* and *emergent* strategies to be aligned with environmental changes (Mintzberg & Waters, 1985). In this vein, Mintzberg, (1994: 109) explained the linear time perspective in strategic change in that the “[formal strategic process], by its very analytical nature, has been and always will be dependent on the preservation and rearrangement of established categories – the existing levels of strategy (corporate, business, functional), the established types of products (defined as “strategic business units”), overlaid on the current units of structure (divisions, departments, etc.). But real strategic

change requires not merely rearranging the established categories, but inventing new ones.”

Likewise, under the concept of linear time, firms implement newly developed strategies, which are different from the past, as managers have a discontinuous association among the past, present, and future. Therefore, based on previous work, I define linearity in strategic change as the degree to which current strategic changes are different from previous strategic changes and will be different from future strategic changes such that consecutive strategic changes over time are novel, unique, and out of the box. The linearity experience of time in strategic changes relies on creativity, innovation and exploratory approaches in the execution of consecutive strategic changes occurring over time.

### **2.3.9 Cyclicity in Strategic Change**

Time in the subjective sense can be considered as cyclical phenomena, such that the past is a good guide to the future (Crossan et al., 2005; Cunha, 2004). This holds true especially when current strategic change is mainly grounded in previous routines and solutions that a firm has already experienced in the past. Consequently, firms implement similar types of strategic changes over again. Based on prior studies, I define cyclicity in strategic change as the degree to which past strategic changes reappear in current and future strategic changes such that consecutive strategic changes are grounded on learning and forecasting by extrapolating the past into the future.

Mintzberg (1990) criticized strategic planning process under the cyclical time perspective in that the process does not allow for an emergent strategy to arise as it strictly manages each phase in a consecutive order. Yet, he overlooked the fact that the repetition of the past can make organizations more efficient because it promotes a sense of legitimacy among managers along

with their norms, values, beliefs, and definitions (Suchman, 1995). In fact, Andrews (1987), in his book of *Concept of Corporate Strategy*, considered an emergent strategy as *opportunism* and the *enemy*. He wrote, “a strategy may suddenly be rationalized to mean something very different from what was originally intended because of the opportunism which at the beginning of this book we declared the conceptual enemy of strategy” (Andrews, 1987: 828-829). Likewise, one stream of research believes that the present and the future should be closely intertwined with the past for a firm’s success (e.g., Ansoff 1965; Cooper & Kleinschmidt 1987; Sinha 1990).

The concept of cyclicity has been adopted to explain a firm’s behavior to forecast the future (Crossan et al., 2005). This is because forecasting is closely aligned with a perception that the business environment has predictable cycles, such as the political election cycle, the harvest time cycle, and the employment cycle (Crossan et al., 2005). Ansoff (1965) suggests that firms should forecast the future with a given accuracy, which is one of the essential conditions for an elaborate strategy. In support of this view, Clark (1978) uncovered chronological interdependence between sugar beet production and its natural environmental cycle, which repeats yearly. Arguably, many external environmental events repeat over time. As such, under the cyclicity concept, the firm relies on learning from the past, developing organizational memory and forecasting the past by extrapolating it into the future.

Some may argue that cyclicity in strategic change seems to be identical to path dependence theory because the basic notion of path dependence also describes the use of repetitive historical practices (Nelson & Winter, 1982; Powell, 1991). However, cyclical time is distinct from path dependence theory in terms of efficiency. Path dependence theory explains how the set of current decisions available is restricted to past events that one has already experienced (Powell, 1991). These change decisions indicate that organizational practices,

activities, and decisions are *locked in* although better alternatives could be available (Powell, 1991). The current dominance of the QWERTY keyboard format could be a good example as David (1985) stated that inferior standards can persist simply due to their inheritance. Thus, under path dependence theory, firms tend to be stereotyped with what they used to do (e.g., David, 1985; Arthur, 1990) because institutional arrangements can incur high reversal costs (Levi, 1997). On the other hand, cyclical time implies that firms repeat their historical strategic changes because they believe these are the better way to achieve a competitive position (e.g., Barkema & Schijven, 2008; Gulati & Gargiulo, 1999). Thus, even though both theories explain the persistence of initially formed patterns, practices, plans, decisions, and strategies, the motivation of an action is not the same in these two perspectives. Path dependency theory emphasizes the past as it is the most familiar, whereas cyclical time of strategic changes focuses on the past as that is where the firm sees maximum benefits to exist.

In this chapter, I have reviewed the objective interpretation of time and the subjective interpretation of time in strategic change. The objective interpretation of time consists of a single strategic change and a series of strategic changes that can be mapped into the time continuum. When a series of strategic changes in the time continuum exist, one can observe five different time-dimensions describing various rhythmic patterns in strategic change. On the other hand, the subjective interpretation of time contains two different time-dimensions that describe the experience of time in strategic change. In the next chapter, I develop hypotheses that link these time-dimensions to firm performance.



## CHAPTER 3

### HYPOTHESES DEVELOPMENT

Various time-dimensions play important roles in the survival and the growth of firms (Bluedorn & Denhardt, 1988). Thus, in this chapter, I begin examining direct relationships between regularity and eventfulness in strategic change and firm performance. I then address how regularity and eventfulness interplay to have a synergistic effect on firm performance. Next, I discuss how frequency and acceleration in strategic change, respectively, affect firm performance. Moreover, the moderating effect of acceleration and frequency on firm performance are also examined. Then, I examine how polychronicity in strategic change affects firm performance. Next, the direct relationships between linearity and cyclicity in strategic change and firm performance are examined. Finally, I discuss the interaction effect between linearity and cyclicity on firm performance.

#### **3.1 Regularity in Strategic Change and Firm Performance**

As discussed in Chapter 2, I defined regularity in strategic change as the degree to which a series of strategic changes are made on a consistent basis in a specific time frame such that, in high regularity cases, transitions and durations between each consecutive strategic change in the time continuum are relatively equal in temporal distance. In this regard, several studies have addressed effective rhythmic patterns in strategic change to achieve a competitive advantage (Brown & Eisenhardt, 1997; Hashiai et al., 2017; Hayward, 2002; Klarner & Raisch, 2013; Laamanen & Keil, 2008; Vermeulen & Barkema, 2002). For instance, Vermeulen and Barkema

(2002) examined how foreign market expansion on a consistent basis affected a focal firms' financial performance. They found that those firms that regularly established their foreign presence were associated with higher firm performance than those that had an irregular pattern in their foreign expansion. In general, prior studies contend that firms with regular strategic change in the context of a series of acquisitions (Hayward, 2002; Laamanen & Keil, 2008), consecutive international commitments (Hashiai et al., 2017; Vermeulen & Barkema, 2002), new product development cycles (Brown & Eisenhardt, 1997), and business domain alternations over time (Klarner & Raisch, 2013) are associated with higher firm performance.

The underlying theoretical reasons of enhanced firm performance center around three distinctive rationales: the development of absorptive capacity (Vermeulen & Barkema, 2002), the enhancement in the management of transitions (Brown & Eisenhardt, 1997), and the establishment of change routines (Klarner & Raisch, 2013). I will discuss each in turn. First, the extent to which firms achieve benefits in future endeavors is attributed to their capacity to absorb prior experiences (Cohen & Levinthal, 1989). On the one hand, punctuated or irregular strategic change, where firms rarely make strategic changes, reduce their absorptive capacity because firms gradually forget knowledge obtained from their previous experiences (Hayward, 2002; Vermeulen & Barkema, 2002). On the other hand, firms that regularly engage in strategic changes are more likely to learn from their experiences and develop their absorptive capacity making them better able to deal with future strategic changes.

Second, regularity in strategic change allows firms to carefully manage the transition between current strategic changes and future ones (Brown & Eisenhardt, 1997). Brown and Eisenhardt's (1997) qualitative data revealed that those firms with unsuccessful product portfolios were not able to smoothly link current and future projects. They found that under

irregular strategic change, transition periods are not even but an afterthought, which eventually delays product development cycles. In contrast, successful firms smoothly switched from one project to the next with a predictable transition period between the two (Brown & Eisenhardt, 1997). This managed transition allows organizational members to maintain an effective work pace and to have a sense of control even in chaos (Eisenhardt & Brown, 1998).

Lastly, regularity in strategic change helps firms to overcome their own organizational inertia (Hannan & Freeman, 1984), which may lock these firms in conventional and inefficient routines (Klarner & Raisch, 2013). By making intended strategic changes on a regular basis with even durations, timings and transition periods, firms may systematically build routines for change (Klarner & Raisch, 2013). Overall, prior studies posit that regularity in strategic change enhances firm performance. Thus, my first proposition suggests that:

*Hypothesis 1: Regularity in strategic change has a positive effect on firm performance.*

### **3.2 Eventfulness in Strategic Change and Firm Performance**

Previously, I defined eventfulness in strategic change as the degree to which the firm initiates a series of strategic changes as a response to events - external, internal, or both - such that when eventfulness is high the firm initiates strategic changes every time there is an event. In the time continuum, eventfulness will be observed as jolts or skips of strategic changes with no predictable pattern or as very regular occurrences as events can be regular, irregular or both. In short, eventfulness can be considered a type of strategic flexibility that achieves continuous temporal fit along with internal and external environmental changes (Crossan et al., 2005).

Arguably, strategy scholars have suggested that firms should not be rigidly restricted to a predefined schedule because the heterogeneous patterns in a series of strategic changes can develop a more flexible sense of organizations (Brown & Eisenhardt, 1998; Crossan et al., 2005; Cunha, 2004; Cunha et al., 1999; Shi & Prescott, 2012). A fixed schedule may fail to cope with situations where unexpected events occur. This is because scheduling is subject to considerable uncertainty from various possible sources, such as resource unavailability, changes in deadlines, and fluctuating weather conditions. Instead, a firm must strive for flexibility in organizational scheduling because it may help the firm to be entrained with major changes that open windows of opportunity.

Indeed, regarding the performance implications of temporal adaptation, prior studies have advocated the positive association between temporal fit and firm performance (Khavul et al., 2010; Pérez-Nordtvedt et al., 2008; Pérez-Nordtvedt et al., 2014; Shi & Prescott, 2012). The central argument of organizational entrainment is that once a firm matches its pace of strategic changes with temporal changes occurring in their internal and external environments, the firm achieves optimal performance (Pérez-Nordtvedt et al., 2008). If the firm fails to do so, the temporal misfit generated leads to inefficiency, suboptimal performance, or potential firm death (Pérez-Nordtvedt et al., 2008). In particular, there are some studies that examine how temporal fit serves as a viable strategy to disruptions from external environments. For instance, Khavul et al. (2010) brought the concept of organizational entrainment to the literature on international entrepreneurship. With a multi-country sample of 166 international new ventures, they found that the effect of the degree and the scope of internationalization on the performance of new ventures was enhanced when these new ventures were entrained to the requirements of their main international customers. Also, Shi and Prescott (2012) found support for the argument that

organizations that synchronized their patterns of acquisitions and alliances to those of competitors ultimately achieved higher firm performance. Therefore, on that basis, I contend that eventfulness in strategic change enhances firm performance as a flexible schedule allows firms to implement subsequent strategic changes in response to meaningful events in the internal and external environments. As such, I expect that:

*Hypothesis 2: Eventfulness in strategic change has a positive effect on firm performance.*

Aside from their independent effects on firm performance, regularity and eventfulness in strategic change, I argue, have a positive, synergistic effect on firm performance. I suggest that firms that are both regular and eventful in the execution of their strategic changes will enjoy superior performance than firms which only preempt their strategic changes or enact their strategic changes in response to external/internal events. As Table 2 shows, I propose a 2X2 matrix that suggests the interplay between regularity and eventfulness in strategic change.

Table 2 illustrates four extreme scenarios. In quadrant (a) in Table 2, the firm is in a situation where the pattern of strategic changes is neither regular nor eventful. Thus, firms in this scenario irregularly implement strategic changes over time and do not make strategic changes when events take place. Firms in quadrant (a) experience low firm performance. Quadrant (b) in Table 2 depict situations where firms have regularity in strategic change and quadrant (c) in Table 2 show situations where firms display eventfulness in strategic change. As explained in Hypotheses 1 and 2, these firms should have superior firm performance, especially when compare to firms in quadrant (a) in Table 2. Firms in quadrant (d) in Table 2 have a strategic

change pattern that is both regular and eventful. These firms enjoy greater performance than those in quadrants (a)-(c) in Table 2.

Table 2  
 Regularity and Eventfulness in Strategic Change and Performance Implications

		<i>Regularity</i>	
		Low	High
<i>Eventfulness</i>	Low	(a) Firm makes irregular strategic changes and does not make strategic changes when internal or external events occur Below average performance due to lack of preemptive and entrainment effects	(b) Firm makes strategic changes solely on a pre-planned schedule Above average performance due to enhanced transition management, superior absorptive capacity and embedded routines for change
	High	(c) Firm makes strategic changes solely when internal or external events happen Above average performance due to enhanced temporal fit effects and responsiveness	(d) Firm makes strategic changes both on a pre-planned basis and when events happen Superior performance due to superior preemptive and entrainment effects

I suggest that regularity and eventfulness in strategic change positively and jointly impact firm performance for the following reason. Firms that pursue both regularity and eventfulness in their strategic changes benefit from improvisation (Brown & Eisenhardt 1997; Crossan et al., 2005; Moorman & Miner 1998a; Weick 1998b). The concept of improvisation originated from jazz music where a musician composes and performs simultaneously (Kamoche & Cunha, 2001).

Since the genesis of the concept, it has gained recognition as a temporal strategy and has been applied to the field of strategic management (Brown & Eisenhardt 1997; Crossan et al., 2005; Cunha 2004; Shi & Prescott, 2012). In essence, the concept, often referred to as “manipulative flexibility” (Crossan et al., 2005), “even-event perception of time” (Cunha, 2004), and “a just-in-time strategy” (Weick 2001b), addresses a firm’s behavior in which firms proactively make consecutive strategic changes to shape their environments while they are responsive to changes in those environments (Crossan et al., 2005). For example, a firm may preemptively implement consecutive strategic changes regularly once every month in a certain year to benefit from improved absorptive capacity, superior transition management and embedded routines for change. In addition, however, the firm may make a few strategic changes during a specific month in the year when there is a change in its task environment to benefit by entraining to its customers. Such firm should enjoy superior performance because it is exploiting the benefits of being proactive and it is also attaining temporal fit. Research suggests that firms that improvise benefit from such improvisation. Shi and Prescott (2012), for instance, empirically found some support for this argument, albeit in a different context. They introduced the concept of *even-event paced rhythm*, which allows time lag in scheduling for repetitive acquisitions to deal with unexpected situations. With 421 observations from 57 firms in the pharmaceutical industry, they generally found support for the idea that the even-event pace of repetitive acquisitions – or in my jargon a regular and eventful pace of repetitive acquisitions - led to higher firm performance compared to either the even or event pace ones. This performance result provides evidence to support my idea that regularity and eventfulness in strategic change together have a positive and synergistic effect on firm performance. Therefore, I hypothesize the following:

*Hypothesis 3: The interaction between regularity in strategic change and eventfulness in strategic change is positively associated with firm performance.*

### **3.3 Frequency in Strategic Change and Firm Performance**

Again, I defined frequency in strategic change as how often a series of strategic changes are made within a specific time frame such that a high frequency will display the higher number of timings in implementing strategic changes in the time continuum. The performance implications of frequency in strategic change have been one of the main research interests among scholars. However, there has not been consensus on the issue of how often consecutive strategic changes need to be made in order to enhance firm performance (Klarner & Raisch, 2013). Some studies advocate that frequent strategic change is positively related to firm performance (Amburgey & Miner, 1992; Shin & Pérez-Nordtvedt, 2018). As is the case with regularity, one main reason for higher firm performance rests on the fact that frequency also weakens organizational inertia and builds routines for change (Klarner & Raisch, 2013). This is because the more often a strategic change is implemented, the better the firm is at changing. Routines for change force firms to keep exploring new knowledge and facilitate their organizational learning over time (Eisenhardt & Martin, 2000). Through the accumulation of a greater body of new knowledge, firms become more effective at executing the next set of strategic changes, leading to better firm performance. The other reason for high firm performance is that frequent strategic change allows a firm to be continuously responsive to changing environments (Shin & Pérez-Nordtvedt, 2018). According to Shin and Pérez-Nordtvedt (2018), frequency in strategic change plays a critical role in industries displaying high-velocity (e.g., the fashion industry). With a sample of 111 small fashion retailers in South Korea, they found support for the idea that a high



frequency of consecutive strategic changes that are made on a regular basis increased firm performance.

However, I question whether or not strategic change frequency always leads to high firm performance. In other words, I question, if frequency matters for improved performance, how frequent should firms implement multiple, consecutive strategic changes in a specific time frame? While a high frequency in strategic change enhance firm performance, such high frequency is also accompanied by certain detrimental pressures (Klarner & Raisch, 2013). Thus, I propose that when the level of frequency in strategic change is very high (i.e., strategic changes are made too often in a certain period of time), firm performance begins to decrease. In other words, I suggest that frequency is beneficial but only to a certain point, at which it starts to become detrimental to firm performance. I identify two theoretical reasons that highlight the drawbacks of excessive frequency in the implementation of strategic changes. These are bounded rationality and increased administrative costs. I discuss each in turn.

First, an overemphasis on frequency creates managerial blind spots, which tend to ignore alternative information sources (Barkema & Schijven, 2008). As suggested by Eisenhardt (1989), successful decision-making requires a great deal of real-time information, advice, and alternative choices. These alternative information sources are the basis of rational decisions (Eisenhardt, 1989). However, at extremely high rates of frequency in the execution of strategic changes, and due to bounded rationality (Simon, 1991), managers may be interrupted in their evaluation of alternative choices and not be able to fully utilize and evaluate the information at hand. Thus, at excessive frequency levels, where information processing goes beyond a manager's capacity to consider multiple sources of information, managerial blind spots will be generated, rational

decision-making will be less effective, and the implementation of consecutive strategic changes will be suboptimal, leading to performance decrements.

Second, a severe high rate of strategic change frequency is also likely to increase overall administrative costs (e.g., wages and benefits to employees, executive compensation, and consulting and legal fees), and thus offset its benefits. I suggest that while change routines help firms overcome organizational inertia (Klarner & Raisch, 2013), changing routines too frequently may be as bad as organizational inertia due to their higher administrative costs. Engagement in the execution of strategic changes is associated with a high amount of managerial time and effort such as developing trust and reputation, analyzing capacity and expected returns, monitoring and encouraging employees and the like (Hashai et al., 2018). Consequently, excessive administrative costs can suppress further profit growth. Grounded in this rationale, I posit that as the rate of frequency in implementing strategic changes increase, so do the administrative costs of strategic change, in such a way that the costs surpass the benefits of strategic changes. In a similar vein, Hashai et al. (2018) studied whether the performance results of the alliance portfolios of firms were derived from the effect of the frequency of alliances on firms' revenues or on firms' administrative costs. They found that as the number of strategic alliances increases over time, administrative costs also disproportionately increase, eventually lowering firm performance after a certain threshold. Overall, I contend that a frequent strategic change enhances firm performance due to the establishment of change routines (Klarner & Raisch, 2013) and the increased responsiveness of the firm to changing environments (Shin & Pérez-Nordtvedt, 2018), but only up to a point. When the frequency of strategic changes becomes severe, and managers' ability to analyze alternative sources of information is hampered (Barkema & Schijven, 2008; Eisenhardt, 1989), the drawbacks of strategic change frequency

outweigh its benefits. Moreover, when administrative costs of strategic change exceed the benefits of such change (Hashai et al., 2018), extreme frequency in strategic change becomes detrimental to firm performance. My argument is consistent with prior empirical findings (e.g., Casillas & Moreno-Menendez, 2014; Hashai et al., 2018; Klarner & Raisch, 2013). Thus:

*Hypothesis 4: The relationship between frequency in strategic change and firm performance is an inverted U-shape.*

### **3.4 Acceleration in Strategic Change and Firm Performance**

Another time-dimension that describes a rhythmic pattern of strategic change is acceleration, which I defined previously as the rate of change of speed in a series strategic changes that occur in a specific time frame. As I stated above, acceleration is observed when, over time, the transitions of each consecutive strategic change get shorter and shorter in temporal distance. In this section, I argue that acceleration in strategic change creates a competitive advantage for firms, but up to a certain point, after which firms may spin out of control.

Acceleration in strategic change benefits firms for the following reason. Acceleration can be particularly beneficial when managers recognize a stage of disequilibrium in the market (Kirzner, 1997) and take actions immediately. The literature in entrepreneurship stresses the importance of opportunity discovery (Shane & Venkatraman, 2000). Although opportunities are everywhere, the recognition of such opportunities depends on how managers hold beliefs about the value of opportunities (Shane & Venkatraman, 2000). In particular, new opportunities enable firms to create new information, exploit market inefficiencies, and react to shifts in the market before others do (Drucker, 1985). Thus, those firms that discover and enact new opportunities sooner than other firms will engage in consecutive strategic changes at a faster rate and will reap

the benefits of such new opportunities before other firms do. In support of my argument, recent research has found that entrepreneurial alertness directly affects strategic change decisions and firm performance (Roundy, Harrison, Khavul, Pérez-Nordtvedt, & McGee, 2018). Therefore, in order to take advantage of new opportunities that are out there for the taking, I suggest that firms should accelerate the speed of strategic change as soon as they discover opportunities. Such acceleration will lead to superior firm performance.

Yet, acceleration in strategic change becomes detrimental after a certain point. In this vein, I propose an inverted U-shaped relationship between acceleration in strategic change and firm performance. The main reason for the detrimental effect of acceleration after a certain point is the sense of urgency argument. When firms adhere to accelerating the schedule of strategic changes from fast to faster, firms increase the sense of urgency around meeting deadlines for people within the organization (Perlow et al., 2002). Arguably, this sense of urgency has a powerful psychological impact for managers to synchronize deadlines and intensify their efforts (Brown & Eisenhardt, 1997). Thus, it may help a firm to coordinate more effectively and work smoothly with a flow (Brown & Eisenhardt, 1997). However, if this sense of urgency is too excessive, it further reinforces the need for fast decisions at the expense of the quality and effectiveness of those decisions at which point the decisions become self-destructive (Perlow et al., 2002). For example, in the context of a new venture, Perlow et al. (2002) found that accelerated strategic decision speed was initially quite effective because “faster development of business alliances [which] led to a Web site that attracted more users; and more rapid hiring decisions at headquarters increased the capacity of the firm to make other decisions more quickly” (Perlow et al., 2002; 938). However, when the new venture was doing poorly at its late stage, it tried to accelerate the speed of its decision-making to cover for losses or unmet

expectations. This even more accelerated decision-making speed led the new venture to making the hasty decision to sell the new venture to another firm without fully considering other possible alternatives. The undesirable results were largely attributed to paying too much attention to increasing the rate of change of speed and the new venture falling prey of the *speed trap* (Perlow et al., 2002). Based on the above arguments, I propose the following relationship between acceleration in strategic change and firm performance. Thus:

*Hypothesis 5: The relationship between acceleration in strategic change and firm performance is an inverted U-shape.*

Given the arguments made above and in the previous section, it is important to note that acceleration and frequency in strategic change, in conjunction, matter to firm performance. In particular, I suggest that frequency in strategic change negatively moderates the relationship between acceleration in strategic change and firm performance. This is because the benefit of acceleration in strategic change depends on what level of speed (i.e., frequency) the firm is currently at. Firms that are slow at strategic change will benefit most from accelerating the frequency of their strategic changes. In other words, acceleration is likely more important for firms that make strategic changes infrequently. Yet, it may have a null or negative effect on firm performance for those firms that already have a high frequency in the implementation of strategic change. As such, I expect that:

*Hypothesis 6: The interaction between frequency in strategic change and acceleration in strategic change is negatively associated with firm performance.*

### 3.5 Polychronicity in Strategic Change and Firm Performance

Again, I defined polychronicity in strategic change as the degree to which a series of consecutive strategic changes overlap in a specific time frame as opposed to are done sequentially. With regards to the performance implications of polychronicity in strategic change, I argue that polychronicity impacts firm performance positively, but up to a point, at which it becomes detrimental to firm performance. Therefore, I suggest that polychronicity in strategic change has a curvilinear (i.e., inverted U-shape) effect on firm performance.

Up to a certain point, as the degree of polychronicity in strategic change increases, so does firm performance. I argue that when firms tend to implement several strategic changes at the same time, such firms are likely to have polychronic organizational cultures. The main benefit of such polychronic culture stems from its ability to provide members at all levels of the organization, including senior managers, with insightful information. Polychronic organizational cultures value organizational members who perform several tasks at once, move back and forth among tasks, or both (Hall, 1983). Due to the nature of multitasking and intermittent patterns of task behavior, organizational members are less likely to stick to their initial plans, schedules, and deadlines (Bluedorn et al., 1999). In other words, these individuals have more fluidity and flexibility in their approach to time. Consequently, organizational members that form part of polychronic organizational cultures very often interact with each other, and thereby build informal long-term relationships with one another (Bluedorn et al., 1992). Through the establishment of informal interactions, top-level managers are likely to obtain *insightful* information which is *timely*, *relevant*, *soft*, and *privileged* (Souitaris & Maestro, 2010). This timely and relevant information facilitates effective decision-making (Eisenhardt, 1989). Furthermore, soft and privileged information via small talk, telephone calls, and meetings is

valuable as it appeals to main customers (Mintzberg, 1973). All in all, this insightful information may extend the pool of viable strategic options for top managers (Hambrick & Mason, 1984), leading to higher firm performance (Souitaris & Maestro, 2010).

However, at extreme levels of polychronicity in strategic change, the positive aspects of a polychronic culture are outweighed by the negative aspects of polychronicity, leading to performance decrements. There are at least two adverse effects of extreme polychronicity. First, psychological research has highlighted the negative consequences of individuals performing several tasks at the same time, having intermittent patterns of task engagement, or both (Hecht & Allen, 2005; Jett & George, 2003; Perlow, 1999). Such high degree of polychronicity, for example, has been found to generate adverse psychological effects, such as work stress and confusion (Cotte & Ratneshwar, 1999). Generated work stress and confusion may not allow the organization to effectively implement strategic changes as organizational members are frequently interrupted forcing them to disconnect the flow of their work (Hecht & Allen, 2005). Thus, I expect that, due to this extreme polychronicity, organizational members are not able to finish tasks given that their work efficiency is affected, resulting in negative firm performance.

Second, when polychronicity is extreme and too many strategic changes are initiated at one point in time, *sensemaking* and *sensegiving* by an organization become problematic leading to poor firm performance. Gioia and Chittipeddi (1991) introduced the concepts of sensemaking and sensegiving to understand the initial stage of a strategic change process. The concepts explain how senior managers develop the revised idea of an organization (i.e., sensemaking) and negotiate the idea with their organizational members (i.e., sensegiving). Along these lines, prior studies in strategic management have investigated how senior managers' cognition initiates strategic changes (e.g., Barr, 1998; Hambrick & Mason, 1984; Walsh, 1995). Yet, a firm's ability

to convey the abstract meaning of strategy to organizational members is likely not exclusively limited to the senior managers' sensemaking process (Rouleau, 2005). Instead, it should also rely on the ability of lower-level organizational members, such as middle-level and frontline managers, to make sense of the change in strategic actions in order to implement tactical and operational plans. For instance, in the case that the strategic planning from senior managers calls for many strategic changes at a time, lower-level managers and organizational members who actually take action may not be able to implement additional changes due to their limited capacity for the cognitive processing of information (Lang, 2000). Consequently, these lower-level managers may fail to espouse the strategic vision developed by senior managers, which means that the sequential link between sensemaking and sensegiving breaks. The failure between the sensemaking and sensegiving process may indicate that senior managers do not precisely estimate their core capability (Leonard-Barton, 1992), leading to lower firm performance.

Based on the ideas above, I propose that while implementing consecutive strategic changes at the same time – being polychronic in the implementation of strategic changes - is beneficial to firms as these firms obtain insightful information (Souitaris & Maestro, 2010), such benefit only works to a certain point. When the level of polychronicity in strategic change reaches the uppermost limit, where organizational members suffer from work stress and confusion and the link between sensemaking and sensegiving breaks, firm performance starts to hurt. Therefore, I propose the following hypothesis:

*Hypothesis 7: The relationship between polychronicity in strategic change and firm performance is an inverted U-shape.*



### 3.6 Linearity in Strategic Change and Firm Performance

As presented in Chapter 2, linearity in strategic change indicates the degree to which current strategic changes are different from previous strategic changes and will be different from future strategic changes such that consecutive strategic changes over time are novel, unique and out of the box. This is because under the linear time perspective, the firm perceives time to be new. In other words, the firm looks forward in time. Thus, the present is different from the past and the future (Crossan et al., 2005). As the firm often follows different patterns in the issue of strategic analyses, formulation, and implementation, subsequent strategic changes are the result of the invention of new strategies. As such, future strategic changes require creativity, and innovative approaches.

As to the performance implications, therefore, I posit that linearity in strategic change allows firms to generate greater value by creating new market demand. In fact, value creation has long been discussed as a main force of competitive advantage (Franko, 1989; Kim & Mauborgne 2004; Porter 1990) and greater value creation, in turn, is derived from firm innovation (Adner & Kapoor, 2010). According to Austrian economics, only a few economic actors acknowledge the unmet market needs or market imperfections which have a high potential for the creation of value (Schumpeter, 1934; Nelson & Winter, 1982; Jacobson, 1992). Similarly, as discussed by Kim and Mauborgne (2004), competition in existing markets limits the potential market share that a firm can hope to obtain. Thus, a competitive advantage cannot be sustained for a long time in existing markets. Further, they argued that firms should pioneer *blue oceans* where there are no competitors by introducing innovative products and services for long-term sustainability. Although being a first mover through the invention of new strategies in the market is accompanied by some liabilities (Huff & Robinson, 1994), it generates greater advantages as

firms sustain leadership in technology, secure market assets, generate economic rents, and impose high buyer switching costs (Lieberman & Montgomery, 1988). Thus:

*Hypothesis 8: Linearity in strategic change has a positive effect on firm performance.*

### **3.7 Cyclicalitv in Strategic Change and Firm Performance**

Previously, I defined cyclicalitv in strategic change as the degree to which past strategic changes reappear in current and future strategic changes such that consecutive strategic changes are grounded on learning and forecasting by extrapolating the past into the future. I suggest that firms can take advantages from cyclicalitv because established routines of strategic change can also be a source of competitive advantage (Kogut, Shan, & Walker 1992; Powell, Koput, & Smith-Doerr, 1996).

The advantages from cyclicalitv in strategic change stem from at least two sources: increased strategic legitimacy and reduced search costs. I will discuss each in turn. First, when strategic changes rooted in the past, ambiguity is reduced and organizational members can be more easily be directed to achieve goals. The repetitive use of the past allows organizational members to fully recognize the past in the present and the future (Crossan et al., 2005). To clarify, the repetition enables the firm's subsequent strategic changes to be carefully articulated and likely implemented as originally designed (Andrews 1987; Ansoff, 1965). Therefore, cyclicalitv can increase legitimacy in the pursuit of goals (Suchman, 1995).

Moreover, cyclicalitv in strategic change can reduce search costs. Strategic changes are not risk-free activities, and they are always accompanied by costs. As discussed in Hypothesis 4 regarding the frequency dimension, consecutive strategic changes increase administrative costs.

However, the costs of new-to-the-world or new-to-the-firm strategic changes are derived not only from administrative costs but also from search costs to create and nurture new knowledge (Dierickx & Cool, 1989; Zollo & Winter, 2002). Thus, firms following a cyclical view of time reduce search costs by following the past that they have already experienced. For instance, in social network research, Gulati (1995) explored endogenous factors that influence the propensity of organizations to enter interorganizational relationships. Testing the idea of strategic alliances over a twenty-year period, they found that the number of prior strategic alliances between firms increased the likelihood of them forming a new alliance again in the future. Such repetitive alliance pattern was attributed to the purpose of reducing search costs because entering alliances faced the risk of opportunism by partners. Such opportunism could be reflected in partners limiting their contributions or using their partners' resources and information for free (Gulati, 1995). Partnering again with the same firms, reduced this cost of opportunism, and reflects a cyclical interpretation of time. In all, cyclicity in strategic change can increase strategic legitimacy (Suchman, 1995) and reduce search costs (Gulati, 1995). Therefore, firms are encouraged to revisit the past when needed. As such, I expect that:

*Hypothesis 9: Cyclicity in strategic changes has a positive effect on firm performance.*

Based on the arguments made in Hypotheses 8 and 9, some may argue that the combination of linearity and cyclicity in strategic change would seem difficult to achieve. However, I argue that these two subjective time-dimensions are not always mutually exclusive but together can provide better performance benefits. By providing different, extreme scenarios

as illustrated in Table 3, I expand several attempts to synthesize linearity and cyclical debates on the issues of strategic change (Crossan et al., 2005; Cunha 2004; Cunha et al., 1999).

Table 3  
Linearity and Cyclical in Strategic Change and Performance Implications

		<i>Linearity</i>	
		Low	High
<i>Cyclical</i>	Low	<p>(a)</p> <p>The firm makes strategic changes without much consideration of the past and without much novelty</p> <p>Below average performance due to lack of strategic legitimacy, efficiency, and innovation effects</p>	<p>(b)</p> <p>The firm only makes novel, innovative and out of the box strategic changes</p> <p>Above average performance due to new value creation propositions</p>
	High	<p>(c)</p> <p>The firm only makes strategic changes that are similar to previous ones by forecasting through extrapolating the past into the future</p> <p>Above average performance due to increased strategic legitimacy and reduced search costs</p>	<p>(d)</p> <p>The firm makes strategic changes that are both novel and unique, as well as strategic changes based on past experiences</p> <p>Superior performance due to increased strategic legitimacy, reduced search costs, and innovation effects</p>

Table 3 presents four different scenarios depending on the combination of the two dimensions of the subjective interpretation of time in strategic changes. As represented in quadrant (a) in Table 3, firms that rarely implement strategic changes that are not creative and

novel, and that also have no grounding in the past can fall in this category. These firms are not benefiting from reliability on strategic roads, reduced search costs, and innovation effects in their strategic changes. On the other hand, in quadrant (b) and quadrant (c) in Table 3 describe situations where firms primarily follow linearity and cyclicity in strategic change, respectively. I have already explored these situations in Hypotheses 8 and 9. Again, firms in quadrant (c) in Table 3 enjoy above average performance because they exploit their organizational memory to enhance strategic legitimacy and reduce search costs. Similarly, firms in quadrant (b) in Table 3 also enjoy above average performance because they are constantly looking to find new ways to create value by exploring market imperfections.

More importantly, quadrant (d) in Table 3 depicts a situation where firms adopt both approaches at the same time in spite of the tradeoffs of following one approach over the other. To clarify, in the context of strategic planning process, firms in quadrant (d) in Table 3 would enact novel, innovative strategic change plans for the future. Yet, those same firms would also revisit their past strategic change choices to handle current challenges that they have already experienced. Although it would be difficult to completely eliminate these tradeoffs, prior studies have contended that successful firms are likely to reconcile them to a large degree (Gibson & Birkinshaw, 2004; He & Wong, 2004). According to the concept of ambidexterity, “[e]arlier studies often regarded the trade-offs between these two activities as insurmountable, but more recent research describes *ambidextrous* organizations that are capable of simultaneously exploiting existing competencies and exploring new opportunities” (Raisch et al., 2009: 685). This statement clearly indicates that strategic planning process does not always necessarily lean toward one side or the other, but rather it can combine both linearity and cyclicity experiences of time in varying degrees. Thus, I suggest that firms may pursue subsequent strategic changes in

an innovative way to generate value (Adner & Kapoor, 2010; Franko, 1989; Kim & Mauborgne 2004; Porter 1990). At the same time, they may also seek the use of the past to achieve efficiency (Dierickx & Cool, 1989; Zollo & Winter, 2002) and to enhance reliability (Suchman, 1995). Those firms that can do both, and decide to follow both subjective interpretations of time, therefore, ultimately, may be better able to create a greater competitive advantage over time. In other words, firms in quadrant (d) in Table 3 experience greater firm performance than firms in quadrant (b) and quadrant (c) in Table 3. Therefore, I propose that:

*Hypothesis 10: The interaction between linearity in strategic change and cyclicity in strategic change is positively associated with firm performance.*

## CHAPTER 4

### RESEARCH METHODS

In this chapter, I describe the research methods employed to test my hypotheses. I organize this chapter into four sections: 1) research design, 2) sample and data collection, 3) measures, 4) confirmatory factor analysis.

#### 4.1 Research Design

I adopted a cross-sectional survey research design using data from either an owner or a strategic decision maker for each business as the unit of analysis. A cross-sectional survey uses data collected from people who are similar in their characteristics, but different in their key behaviors or constructs of interest in a study. Given time and budget constraints, cross-sectional data from top executives can accurately describe firm behaviors. Hence, it is often used in the literature, particularly in the fields of strategic management (e.g., Morgan, Vorhies, & Mason, 2009; Xu, Guo, Zhang, & Dang 2018) and entrepreneurship (e.g., Au & Kwan, 2009; Khavul et al., 2010).

#### 4.2 Sample and Data Collection

The target population for this study was small and medium-sized businesses (SMEs) in various industries in South Korea (Korea) that have established a strategic partnership with a public institution or an industrial cooperative university. The cooperation among public institutions, universities, and industries plays a role for knowledge dissemination, technology

transfer, and innovation to firms, industries, and a nation (Eom & Lee, 2010). For this reason, the Korean government, the Ministry of SMEs and Startups, desires to foster mutual benefits through industry-government and industry-university linkages. Therefore, I expect that potential respondents under such relationships are more likely to provide reliable responses.

In general, I used a non-probability sampling procedure because the total number of SMEs listed in the Ministry of SMEs and Startups in Korea was 3,604,773 (Ministry of SMEs and Startups, 2019). Thus, it may not be possible to test the entire population. Although this sampling method is less stringent and likely relies on the expertise of researchers, I reduced sampling bias by collecting data through multiple methods and from multiple sources.

To recruit survey participants, in summer of 2018, I used a multi-method approach by delivering both online and in-person surveys. For the online survey, I first created an electronic version of the survey as an Excel spread-sheet form. I then contacted a mediator who manages a number of SMEs in a local government agency, Chungbuk Business Agency, in the North Chungcheong province in Korea. The main goal of this government agency is to strengthen competitiveness and to support innovation of SMEs for a solid foundation of the regional economy. Once the mediator agreed to support this study, I and the mediator randomly selected 600 SMEs registered in the agency. However, I was not able to personally obtain their contact information due to confidentiality. Instead, the mediator emailed the electronic version of the survey to the 600 randomly selected SMEs with an explanation of the purpose of the study. The potential survey participants were directed to reply to my email address. As soon as the mediator sent an email to the SMEs, I received 132 email notifications explaining that the emailed survey could not be delivered to the potential survey participants because 1) the receiver's mail box was full or 2) the email address was not identifiable. The primary reason for this was that the email



addresses of the potential survey participants had not been updated in the system for a while. It is very likely that many of these 132 SMEs were out of business at the time of the survey.

Therefore, the sampling population dropped from 600 to 468 SMEs. Following an initial request for participation on the survey, a reminder email was sent in three days later. Among the 468 SMEs, 97 SMEs completed the survey, yielding 20.7% response rate. However, I excluded 21 surveys from the total of 97 surveys because the survey participants were not strategic decision makers in their company. The final sample for the survey delivered online was, therefore, 76 SMEs.

Given the relatively low response rate, I assessed non-response bias by conducting both *t*-test and non-parametric Mann-Whitney test between the early survey participants and the late ones. I did this with the main variables in this study, that are, the 7 time-dimensions and firm performance, and also with firm age (the number of years in operation) and firm size (the number of employees). The former test assumes that data is normally distributed while the latter test does not. Table 4 shows the *t*-test results and Table 5 shows the results from non-parametric Mann-Whitney test. Results from both *t*-tests and non-parametric Mann-Whitney tests between the early vs. late survey participants among the study variables indicate that there are no statistically significant differences between the two groups. Therefore, nonresponse bias was not a concern for the online survey method of data gathering.

Table 4

## T-test between Early Online-survey and Late Online-Survey

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
AGE	Equal variances assumed	-0.049	74.000	0.961	-0.117	2.412	-4.923	4.689
	Equal variances not assumed	-0.050	72.869	0.961	-0.117	2.366	-4.834	4.599
SIZE	Equal variances assumed	0.590	74.000	0.557	12.355	20.940	-29.369	54.079
	Equal variances not assumed	0.608	73.891	0.545	12.355	20.319	-28.132	52.843
PERF	Equal variances assumed	0.508	74.000	0.613	0.111	0.219	-0.324	0.546
	Equal variances not assumed	0.521	73.509	0.604	0.111	0.213	-0.314	0.536
REG	Equal variances assumed	1.284	74.000	0.203	0.328	0.255	-0.181	0.836
	Equal variances not assumed	1.337	73.869	0.185	0.328	0.245	-0.161	0.816
EVENT	Equal variances assumed	0.661	74.000	0.511	0.137	0.207	-0.276	0.550
	Equal variances not assumed	0.658	67.752	0.513	0.137	0.208	-0.279	0.553
FREQ	Equal variances assumed	0.209	74.000	0.835	0.056	0.267	-0.476	0.587
	Equal variances not assumed	0.205	63.403	0.839	0.056	0.272	-0.488	0.599
ACC	Equal variances assumed	-0.290	74.000	0.773	-0.077	0.266	-0.607	0.453
	Equal variances not assumed	-0.286	65.386	0.776	-0.077	0.269	-0.615	0.461
POLY	Equal variances assumed	-0.030	74.000	0.976	-0.008	0.280	-0.566	0.549
	Equal variances not assumed	-0.029	67.816	0.977	-0.008	0.281	-0.569	0.552
CYC	Equal variances assumed	-0.008	74.000	0.993	-0.002	0.200	-0.399	0.396
	Equal variances not assumed	-0.008	65.196	0.993	-0.002	0.202	-0.406	0.402
LIN	Equal variances assumed	0.039	74.000	0.969	0.011	0.278	-0.542	0.564
	Equal variances not assumed	0.041	73.957	0.968	0.011	0.267	-0.522	0.543

Note. AGE = firm age; SIZE = firm size; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicity; LIN = linearity.

Table 5

Mann-Whitney Test between Early Online-survey and Late Online-Survey

	AGE	SIZE	PERF	REG	EVENT	FREQ	ACC	POLY	CYC	LIN
MWU	689.50	679.00	668.50	663.00	628.00	685.50	662.50	689.50	688.50	678.50
WW	1635.50	1240.00	1229.50	1224.00	1189.00	1246.50	1608.50	1635.50	1634.50	1624.50
Z	-0.21	-0.32	-0.43	-0.49	-0.86	-0.25	-0.49	-0.21	-0.22	-0.33
Sig	0.83	0.75	0.67	0.62	0.39	0.80	0.62	0.83	0.83	0.74

*Note.* MWU = Mann-Whitney U; WW = Wilcoxon W; Sig = Asymp. Sig. (2-tailed); AGE = firm age; SIZE = firm size; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicalilty; LIN = linearity.

To ensure data collection yielded a larger number of participants and a different source for generalizability purposes, I additionally conducted an in-person survey along with the online one. Initially, I contacted two faculty members at a university who manage several industry-university cooperation projects. They introduced me to two mediators who directly worked for SMEs supported by the university as well as the government. The first mediator manages 46 biomedical SMEs in Chungbuk Biovalley for Academy-Industry Convergence. This business institution helps entrepreneurs discover and cultivate their innate entrepreneur potential by providing financial support, office space, and management training. The first mediator was able to collect 31 surveys from the SMEs managed by the institution. The second mediator was the director of Global Trade Expert Incubating Program (GTEP) at the University. GTEP, co-supervised by Korean Ministry of Knowledge and Economy and The Korea International Trade Association, helps SMEs in the regional area export their products to global markets. The second mediator, the director of GTEP, collected 22 surveys from the SMEs that have made a business agreement with GTEP. Thus, both mediators were able to collect 53 surveys from the SMEs belonging to these cooperative arrangements.

At the same time, using my personal network, I was able to secure additional survey participants, which resulted in a total of 110 in-person surveys along with the surveys from the mediators (52 surveys from the mediators and 58 surveys from my personal network. From the 110 surveys, I omitted 1 survey due to no response variance in rating for the items that measure the main study constructs (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). I also eliminated 2 surveys due to missing values. For these two surveys, more than half of the response options were empty. Additionally, 11 surveys were deemed not usable because the survey participants did not have authority to make important decisions in their company. In other words, when asked if they made strategic decisions for their firms, these 11 respondents answered “No.” All in all, I ended up with a sample of 172 SMEs, 76 SMEs from the online survey and 96 SMEs from the in-person one.

Participant selection using different methods may create sampling bias. In order to examine whether the multi-method approach created sampling bias, I conducted both *t*-test and non-parametric Mann-Whitney test between those SMEs that responded through the online survey and those that responded through the in-person delivery method. Results are shown in Table 6 and 7. The test results for firm age, firm size, firm performance, and 7 time-dimensions between the online and in-person surveys were not statistically and significantly different at the 5 % level, except for regularity in strategic change ( $p = 0.025$ ) in non-parametric Mann-Whitney test. Therefore, I concluded that the samples from different methods were less biased.

There were missing values present in this study. However, all variables had less than 5.1 % of missing values. If the percentage of missing values is less than approximately 5%, the missing values are likely to produce unbiased results (Acuna & Rodriguez, 2004). Thus, I treated the missing values with a replacement. Although pairwise/listwise deletion and replace with the

mean are the simplest ways to deal with missing values, such treatments may not be desirable. Instead, the decision to handle missing values should depend on the patterns of missing values. The patterns are commonly described as “missing completely at random (MCAR)”, “missing at random”, and “missing not at random” (Little & Rubin, 1987). Since the Little’s MCAR test (Little, 1988) results were statistically non-significant ( $p > 0.05$ ), the missing pattern among all the study variables was MCAR. Thus, using the expected maximization (EM) technique, which performs best when missing patterns are MCAR, I imputed values derived from the EM procedure.

### **4.3 Measures**

In this study, strategic change is defined as a change in key organizational activities initiated by top managers to achieve a competitive advantage. Referring to strategic change, a large body of research relies on the combination of six indicators to measure the degree to which a change in strategy is made over time (e.g., Bednar, Boivie, & Prince, 2013; Finkelstein & Hambrick 1990, Zhang & Rajagopalan 2010). The indicators are “(1) advertising intensity (advertising/sales), (2) research and development intensity (R&D/sales), (3) plant and equipment newness (net P&E/gross P&E), (4) nonproduction overhead (selling, general, and administrative expenses/sales), (5) inventory levels (inventories/sales), and (6) financial leverage (debt/equity)” (Finkelstein & Hambrick 1990: 491). However, one of the main reasons for the use of the indicators is that it is relatively easier to access and collect secondary data (Finkelstein & Hambrick 1990), which may not be quite representative of actual strategic changes. In other words, the measure for strategic change should encompass a broader and narrower scope of changes which are still controllable by top managers and have an important effect on firm performance as stated above in the definition of strategic change.

Table 6

## T-test between Online-survey and Offline-survey

		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
AGE	Equal variances assumed	-0.669	170.000	0.504	-1.024	1.529	-4.042	1.995
	Equal variances not assumed	-0.664	155.455	0.508	-1.024	1.542	-4.070	2.022
SIZE	Equal variances assumed	0.162	170.000	0.871	2.029	12.486	-22.619	26.676
	Equal variances not assumed	0.159	143.641	0.874	2.029	12.780	-23.232	27.289
PERF	Equal variances assumed	1.479	170.000	0.141	0.195	0.132	-0.065	0.455
	Equal variances not assumed	1.449	145.891	0.149	0.195	0.134	-0.071	0.460
REG	Equal variances assumed	1.804	170.000	0.073	0.299	0.166	-0.028	0.625
	Equal variances not assumed	1.794	157.391	0.075	0.299	0.166	-0.030	0.627
EVENT	Equal variances assumed	0.700	170.000	0.485	0.098	0.141	-0.179	0.376
	Equal variances not assumed	0.703	163.965	0.483	0.098	0.140	-0.178	0.374
FREQ	Equal variances assumed	-0.954	170.000	0.342	-0.165	0.173	-0.507	0.177
	Equal variances not assumed	-0.950	158.788	0.343	-0.165	0.174	-0.508	0.178
ACC	Equal variances assumed	0.875	170.000	0.383	0.143	0.164	-0.180	0.466
	Equal variances not assumed	0.862	150.363	0.390	0.143	0.166	-0.185	0.472
POLY	Equal variances assumed	-0.509	170.000	0.612	-0.090	0.176	-0.438	0.259
	Equal variances not assumed	-0.504	154.657	0.615	-0.090	0.178	-0.442	0.262
CYC	Equal variances assumed	1.759	170.000	0.080	0.228	0.130	-0.028	0.484
	Equal variances not assumed	1.753	159.058	0.082	0.228	0.130	-0.029	0.485
LIN	Equal variances assumed	-0.076	170.000	0.939	-0.012	0.162	-0.332	0.307
	Equal variances not assumed	-0.074	139.220	0.941	-0.012	0.166	-0.341	0.317

Note. AGE = firm age; SIZE = firm size; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicity; LIN = linearity.

Table 7

## Mann-Whitney Test between Online-survey and Offline-survey

	AGE	SIZE	PERF	REG	EVENT	FREQ	ACC	POLY	CYC	LIN
MWU	3457.00	3382.00	3269.50	2920.50	3412.50	3346.50	3360.00	3530.00	3059.00	3644.00
WW	8113.00	6308.00	6195.50	5846.50	6338.50	8002.50	6286.00	8186.00	5985.00	6570.00
Z	-0.59	-0.82	-1.17	-2.25	-0.73	-0.93	-0.89	-0.36	-1.82	-0.01
Sig	0.56	0.41	0.24	0.02	0.47	0.35	0.37	0.72	0.07	0.99

*Note.* MWU = Mann-Whitney U; WW = Wilcoxon W; Sig = Asymp. Sig. (2-tailed); AGE = firm age; SIZE = firm size; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicalilty; LIN = linearity.

In that regard, Miller and Friesen (1980) identified critical decisions and events that can represent a pattern of major changes in an organization. Therefore, based on their work, I used 9 indicators for strategic change as key organizational activities. Specifically, the strategic changes used in this study were: (1) the introduction of new products or services, (2) the replacement of a top executive (president or CEO), (3) the building of a major new facility, (4) the adoption of a significantly different production technology, (5) a change in distribution, promotion, or pricing strategies and techniques, (6) the modification of organizational structure and the distribution of authority, (7) acquisitions, mergers, or alliances, (8) the addition of new departments, and (9) the modification of administrative practices to espouse corporate policies and goals. Consequently, survey participants were encouraged to answer the questions regarding their temporal strategies (i.e., 7 time-dimensions) with respect to the major changes that they had engaged in over the last three years. The survey asked them to think about these changes and to respond the survey accordingly.

As previously validated measures for time-dimensions in strategic change were not available, I developed the measures in three stages to secure the content and face validity of the

items. First, I generated a preliminary set of 34 items to measure the 7 time-dimensions after an extensive literature review and discussions with three management and one marketing faculty, members at a major public U.S. university. Second, I sent the initial items with a well-defined definition for each time-dimension to a total of 10 Ph.D. students in business administration, who were either in the department of management (6 Ph.D. students), in the department of operations management (2 Ph.D. students), or in the department of marketing (2 Ph.D. students). I then let them rate whether the items I developed represent well the corresponding definitions. To be more specific, they had three response options (i.e., 1 = it does not represent the definition, 2 = I do not know, and 3 = Yes, it represents the definition) to choose for each item. After the 10 Ph.D. student judges evaluated each item, I retained only items that at least 5 of them perceived as representative. This process allowed me to eliminate 3 items and retain 31 items to measure the time-dimensions. Third, I invited a faculty in the field of strategy with a wealth of industrial experience from a major Korean university and 4 business practitioners from Korea to further analyze the retained items. The pretest participants were encouraged to provide qualitative comments on the items that were ambiguous and faulty. Based on their comments, I made additional changes. Appendix B provides detailed items for each time-dimension.

As shown in Table 8, I evaluated the items using exploratory factor analysis (principal axis factoring with oblimin rotation). The factor analysis (factor loadings below 0.40 were suppressed) resulted in a total of seven factors with eigenvalues exceeding 1 and explained 79.13% of the total variance. All the items were clearly loaded on each latent factor. Moreover, the value of Kaiser-Meyer-Olkin was 0.904 with a significant chi-square value for the Bartlett's test of sphericity ( $\chi^2 = 5119.69$ ,  $p < 0.001$ ). I then examined internal consistency for each measure. Measures with a Cronbach's alpha of 0.70 or higher are indicative of good internal



consistency (Nunnally, 1994). The Cronbach's alpha values for all the main study variables, namely regularity (REG,  $\alpha = 0.913$ ), eventfulness (EVENT,  $\alpha = 0.878$ ), frequency (FREQ,  $\alpha = 0.931$ ), acceleration (ACC,  $\alpha = 0.951$ ), polychronicity (POLY,  $\alpha = 0.921$ ), linearity (LIN,  $\alpha = 0.924$ ), and cyclicity (CYC,  $\alpha = 0.869$ ) in strategic change, demonstrated adequate levels of reliability. Overall, these statistics indicated that the measurement instrument for the 7 time-dimensions was appropriate.

As I was interested in how various time-dimensions are associated with a firm's performance, the dependent variable in this study was firm performance (PERF). The majority of the firms in my sample were privately owned. Thus, I was not able to access publicly available data measuring firm performance. Consistently with previous research using privately-owned businesses (e.g., Morgan et al., 2009), I measured firm performance through a self-report scale of relative performance. Although one may doubt the reliability of the subjective assessments of firm performance, research has shown that the subjective assessments are highly correlated with their objective equivalents (Dess & Robinson, 1984). In fact, the subjective assessments for firm performance have been often used in the literature (e.g., Khavul et al., 2010; Morgan et al., 2009; Roundy et al., 2018). Following Morgan et al. (2009), I measured firm performance by asking survey participants a question that "when compared to your competitors, how would you rate your company" on five items: (1) return on sales; (2) return on investment; (3) reaching financial goals; (4) growth in sales revenue, and (5) overall firm performance. Each item was measured based on a 7-point scale, ranging from 1=much worse to 7=much better. The Cronbach's alpha value for firm performance was  $\alpha = 0.919$ , suggesting good internal consistency.

Table 8  
Explanatory Factory Analysis

	Factor						
	1	2	3	4	5	6	7
POLY_3	0.956						
POLY_2	0.923						
POLY_4	0.665						
POLY_1	0.574						
CYC_2		0.903					
CYC_3		0.851					
CYC_4		0.725					
CYC_5		0.695					
CYC_1		0.568					
EVENT_3			-0.929				
EVENT_2			-0.876				
EVENT_4			-0.812				
EVENT_1			-0.730				
EVENT_5®			-0.417				
REG_2				0.906			
REG_3				0.894			
REG_1				0.776			
REG_4				0.699			
REG_5®				0.593			
LIN_4					0.888		
LIN_3					0.862		
LIN_2					0.725		
LIN_1					0.555		
ACC_4						-0.857	
ACC_3						-0.820	
ACC_2						-0.768	
ACC_1						-0.620	
FREQ_1							0.562
FREQ_4®							0.499
FREQ_2							0.486
FREQ_3							0.403

*Note.* Extraction Method: Principal Axis Factoring; Rotation Method: Oblimin with Kaiser Normalization; POLY = polychronicity; CYC = cyclicalilty; EVENT= eventfulness; REG = regularity; LIN = linearity; ACC = acceleration; FREQ = frequency; ® = reverse coded item.

I included multiple control variables that may affect dependent variables in this study. I controlled for the number of different types of strategic change (TYPESC) among the 9 key organizational activities that the SMEs engaged in the last three years. This is because firms with ample resources may be easier to initiate various types of key activities than those with less resources. I controlled for Firm age (AGE), the number of years in operation, and Firm size (SIZE), the number of employees. I also controlled for whether the firms exported their products/services (EXPORT, coded as 1) or not (coded as 0). To control for industry effects, I dummy coded for firms as primarily a service business (SERVICE, coded as 1) or as primarily a manufacturing business (coded as 0). Moreover, I controlled for a different method in participant selection, the online survey participants (ONLINE) were coded as 1 and the in-person survey participants were coded as 0. Finally, I controlled for whether the survey participants were the owner (OWNER, coded as 1) or not (coded as 0).

#### **4.4 Confirmatory Factor Analysis**

Using Mplus 7.0 (Muthen & Muthen, 1998), I conducted confirmatory factor analysis (CFA) to assess the fitness of the measurement model. In order to ensure an adequate fit for the model, I examined goodness of fit indices, that are, 1) the  $\chi^2$  statistic, 2) the  $\chi^2/df$  ratio, 3) the maximum likelihood-based Standardized Root Mean Square Residual (SRMR), 4) the Tucker-Lewis Index (TLI), 5) the Competitive Fit Index (CFI), and 6) the Root Mean Square Error of Approximation (RMSEA). The  $\chi^2$  statistic becomes very sensitive as the sample size gets larger (Bentler, 1990). Thus, it is likely to incorrectly indicate a bad model fit. Instead, the  $\chi^2/df$  ratio should be less than 3 and preferably less than 2. In addition, Hu and Bentler, (1998; 1999) suggest that SRMR should be always reported due to the sensitivity for incorrectly specified

factor covariances. Also, other fit indices, such as TLI, CFI, and RMSEA should supplement it because these indices are susceptible to misspecified factor loadings. In general, an SRMR value of less than .08 is considered a good fit, but a value greater than 0.1 would indicate a bad fit. For CFI and TLI, the values for both indices less than 0.95 indicate a good fit, but values of less than 0.90 indicate a bad fit. Lastly, the RMSEA value should be lower than 0.06 to be considered a good fit while the value should not exceed 0.1.

The results from the measurement model fit indices (see Table 9) ensured an acceptable fit although it was not an excellent fit ( $\chi^2(566) = 1020.779, p < .001$ ; SRMR = 0.076; RMSEA = 0.068; CFI = 0.922; TLI = 0.913). The  $\chi^2/df$  ratio was less than 2 and SRMR was less than 0.08. Moreover, RMSEA was close to 0.06. These results implied a good model fit while the values for CFI and TLI were mediocre.

Table 9  
Measurement Model Fit Indices

CFA	$\chi^2$	<i>df</i>	$\chi^2 / df$	SRMR	CFI	TLI	RMSEA
Measurement Model Fit	1020.78***	566	1.80	0.076	0.922	0.913	0.068***

*Note.* \*\*\*  $p < 0.001$ . CFA = confirmatory factor analysis; *df* = degree of freedom.

To assess convergent validity, I examined the item loadings and the values of average variance extracted (AVE) for each factor. As shown in Table 10, all item loadings were statistically significant and greater than 0.6. However, two items (i.e., REG\_5r = 0.569, EVENT\_5r = 0.430) were lower than the target loading of 0.6, suggesting that the items may not

account for a larger portion of the variance of their respective factor. It may be because the items were reverse-coded, and thereby the survey participants could have misinterpreted the questions (Swain, Weathers, & Niedrich 2008). In practice, reverse-coded items often produce unexpected factor loadings (Netemeyer, Bearden, & Sharma 2003). Considering the issue of reverse coding and that these were a single item in two different instruments, in general, the factor loadings were deemed to be adequate.

Table 10 illustrates the values of AVE. Each factor's AVE value should be above 0.50 to be considered to have an adequate level of convergent validity (Fornell & Larcker, 1981). All the values of AVE were greater than 0.5, ranging from 0.574 to 0.818. This means that each construct accounts for more variance than measurement error does. Therefore, together, both the item loadings and the values of AVE confirmed that the convergent validity of the measurement model was appropriate.

For discriminant validity to be evaluated, I examined whether the square root of the AVE value was higher than the highest correlation between the latent factors (Fornell & Larcker, 1981). Table 11 provides the results. Specifically, in Table 11 presented below, the values highlighted in bold text in the diagonal matrix are the square root of the AVE value while the values in the off-diagonal matrix are the correlations among the latent factors. As shown in both Table 10 and 11, the square root of each factor's AVE value has a higher value than the highest correlation between the latent factors. These results suggest strong discriminant validity.

Table 10

## Measurement Model Statistics

Latent Variable	Item	Estimate	S.E.	Cronbach's $\alpha$	AVE	Sqrt of AVE > The highest Corr
Regularity	REG_1	0.915***	0.015	0.913	0.697	0.835>0.601
	REG_2	0.943***	0.012			
	REG_3	0.909***	0.016			
	REG_4	0.781***	0.032			
	REG_5r	0.569***	0.054			
Eventfulness	EVENT_1	0.776***	0.034	0.878	0.629	0.793>0.425
	EVENT_2	0.923***	0.017			
	EVENT_3	0.930***	0.016			
	EVENT_4	0.801***	0.031			
	EVENT_5r	0.430***	0.065			
Frequency	FREQ_1	0.943***	0.011	0.931	0.602	0.887>0.776
	FREQ_2	0.946***	0.011			
	FREQ_3	0.906***	0.016			
	FREQ_4r	0.734***	0.037			
Acceleration	ACC_1	0.882***	0.019	0.951	0.818	0.904>0.673
	ACC_2	0.882***	0.019			
	ACC_3	0.947***	0.011			
	ACC_4	0.935***	0.012			
Polychronicity	POLY_1	0.844***	0.025	0.921	0.755	0.869>0.776
	POLY_2	0.939***	0.014			
	POLY_3	0.907***	0.017			
	POLY_4	0.776***	0.033			
Linearity	LIN_1	0.763***	0.034	0.924	0.754	0.868>0.673
	LIN_2	0.799***	0.030			
	LIN_3	0.950***	0.011			
	LIN_4	0.945***	0.012			
Cyclicity	CYC_1	0.551***	0.057	0.869	0.574	0.757>0.269
	CYC_2	0.926***	0.019			
	CYC_3	0.885***	0.022			
	CYC_4	0.720***	0.040			
	CYC_5	0.637***	0.050			
Performance	PERF_1	0.806***	0.031	0.919	0.698	0.836>0.571
	PERF_2	0.822***	0.030			
	PERF_3	0.851***	0.025			
	PERF_4	0.864***	0.024			
	PERF_5	0.834***	0.028			

Note. S.E. = standard error; AVE = average variance extracted; Sqrt of AVE = square root of average variance extracted; The highest Corr = the highest correlation between latent factors

Table 11  
Discriminant Validity

	1	2	3	4	5	6	7	8
1. Performance	<b>0.836</b>							
2. Acceleration	0.557	<b>0.904</b>						
3. Regularity	0.557	0.627	<b>0.835</b>					
4. Eventfulness	0.283	0.415	0.291	<b>0.793</b>				
5. Frequency	0.594	0.720	0.601	0.425	<b>0.887</b>			
6. Cyclicity	0.166	0.224	0.251	0.269	0.241	<b>0.757</b>		
7. Linearity	0.571	0.673	0.514	0.379	0.624	0.203	<b>0.868</b>	
8. Polychronicity	0.565	0.636	0.589	0.396	0.776	0.231	0.587	<b>0.869</b>

#### 4.5 Common Method Variance

In this study, the fact that I obtained information on independent and dependent variables at the same time from the same survey participants is likely to give rise to common method variance (CMV) problems, also called common method bias (Podsakoff & Organ, 1986). CMV is “variance that is attributable to the measurement method rather than to the constructs the measures represent” (Podsakoff et al., 2003: 879). Thus, CMV likely generates a false internal consistency or apparent correlation among study variables. Therefore, I first proactively considered CMV using procedural remedies to mitigate CMV (Podsakoff et al., 2003). Then, in a post hoc manner, I examined the possible existence of CMV using Harman's single-factor test and the single unmeasured latent method test (Podsakoff et al., 2003).

I used several procedural remedies. First, I tried to refine the questions by keeping the questions simple, specific, and concise and by avoiding ambiguous terms and providing examples if the use of ambiguous terms was a must (Podsakoff et al., 2003) (see Appendix B). Second, I ensured the anonymity and confidentiality for the survey participants so that they could

be aware that there were no right or wrong answers and so that they would provide as honest as possible responses to the questions (Chang, Witteloostuijn, Eden, 2010) (see Appendix B). Third, I used different scale types such as 1) from “strongly agree” to “strongly disagree”, 2) from “never” to “very often”, and 3) from “much worse” to “much better” (see Appendix B). Also, I intentionally included several reverse-coded items (see Appendix B) because the participants may lose their motivation while reading many questions. These remedies would reduce the likelihood of the consistency motive (Podsakoff et al., 2003). Fourth, the majority of the hypothesized relationships among the variables were non-linear (i.e., curvilinear and moderating effects) which are less likely to be the part of the survey participant’s cognitive map (Harrison, McLaughlin, & Coalter 1996). Fifth, the questions regarding the time-dimensions were mainly fact-based questions (i.e. what changes have made and when was it?). These questions were less associated with the participant’s evaluation apprehension making them answer questions in a socially desirable way (Podsakoff et al., 2003). Finally, I collected a subset of firm performance data from the same survey participants 6 to 8 months later and conducted additional analysis to support the robustness of the results of this study. This additional analysis is often used in the literature (e.g., Xu et al., 2018).

In addition to these procedural remedies, in order to check the possible existence of CMV, I first conducted Harman's single-factor test in which all items loaded on one general factor. The one factor model yielded a bad fit ( $\chi^2(594) = 3452.057, p < .001$ ; SRMR = 0.116; RMSEA = 0.167; CFI = 0.506; TLI = 0.477). Moreover, such model was considerably worse than the measurement model fit described above (see Table 9). Due to the insensitivity of Harman's single-factor test, however, it is often considered an inefficient test for CMV (Podsakoff et al., 2003). Thus, I additionally employed the single unmeasured latent method test

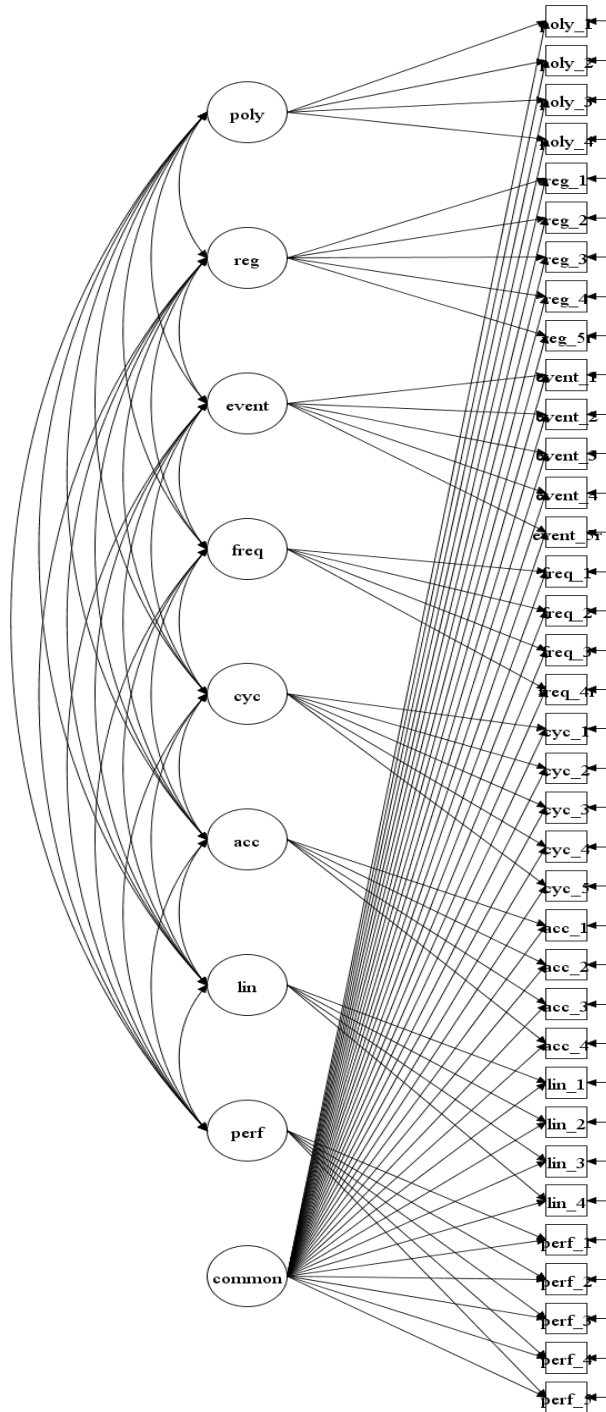


which is best to use in cases where independent and dependent variables are obtained from a single source at the same point in time and the source of method bias cannot be identified (Podsakoff et al., 2003), as is the case in this study. To conduct the test, all the items were loaded on their respective factors as well as on a latent common method factor (see Table 12). However, the single unmeasured latent method test yielded an excellent fit ( $\chi^2(530) = 823.778, p < .001$ ; SRMR = 0.046; RMSEA = 0.067; CFI = 0.949; TLI = 0.940), which implies CMV may exist.

Consequently, I further examined whether the item loadings in the measurement model are greater than the common method loadings. As shown in Table 13, the average percentage of variance accounted for by the items in the measurement model (53.5%) was higher than the average percentage of variance accounted for by the common method factor (19.5%). Therefore, I concluded that CMV did not appear to be a critical problem although I was not able to completely rule out the effects concerning CMV in this study.

Table 12

Single Unmeasured Latent Method Test



*Note.* POLY = polychronicity; CYC = cyclicalilty; EVENT= eventfulness; REG = regularity; LIN = linearity; ACC = acceleration; FREQ = frequency; PERF = performance; COMMON = a latent common method factor.

Table 13

## Standardized Item Loading VS Common Method Loading

ITEM	Sd Item Loading	Sd Item Loading Sq	Sd Method Loading	Sd Method Loading Sq
POLY_1	0.615	0.378	0.616	0.379
POLY_2	0.821	0.674	0.453	0.205
POLY_3	0.846	0.716	0.371	0.138
POLY_4	0.647	0.419	0.428	0.183
REG_1	0.749	0.561	0.537	0.288
REG_2	0.869	0.755	0.399	0.159
REG_3	0.767	0.588	0.481	0.231
REG_4	0.739	0.546	0.277	0.077
REG_5R	0.441	0.194	0.358	0.128
EVENT_1	0.686	0.471	0.41	0.168
EVENT_2	0.879	0.773	0.249	0.062
EVENT_3	0.935	0.874	0.157	0.025
EVENT_4	0.767	0.588	0.252	0.064
EVENT_5R	0.441	0.194	0.025	0.001
FREQ_1	0.706	0.498	0.631	0.398
FREQ_2	0.793	0.629	0.524	0.275
FREQ_3	0.775	0.601	0.48	0.230
FREQ_4R	0.443	0.196	0.628	0.394
CYC_1	0.521	0.271	0.509	0.259
CYC_2	0.938	0.880	-0.004	0.000
CYC_3	0.884	0.781	0.010	0.000
CYC_4	0.714	0.510	0.055	0.003
CYC_5	0.610	0.372	0.447	0.200
ACC_1	0.631	0.398	0.643	0.413
ACC_2	0.727	0.529	0.495	0.245
ACC_3	0.787	0.619	0.523	0.274
ACC_4	0.839	0.704	0.443	0.196
LIN_1	0.558	0.311	0.553	0.306
LIN_2	0.629	0.396	0.504	0.254
LIN_3	0.855	0.731	0.428	0.183
LIN_4	0.836	0.699	0.443	0.196
PERF_1	0.693	0.480	0.418	0.175
PERF_2	0.691	0.477	0.448	0.201
PERF_3	0.666	0.444	0.531	0.282
PERF_4	0.717	0.514	0.481	0.231
PERF_5	0.709	0.503	0.441	0.194
<b>Average</b>		<b>0.535</b>		<b>0.195</b>

Note. Sd Item Loading – standardized item loading; Sd Item Loading Sq = standardized item loading square; POLY = polychronicity; CYC = cyclicalilty; EVENT= eventfulness; REG = regularity; LIN = linearity; ACC = acceleration; FREQ = frequency; PERF = performance.

## CHAPTER 5

### RESULTS

In this chapter, I present the results of my study and the formal test of my hypotheses. I organize this chapter into three sections: 1) descriptive statistics, 2) results, and 3) post hoc analysis.

#### 5.1 Descriptive Statistics

Table 14 provides general descriptive statistics. These statistics are: minimum/maximum values, means, standard deviation, skewness, and kurtosis. The SMEs in the final sample have been in operation for 11 years on average ranging from 0.5 to 45 years. The average firm size was 41, ranging from 1 to 500 employees. Out of the 9 key organizational activities, the sampled SMEs have made 4 strategic changes on average within the last three years. Moreover, 41% of the SMEs were international as they indicated they exported their products/services. Those SMEs operating in service industries were 42% while the rest of the SMEs belonged to manufacturing industries. In addition, 44% of the SMEs participated in this study through the online survey method. Finally, more than half of the participants (52%) reported themselves as the owner for each SME.

To check for normality, I examined the Fisher's skewness and kurtosis values for the study variables. If the values fall between  $-1.96$  and  $+1.96$ , one can say that the distribution is close to normal (Abu-Bader, 2016). However, if the absolute values are greater than 10, it absolutely violates the normality assumption (Abu-Bader, 2016). As shown in Table 14, all the

values were in between or quite close to the criteria range. Yet, the distribution of firm size was extremely non-normal (Skewness = 3.9, Kurtosis = 16.9). Therefore, I log-transformed firm size (LSIZE, skewness = 0.47, kurtosis = - 0.11).

Table 14  
Descriptive Statistics (N = 172)

	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis		
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
AGE	0.50	45.00	11.32	9.94	1.49	0.19	1.85	0.37
SIZE	1.00	500.00	41.40	81.09	3.90	0.19	16.92	0.37
LSIZE	0.00	2.70	1.19	0.57	0.47	0.19	-0.11	0.37
TYPESC	1.00	9.00	3.94	1.75	0.46	0.19	-0.14	0.37
EXPORT	0.00	1.00	0.41	0.49	0.36	0.19	-1.89	0.37
SERVICE	0.00	1.00	0.42	0.50	0.31	0.19	-1.93	0.37
ONLINE	0.00	1.00	0.44	0.50	0.24	0.19	-1.97	0.37
OWNER	0.00	1.00	0.52	0.50	-0.09	0.19	-2.01	0.37
REG	1.80	7.00	4.10	1.09	0.55	0.19	-0.01	0.37
EVENT	2.00	6.60	4.36	0.91	0.03	0.19	-0.28	0.37
FREQ	2.00	7.00	4.50	1.13	0.06	0.19	-0.40	0.37
ACC	1.00	7.00	4.39	1.07	-0.09	0.19	-0.07	0.37
POLY	1.00	7.00	4.51	1.15	-0.12	0.19	0.13	0.37
LIN	1.50	7.00	4.55	1.05	-0.15	0.19	0.36	0.37
CYC	2.20	7.00	4.45	0.85	0.33	0.19	0.77	0.37
PERF	1.60	6.40	4.21	0.86	0.04	0.19	0.41	0.37

*Note.* AGE = firm age; SIZE = firm size; LSIZE = log firm size; TYPESC = the number of types of strategic changes made; EXPORT = whether a firm exports its products/services; SERVICE = whether a firm is operating in a service industry; ONLINE = online survey participants; OWNER = whether the survey participant is an owner; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicity; LIN = linearity.

Multicollinearity would be an issue if at least one independent variable is highly correlated with a combination of the other independent variables (Cohen, West, & Aiken, 2014). In the case of high correlations among independent variables, some independent variables may be found not to be statistically significant, although the variables are theoretically correlated with a dependent variable. That is due to the inflated standard errors of the beta coefficients (Cohen et al., 2014). In practice, the multicollinearity issues may not be problematic if the variance inflation factor (VIF) value is less than 5, indicating moderate correlations among independent variables at best. In this study, the highest VIF value was 3.166 between frequency and cyclicity in strategic change. Thus, multicollinearity was not a critical issue.

Pearson's correlations among independent, dependent, and control variables are presented in Table 15. Consistent with my theoretical arguments, there were significant correlations among the 7-time dimensions and firm performance. Specifically, regularity ( $r = 0.54, p < 0.01$ ), eventfulness ( $r = 0.28, p < 0.01$ ), frequency ( $r = 0.57, p < 0.01$ ), acceleration ( $r = 0.54, p < 0.01$ ), and polychronicity ( $r = 0.54, p < 0.01$ ), linearity ( $r = 0.56, p < 0.01$ ), and cyclicity ( $r = 0.24, p < 0.01$ ) in strategic change were positively correlated with firm performance.

Table 15  
Correlation Matrix (N= 172)

	AGE	LSIZE	TYPESC	EXPORT	OWNER	ONLINE	SERVICE	REG	EVENT	FREQ	ACC	POLY	LIN	CYC
AGE	1													
LSIZE	0.63**	1												
TYPESC	0.06	0.11	1											
EXPORT	0.17*	0.20**	0.18*	1										
OWNER	-0.32**	-0.43**	-0.08	-0.22**	1									
ONLINE	0.05	-0.07	0.19*	0.47**	-0.28**	1								
SERVICE	-0.05	-0.10	-0.14	-0.53**	0.12	-0.50**	1							
REG	0.14	0.21**	0.23**	0.14	0.03	-0.14	0.03	1						
EVENT	0.04	0.06	0.19*	0.08	0.07	-0.05	-0.05	0.24**	1					
FREQ	0.00	0.12	0.37**	0.27**	-0.06	0.07	-0.02	0.57**	0.37**	1				
ACC	-0.01	0.14	0.30**	0.17*	0.01	-0.07	-0.06	0.59**	0.36**	0.70**	1			
POLY	-0.10	0.06	0.37**	0.19*	-0.04	0.04	-0.06	0.55**	0.38**	0.74**	0.63**	1		
LIN	-0.15*	0.02	0.25**	0.12	0.09	0.01	-0.10	0.52**	0.38**	0.62**	0.68**	0.59**	1	
CYC	-0.03	0.11	0.06	-0.05	0.12	-0.13	0.15*	0.28**	0.31**	0.27**	0.28**	0.28**	0.25**	1
PERF	-0.02	0.12	0.17*	0.07	0.03	-0.11	0.05	0.54**	0.28**	0.57**	0.54**	0.54**	0.56**	0.24**

Note. \* p < 0.05, \*\* p < 0.01, AGE = firm age; LSIZE = log firm size; TYPESC = the number of types of strategic changes made; EXPORT = whether a firm exports its products/services; SERVICE = whether a firm is operating in a service industry; OWNER = whether the survey participant is an owner; ONLINE = online survey participants; PERF = firm performance; REG = regularity; EVENT= eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; CYC = cyclicity; LIN = linearity.

## 5.2 Results

I used hierarchical multiple regression analysis using SPSS 25 to test hypotheses. The results are presented in Table 16 for Hypotheses 1 – 7 and in Table 17 for Hypotheses 8 – 10. To test Hypotheses 1 – 7, I included all control variables (Model 1 in Table 16) in the first step. I then separately entered regularity (Model 2 Table 16) and eventfulness (Model 3 in Table 16) in strategic change to test Hypotheses 1 and 2. Then, I entered the interaction term between regularity and eventfulness in strategic change with its main effects to test Hypotheses 3 (Model 4 in Table 16). Next, I separately tested the effects of frequency (Model 5 in Table 16) and acceleration (Model 6 in Table 16) on firm performance. Then, I tested Hypothesis 6 by adding the interaction term between acceleration and frequency (Model 7 in Table 16) in strategic change with its main effects. Finally, to test Hypotheses 4, 5, and 7, the inverted U-shaped relationships, I separately entered the quadratic term of frequency (Model 9 in Table 16), acceleration (Model 10 in Table 16), and polychronicity (Model 11 in Table 16) in strategic change with its respective main effect.

Similar to the previous procedure, to test Hypotheses 8 – 10, I entered all control variables first (Model 1 in Table 17). Next, I separately entered linearity (Model 2 in Table 17) and cyclicity (Model 3 in Table 17) in strategic change to test Hypotheses 8 and 9, respectively. I then added the interaction term between linearity and cyclicity (Model 5 in Table 17) in strategic change with its main effects to test Hypothesis 10.

In result, the base model with all control variables (Model 1 in Table 16 and 17) indicated that both log firm size ( $\beta = 0.293$ ,  $p < 0.10$ ) and the number of types of strategic change ( $\beta = 0.083$ ,  $p < 0.05$ ) were positively associated with firm performance.



Hypothesis 1 and 2 predicted that regularity and eventfulness in strategic change have positive effects on firm performance, respectively. Model 2 ( $\beta = 0.414$ ,  $p < 0.01$ ) and Model 3 ( $\beta = 0.222$ ,  $p < 0.01$ ) in Table 16 confirmed the relationships. Thus, both Hypothesis 1 and Hypothesis 2 were supported.

Hypothesis 3 predicted that regularity and eventfulness in strategic change together have a positive and synergistic effect on firm performance. However, the interaction term ( $\beta = -0.042$ ,  $p > 0.5$ ) in Model 4 in Table 16 was not statistically significant. Thus, Hypothesis 3 was not supported.

Hypotheses 4, 5, and 7 predicted inverted U-shaped relationships between frequency, acceleration, and polychronicity in strategic change and firm performance. Model 5 ( $\beta = 0.447$ ,  $p < 0.01$ ), Model 6 ( $\beta = 0.413$ ,  $p < 0.01$ ), and Model 8 ( $\beta = 0.409$ ,  $p < 0.01$ ) in Table 16 showed that there are positive and direct relationships between frequency, acceleration, and polychronicity in strategic change and firm performance. However, Model 9 ( $\beta = 0.013$ ,  $p > 0.05$ ), Model 10 ( $\beta = 0.003$ ,  $p > 0.05$ ), and Model 11 ( $\beta = 0.061$ ,  $p < 0.05$ ) in Table 16 did not find support for the curvilinear relationships. Even though the quadratic term of polychronicity in strategic change was statistically significant, it was the opposite direction to my expectation. Figure 8 depicts the curvilinear (i.e., U-shaped) relationship between polychronicity in strategic change and firm performance. That is, firm performance does not increase much at moderate levels of polychronicity, but it is exponentially enhanced at extreme levels of polychronicity.

Next, Hypothesis 6, suggesting that frequency in strategic change negatively moderates the relationship between acceleration in strategic change and firm performance, was not supported as shown in Model 7 ( $\beta = 0.038$ ,  $p > 0.05$ ) in Table 16.

Table 16

## Hierarchical Regression Results for H1 – H7 (N=172)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Firm Performance												
<i>Intercept</i>	3.153*** (0.306)	2.304*** (0.312)	2.654*** (0.404)	1.021 (1.041)	2.189*** (0.305)	2.099*** (0.332)	2.642** (0.806)	2.089*** (0.323)	2.447** (0.739)	2.156** (0.765)	3.226*** (0.637)	1.511*** (0.358)
AGE	-0.012 (0.008)	-0.013† (0.007)	-0.012 (0.008)	-0.014† (0.007)	-0.004 (0.007)	-0.005 (0.007)	-0.003 (0.007)	-0.001 (0.007)	-0.004 (0.007)	-0.005 (0.008)	-0.001 (0.007)	-0.004 (0.007)
LSIZE	0.293† (0.164)	0.166 (0.143)	0.285† (0.160)	0.171 (0.142)	0.153 (0.139)	0.164 (0.144)	0.120 (0.137)	0.209 (0.142)	0.151 (0.140)	0.162 (0.145)	0.183 (0.141)	0.118 (0.132)
TYPESC	0.083* (0.038)	0.023 (0.034)	0.061 (0.038)	0.008 (0.034)	-0.013 (0.034)	0.009 (0.035)	-0.019 (0.034)	-0.014 (0.035)	-0.012 (0.034)	0.009 (0.035)	-0.010 (0.035)	-0.035 (0.033)
EXPORT	0.247 (0.164)	0.048 (0.145)	0.208 (0.160)	0.029 (0.144)	-0.077 (0.144)	0.058 (0.146)	-0.078 (0.141)	0.055 (0.144)	-0.081 (0.145)	0.058 (0.146)	0.031 (0.143)	-0.087 (0.136)
OWNER	0.157 (0.154)	0.060 (0.134)	0.117 (0.150)	0.034 (0.133)	0.166 (0.130)	0.114 (0.135)	0.095 (0.128)	0.183 (0.133)	0.116 (0.130)	0.113 (0.136)	0.178 (0.131)	0.088 (0.124)
ONLINE	-0.209 (0.171)	-0.026 (0.150)	-0.155 (0.167)	0.002 (0.149)	-0.197 (0.144)	-0.045 (0.151)	-0.130 (0.144)	-0.132 (0.148)	-0.199 (0.145)	-0.046 (0.152)	-0.131 (0.146)	-0.048 (0.141)
SERVICE	0.151 (0.165)	0.078 (0.144)	0.171 (0.161)	0.078 (0.144)	-0.042 (0.141)	0.147 (0.144)	0.010 (0.140)	0.095 (0.142)	-0.045 (0.142)	0.147 (0.145)	0.114 (0.141)	0.024 (0.135)
REG		0.414*** (0.056)		0.589* (0.249)								0.189** (0.065)
EVENT			0.222** (0.071)	0.321 (0.226)								0.029 (0.063)
REG*EVENT				-0.042 (0.051)								
FREQ					0.447*** (0.055)		0.151 (0.180)		0.326 (0.319)			0.180* (0.080)
ACC						0.413*** (0.058)	0.028 (0.188)			0.386 (0.327)		0.105 (0.074)
FREQ*ACC							0.038 (0.038)					
POLY								0.409*** (0.054)			-0.133 (0.268)	0.128† (0.073)
FREQsq									0.013 (0.035)			
ACCsq										0.003 (0.037)		
POLYsq											0.061* (0.030)	
F-statistic	2.151*	9.312***	3.214**	8.206***	11.021***	8.880***	10.086***	9.743***	9.761***	7.846***	9.305***	10.162***
R <sup>2</sup>	0.084	0.314	0.136	0.338	0.351	0.304	0.385	0.323	0.352	0.304	0.341	0.434
R <sup>2</sup> change		0.230***	0.052**	0.254***	0.267***	0.219***	0.301***	0.239***	0.268***	0.219***	0.257***	0.350***

*Note.* Standard deviations are in parentheses; †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; AGE = firm age; LSIZE = log firm size; TYPESC = the number of types of strategic changes made; EXPORT = whether a firm exports its products/services; ONLINE = online survey participants; OWNER = whether the survey participant is an owner; SERVICE = whether a firm is operating in a service industry; REG = regularity; EVENT = eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; LIN = linearity; CYC = cyclicity; sq = squared.

Figure 8

U-shaped Relationship between Polychronicity in Strategic Change and Firm Performance

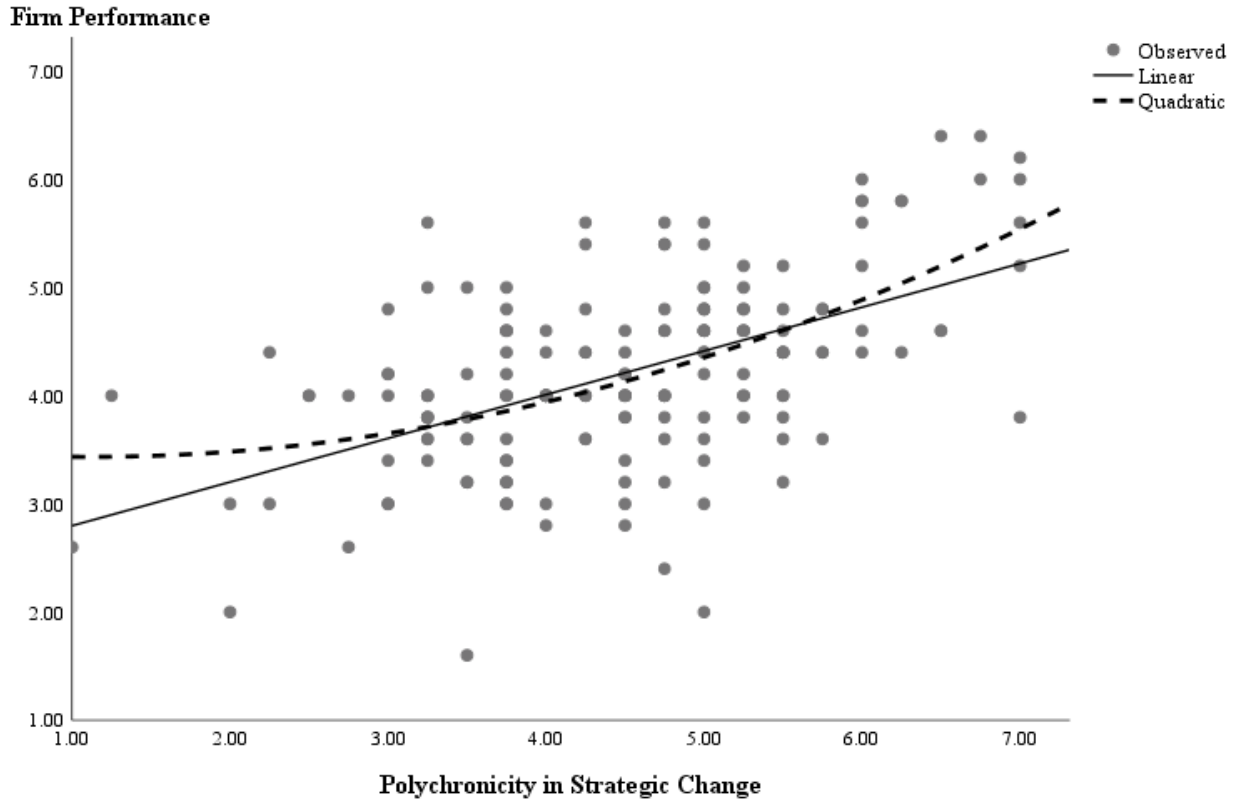


Table 17 shows the results for Hypotheses 8 – 10. Hypothesis 8 and 9 predicted that linearity and cyclicity in strategic change have positive effects on firm performance, respectively. Model 2 ( $\beta = 0.446$ ,  $p < 0.01$ ) and Model 3 ( $\beta = 0.194$ ,  $p < 0.05$ ) in Table 17 found support for both these direct relationships. Therefore, Hypotheses 8 and 9 were supported. However, Hypothesis 10, the interaction effect between linearity and cyclicity in strategic change on firm performance, was not supported as shown in Model 5 ( $\beta = 0.018$ ,  $p > 0.05$ ) in Table 17.

Table 17

## Hierarchical Regression Results for H8 – H10 (N=172)

	Model 1	Model 2	Model 3	Model 4	Model 5
	Firm Performance				
<i>Intercept</i>	3.153*** (0.306)	1.827*** (0.335)	2.818*** (0.411)	1.595*** (0.390)	1.974 (1.246)
AGE	-0.012 (0.008)	0.001 (0.007)	-0.009 (0.008)	0.001 (0.007)	0.001 (0.007)
LSIZE	0.293† (0.164)	0.151 (0.140)	0.203 (0.165)	0.119 (0.143)	0.113 (0.144)
TYPESC	0.083* (0.038)	0.020 (0.033)	0.076* (0.037)	0.019 (0.033)	0.021 (0.034)
EXPORT	0.247 (0.164)	0.132 (0.140)	0.232 (0.162)	0.129 (0.140)	0.134 (0.141)
OWNER	0.157 (0.154)	0.055 (0.131)	0.093 (0.154)	0.032 (0.133)	0.032 (0.133)
ONLINE	-0.209 (0.171)	-0.154 (0.145)	-0.213 (0.168)	-0.157 (0.145)	-0.160 (0.146)
SERVICE	0.151 (0.165)	0.187 (0.140)	0.086 (0.165)	0.159 (0.142)	0.163 (0.143)
LIN		0.446*** (0.056)		0.431*** (0.057)	0.351 (0.257)
CYC			0.194* (0.078)	0.080 (0.069)	-0.005 (0.273)
LIN*CYC					0.018 (0.055)
F-statistic	2.151*	10.602***	2.709***	9.591***	8.594***
R <sup>2</sup>	0.084	0.342	0.117	0.348	0.348
R <sup>2</sup> change		0.258***	0.033*	0.264***	0.264***

*Note.* Standard deviations are in parentheses; †  $p < 0.10$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ ; AGE = firm age; SIZE = firm size; LSIZE = log firm size; TYPESE = types of strategic changes; EXPORT = whether a firm exports its products/services; SERVICE = whether a firm is operating in a service industry; OWNER = whether the survey participant is an owner; LIN = linearity; CYC = cyclicalilty.

Table 18 provides a summary of the hypotheses and the results. Out of the 10 hypotheses proposed, four of them found support.

Table 18  
Summary of Hypotheses Test

	Hypotheses	Results
H1	Regularity in strategic change has a positive effect on firm performance.	Supported
H2	Eventfulness in strategic change has a positive effect on firm performance.	Supported
H3	The interaction between regularity in strategic change and eventfulness in strategic change is positively associated with firm performance.	Not supported
H4	The relationship between frequency in strategic change and firm performance is an inverted U-shape.	Not supported
H5	The relationship between acceleration in strategic change and firm performance is an inverted U-shape.	Not supported
H6	The interaction between frequency in strategic change and acceleration in strategic change negatively associated with firm performance.	Not supported
H7	The relationship between polychronicity in strategic change and firm performance is an inverted U-shape.	Not supported
H8	Linearity in strategic change has a positive effect on firm performance.	Supported
H9	Cyclicity in strategic change has a positive effect on firm performance.	Supported
H10	The interaction between linearity in strategic change and cyclicity in strategic change is positively associated with firm performance.	Not supported

### 5.3 Post hoc Analysis

After the initial data collection, I was able to obtain firm performance data from a subsample of 47 SMEs out of my original sample of 172 SMEs. Six to eight months after the initial data collection, I reached out to my sample firms to request that they fill out a shorter survey containing only the firm performance measure to run additional analysis. This is because one of the best ways to minimize the potential existence of CMV is to collect the dependent variable data at a different point in time (Podsakoff et al., 2003). The measure for firm performance was the same as before. As a reminder, the measure asked respondents the following stem question: when compared to your competitors, how would you rate your company on 1) return on sales, 2) return on investment, 3) reaching financial goals, 4) growth in sales revenue, and 5) overall firm performance. The scale ranged from 1=much worse to 7=much better.

I then regressed each independent variable collected on the main data collection effort (wave 1) on firm performance collected for this subsample of firms (wave 2). Table 19 and 20 show the results. Regarding the objective interpretation of time in strategic change, regularity ( $\beta = 0.437$ ,  $p < 0.01$ ), Model 2 in Table 19, eventfulness ( $\beta = 0.420$ ,  $p < 0.01$ ), Model 3 in Table 19, frequency ( $\beta = 0.339$ ,  $p < 0.05$ ), Model 5 in Table 19, acceleration ( $\beta = 0.309$ ,  $p < 0.05$ ), Model 6 in Table 19, and polychronicity ( $\beta = 0.333$ ,  $p < 0.01$ ), Model 8 in Table 19 were all positively and significantly associated with the second wave of firm performance. Also, the quadratic term of polychronicity ( $\beta = 0.105$ ,  $p < 0.10$ ), Model 11 in Table 19, was statistically significant, implying a standard U-shaped relationship as depicted in Figure 9. However, the interaction effects between regularity and eventfulness ( $\beta = 0.057$ ,  $p > 0.05$ ), Model 4 in Table 19, and frequency and acceleration ( $\beta = 0.012$ ,  $p > 0.05$ ), Model 7 in Table 19, were not statistically

significant. Also, I was not able to find support for the curvilinear (i.e., inverted U-shaped) effects of frequency ( $\beta = -0.005$ ,  $p > 0.05$ ), Model 9 in Table 19, and acceleration ( $\beta = -0.028$ ,  $p > 0.05$ ), Model 10 in Table 19, on the second wave of firm performance.

With respect to the subjective interpretation of time, found in Table 20, both linearity ( $\beta = 0.349$ ,  $p < 0.05$ ), Model 2 in Table 20, and cyclicity ( $\beta = 0.384$ ,  $p < 0.01$ ), Model 3 in Table 20, were positively and significantly related to the second wave of firm performance. However, the interaction effect between linearity and cyclicity ( $\beta = 0.082$ ,  $p > 0.05$ ), Model 5 in Table 20, on the second wave of firm performance was not statistically significant. Overall, the results were the same as the initial analysis with the full sample of 172 SMEs. This post hoc analysis gives confidence in the study results.

Finally, I correlated the performance measure collected in the first survey with the one in the second survey. The correlation was both significant and high as expected ( $r = 0.852$ ,  $p < 0.01$ ), providing further confidence in the results.

Table 19

## Post Hoc Regression Results for the Objective Interpretation of Time (N=47)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
2nd Wave Firm Performance												
<i>Intercept</i>	2.826*** (0.664)	1.623* (0.628)	1.224 (0.745)	1.871 (1.704)	1.631* (0.779)	1.431 (0.848)	1.447 (1.655)	1.428* (0.701)	1.551 (1.678)	1.052 (1.434)	3.113* (1.140)	1.005 (0.773)
AGE	-0.044* (0.018)	-0.025 (0.016)	-0.042* (0.016)	-0.029† (0.015)	-0.038* (0.017)	-0.035† (0.018)	-0.035† (0.018)	-0.032† (0.016)	-0.038* (0.018)	-0.034† (0.018)	-0.028† (0.016)	-0.028† (0.016)
LSIZE	0.780* (0.341)	0.481 (0.296)	0.642* (0.304)	0.483† (0.285)	0.826* (0.320)	0.840* (0.323)	0.842* (0.324)	0.745* (0.299)	0.823* (0.328)	0.839* (0.326)	0.613* (0.299)	0.443 (0.301)
TYPESC	0.116 (0.072)	0.034 (0.064)	0.076 (0.065)	0.036 (0.063)	0.039 (0.074)	0.086 (0.069)	0.049 (0.076)	0.072 (0.064)	0.038 (0.076)	0.083 (0.070)	0.088 (0.063)	0.025 (0.067)
EXPORT	0.037 (0.375)	-0.019 (0.315)	-0.019 (0.311)	-0.024 (0.304)	-0.051 (0.353)	-0.036 (0.355)	-0.062 (0.357)	0.218 (0.333)	-0.051 (0.328)	-0.038 (0.359)	0.360 (0.332)	0.061 (0.332)
OWNER	0.406 (0.328)	0.235 (0.279)	0.425 (0.290)	0.311 (0.271)	0.422 (0.307)	0.471 (0.310)	0.454 (0.312)	0.281 (0.290)	0.422 (0.312)	0.468 (0.314)	0.160 (0.289)	0.217 (0.283)
ONLINE	0.208 (0.375)	0.398 (0.318)	0.310 (0.332)	0.413 (0.305)	0.097 (0.354)	0.379 (0.360)	0.225 (0.384)	0.054 (0.331)	0.102 (0.373)	0.382 (0.364)	-0.088 (0.330)	0.270 (0.339)
SERVICE	-0.360 (0.343)	-0.285 (0.289)	-0.261 (0.304)	-0.196 (0.287)	-0.378 (0.321)	-0.358 (0.323)	-0.368 (0.326)	-0.108 (0.309)	-0.377 (0.326)	-0.369 (0.329)	0.084 (0.317)	-0.153 (0.301)
REG		0.437*** (0.105)		0.046 (0.469)								0.320* (0.131)
EVENT			0.420** (0.121)	0.052 (0.360)								0.245† (0.143)
REG*EVENT				0.057 (0.090)								
FREQ					0.339* (0.133)		0.178 (0.366)		0.382 (0.799)			0.013 (0.182)
ACC						0.309* (0.127)	0.121 (0.436)			0.524 (0.666)		-0.130 (0.165)
FREQ*ACC							0.012 (0.091)					
POLY								0.333** (0.093)			-0.537 (0.481)	0.130 (0.150)
FREQsq									-0.005 (0.097)			
ACCsq										-0.028 (0.085)		
POLYsq											0.105† (0.057)	
F-statistic	1.655	4.219**	3.372**	4.203**	2.464*	2.374*	2.039†	3.485**	2.133†	2.073†	3.668**	3.472**
R <sup>2</sup>	0.229	0.470	0.415	0.539	0.342	0.333	0.362	0.423	0.342	0.335	0.472	0.551
R <sup>2</sup> change		0.241***	0.186**	0.310***	0.112*	0.104*	0.132†	0.194**	0.113†	0.106†	0.243**	0.322**

*Note.* Standard deviations are in parentheses; † p < 0.10; \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001; AGE = firm age; LSIZE = log firm size; TYPESC = the number of types of strategic changes made; EXPORT = whether a firm exports its products/services; ONLINE = online survey participants; OWNER = whether the survey participant is an owner; SERVICE = whether a firm is operating in a service industry; REG = regularity; EVENT = eventfulness; FREQ = frequency; ACC = acceleration; POLY = polychronicity; LIN = linearity; CYC = cyclicity; sq = squared.



Figure 9

U-shaped Relationship between Polychronicity in Strategic Change  
and Second Wave Firm Performance

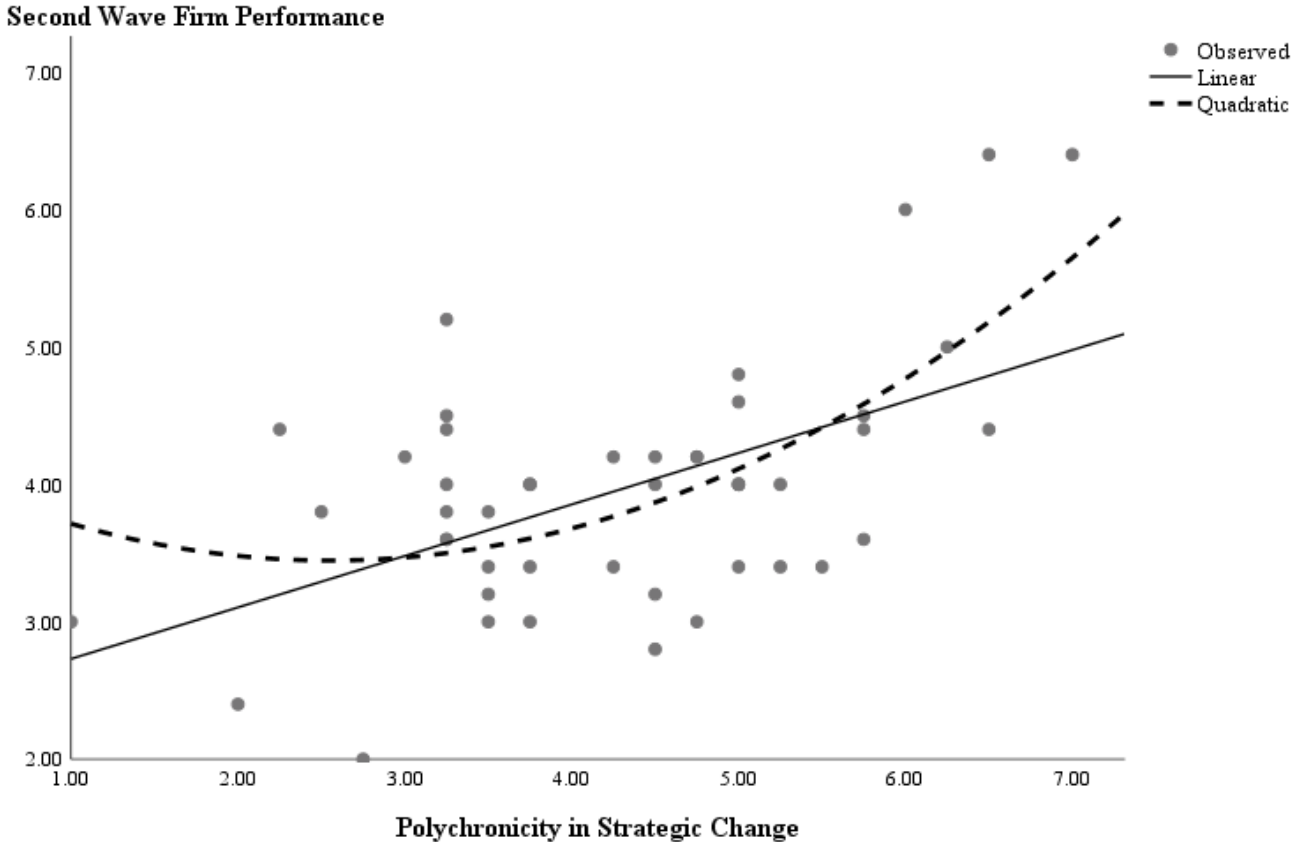


Table 20

## Post Hoc Regression Results for the Subjective Interpretation of Time (N=47)

	Model 1	Model 2	Model 3	Model 4	Model 5
	2nd Wave Firm Performance				
<i>Intercept</i>	2.826*** (0.664)	1.119 (0.895)	1.257 (0.800)	0.614 (0.899)	2.374 (2.304)
AGE	-0.044* (0.018)	-0.027 (0.018)	-0.043* (0.017)	-0.032† (0.018)	-0.031† (0.018)
LSIZE	0.780* (0.341)	0.793* (0.318)	0.672* (0.313)	0.708† (0.309)	0.624† (0.360)
TYPESC	0.116 (0.072)	0.087 (0.068)	0.132† (0.066)	0.110 (0.067)	0.115† (0.067)
EXPORT	0.037 (0.375)	0.016 (0.350)	0.016 (0.342)	0.009 (0.337)	0.004 (0.338)
OWNER	0.406 (0.328)	0.394 (0.306)	0.374 (0.299)	0.375 (0.294)	0.358 (0.296)
ONLINE	0.208 (0.375)	0.404 (0.357)	0.24 (0.342)	0.353 (0.345)	0.314 (0.349)
SERVICE	-0.36 (0.343)	-0.283 (0.321)	-0.522 (0.317)	-0.433 (0.318)	-0.407 (0.321)
LIN		0.349* (0.132)		0.214 (0.144)	-0.157 (0.470)
CYC			0.384** (0.128)	0.285† (0.143)	-0.091 (0.475)
LIN*CYC					0.082 (0.099)
F-statistic	1.655	2.540*	2.867*	2.876*	2.636*
R <sup>2</sup>	0.229	0.348	0.376	0.412	0.423
R <sup>2</sup> change		0.119*	0.147**	0.183**	0.194*

*Note.* Standard deviations are in parentheses; † p < 0.10; \* p < 0.05; \*\* p < 0.01; \*\*\* p < 0.001; AGE = firm age; SIZE = firm size; LSIZE = log firm size; TYPESE = types of strategic changes; EXPORT = whether a firm exports its products/services; SERVICE = whether a firm is operating in a service industry; OWNER = whether the survey participant is an owner; LIN = linearity; CYC = cyclicity.

## **CHAPTER 6**

### **DISCUSSION**

In Chapter 6, I further discuss the results from Chapter 5 in several venues. I first summarize the results presented in Chapter 5. Second, I discuss scholarly contributions to the literature. I then discuss managerial implications of this study. Next, I discuss limitations and future research. Finally, I finish this study with concluding remarks.

#### **6.1 Discussion of Major Findings**

For the objective interpretation of time in strategic change, I first found support for the idea that regularity in strategic change is positively associated with higher firm performance. Although firms may benefit from a sudden change, a performance benefit from consistently engaging in strategic change outweighs that of punctuated or irregular patterns in strategic change. This is because regularity helps the firms to gradually broaden and deepen their knowledge base along with increased experience, contributing to the development of better absorptive capacity (Vermeulen & Barkema, 2002). Moreover, when firms are regularly involved in strategic change, they are better able to manage transitions in between such changes (Brown & Eisenhardt, 1997). A shift from one change to another is a highly demanding process (Eisenhardt & Brown, 1998). Thus, it should be managed through a preplanned schedule and not as an afterthought. Furthermore, the regular pattern of strategic change by itself is subject to an organizational routine down the road, overcoming conventional practices and establishing

routines for change (Klarner & Raisch, 2013). This study provides evidence that regular strategic changes overcome inertial forces that stifle organizations.

I also found support for the idea that eventfulness in strategic change increases firm performance. While regularity in strategic change stresses action as a temporal strategy, eventfulness is about temporal reaction in strategy change. My results indicate that strategic change should also be responsive to changes occurring in internal and external environments alike (Crossan et al., 2005) because such high responsiveness allows firms to synchronize their dynamic rhythmic patterns of strategic change with meaningful events in their environments. By doing so, they can achieve temporal fit over time, leading to higher firm performance (Perez-Nordtvedt et al., 2008). In other words, eventfulness as temporal flexibility in the firm's strategic change approach addresses continuing organizational adaptation to environmental changes (Cunha, 2004; Khavul et al., 2010; Perez-Nordtvedt et al., 2008; 2014).

Regarding the subjective interpretation of time in strategic change, I provided evidence for the positive effect of linearity in strategic change on firm performance. A firm's ability to innovate successfully has long been a source of competitive advantage. As firms limit the use of the past in their current and future strategic change, the results are often new, unique, and creative over time (Crossan et al., 2005). Thus, such approaches to strategic change generate greater value by securing beneficial market assets (Lieberman & Montgomery, 1988), differentiating the focal firm from its competitors (Franko, 1989; Kim & Mauborgne 2004; Porter 1990), creating new market demand (Schumpeter, 1934; Nelson & Winter, 1982; Jacobson, 1992), and ultimately leading the market (Huff & Robinson, 1994).

Lastly, I found support for the positive effect of cyclicity in strategic change on firm performance. As discussed, linearity addresses innovative organizational change through a

forward-looking temporal lens. Cyclicity, on the other hand, suggests that current and future strategic changes should also be grounded on the past (Crossan et al., 2005; Cunha, 2004). The reasons would be historical routines and solutions that a firm has already experienced can contribute to the achievement of competitive advantage in future endeavors (Ansoff, 1965). To be more specific, the repetition of the past into the present and the future in strategic change promotes legitimacy among organizational members to achieve their goals (Suchman, 1995). Further, it reduces costs for exploring and nurturing new knowledge (Dierickx & Cool, 1989; Zollo & Winter, 2002). Likewise, under the concept of cyclicity, firms use the past not because it is the most familiar, but rather because it increases strategic legitimacy and minimizes costs.

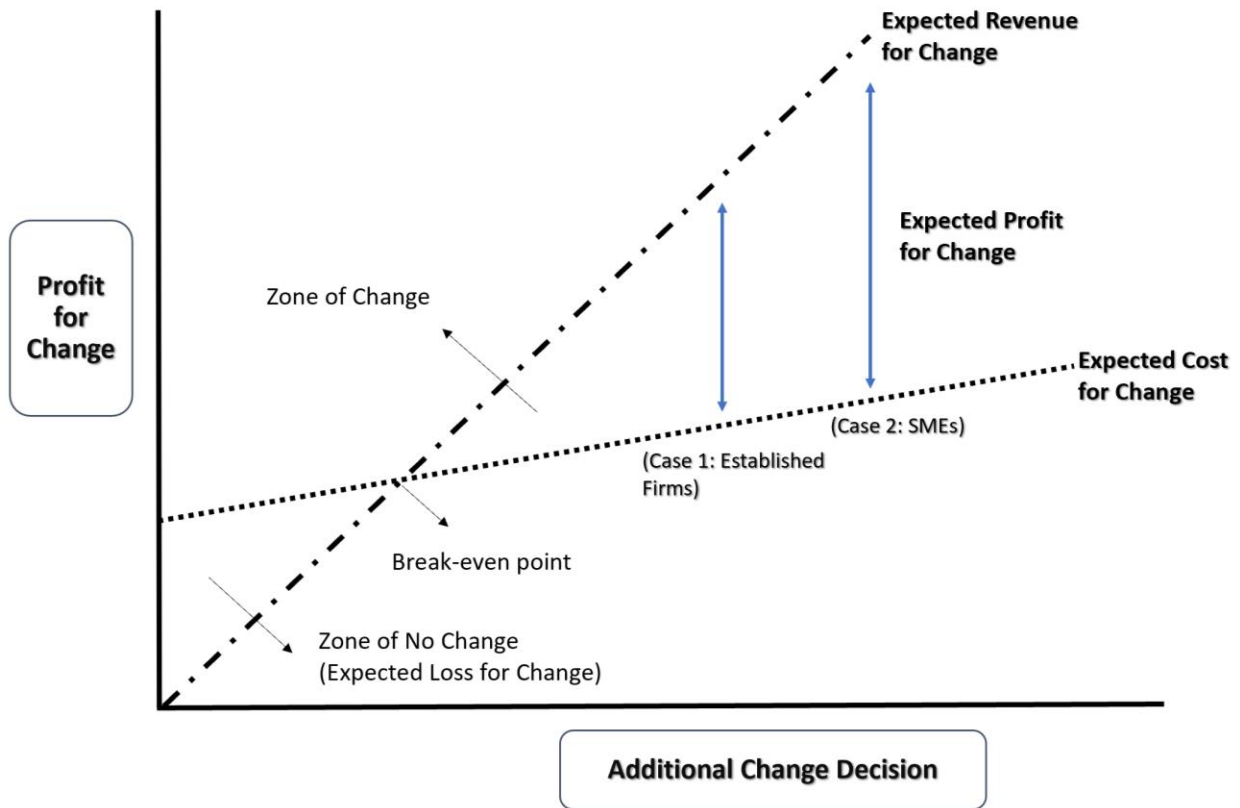
Surprisingly, I did not find support for the hypotheses regarding the non-linear relationships. Specifically, I proposed inverted U-shaped relationships between frequency, acceleration, and polychronicity in strategic change and firm performance. The reason for the inverted U-shaped relationships was because, although change is better than stability in general, making changes too often, with increasing speed, or at the same time also accompanies several adverse effects. Such adverse effects would result in performance decrease after a certain point. To be more specific, the detrimental effects on firm performance, I suggested, would be attributed to the bounded rationality of decision makers (Simon, 1991), increased administrative costs (Hashai et al., 2018), the excessive sense of urgency (Perlow et al., 2002), and the generated work stress and confusion among organizational members (Hecht & Allen, 2005).

Although the hypothesized curvilinear (i.e., inverted U-shaped) relationships were not statistically significant, I instead found a positive and direct relationship between frequency in strategic change and firm performance (see Model 5 in Table 16), and acceleration in strategic change and firm performance (see Model 6 in Table 16). I suspect one of the reasons why this

was the case is that my sample was SMEs and these types of firms are prone to liabilities due to their lack of resources. Thus, they may be extremely careful to make strategic changes because even a minor mistake can cause business failure. This rigorous practice may prevent them from making changes over their existing capacity. In other words, since they already know themselves very well, they may change only when a change is imperative, leading to direct effects on firm performance. Figure 10 depicts the specific practice for an additional change decision.

Figure 10

Managerial Perception for an Additional Change Decision



In a manager's cognitive map, they are likely to calculate their expected profit for change, the gap between the expected revenue for change and the expected cost for change. For those managers in established companies, Case 1, they may make an additional change decision although their expected profit is not much too high as they have ample resources (e.g., financial resources). Thus, in some cases, the additional change may have null or detrimental effect on the performance of established firms. On the other hand, those managers in SMEs, Case 2, they may want to make an additional change decision whenever they strongly believe that the change hugely increases their firm performance due to their limited resources. Likewise, this managerial practice of SMEs likely leads to higher firm performance with an additional change.

The relationship between polychronicity in strategic change and firm performance showed a standard U-shape (see Figure 8), not an inverted U-shape. The result implies that firm performance gradually increases as the number of simultaneous strategic changes increases. Yet, once polychronicity reaches a certain level, firm performance starts to increase exponentially with additional polychronic (more simultaneous) strategic changes. It may be possible that polychronicity requires a certain level before it can provide definite benefits to firms. Initially, as firms start to have strategic change projects closer together with shorter transitions, firms may have a difficult time juggling the demands of different projects. Managers and organizational members are likely to be stretched too thin. Because of this difficulty, firms would incur greater costs. However, at high levels of polychronicity, firms are likely to achieve cost advantages through economies of scope by sharing resources such as knowledge, experiences and core capabilities among the simultaneous strategic changes, which would lead to higher firm performance after a certain point.

Regarding the interaction effects on firm performance, I could not find statistical support for these relationships. I initially expected that for firms with high levels of eventfulness in strategic change, the positive relationship between regularity in strategic change and firm performance would be stronger. Drawing on the concept of improvisation (Crossan et al., 2005), I suggested that firms may proactively make changes to shape their environments while responding to changes from their environments (Crossan et al., 2005). However, unlike my expectation, the non-significant beta coefficient of the interaction term (see Model 4 in Table 16) implies that eventfulness does not positively moderate the relationship between regularity and firm performance. It is likely that because my sample consisted of SMEs and these firms have limited resources, these firms likely specialize on either responding to external changes consistently and making strategic changes accordingly or on proactively making strategic changes regularly regardless of events. Perhaps, doing both is difficult for these firms to have both rhythmic patterns simultaneously.

I also proposed that frequency in strategic change negatively moderates the relationship between acceleration in strategic change and firm performance, such that for firms with high levels of frequency, the positive relationship between acceleration and firm performance would be weaker. However, contrary to my expectation, Model 7 in Table 16 showed no statistical significance on the relationship. The reason could be because these two time-dimensions may not be clearly distinctive in the cognitive processing of respondents. While the two constructs are very clearly conceptually different as the car example indicated in Chapter 2, respondents may still consider them similar. Indeed, although discriminant validity among the time-dimensions was established in this study (see Table 10 and 11), a high correlation ( $r = 0.70, p < 0.01$ ) of frequency and acceleration would provide evidence.



Finally, the moderating effect of linearity in strategic change on the relationship between cyclicalness and firm performance was not supported (see Model 5 in Table 17). Based on the concept of ambidexterity, I suggested that firms making strategic changes that are both novel and unique, as well as strategic changes based on past experiences likely lead to superior performance due to increased strategic legitimacy, reduced search costs, and innovation effects. Probably, similar to the supporting argument made for the non-significant interaction effect between regularity and eventfulness in strategic change, the sampled SMEs likely specialize on either linearity or cyclicalness. They may have difficulty in pursuit of innovation for strategic change while revisiting their past change choices. As an evidence of my assumption, I indeed looked in the data and found that five SMEs (3%) pursued both linear and cyclical orientations in strategic change (only five SMEs were over a value of “6” for the summated scales of both linearity and cyclicalness). Therefore, it would not be enough to establish and test the moderating effect between linearity and cyclicalness in strategic change on firm performance.

## **6.2 Theoretical Contributions**

Theoretical contributions of this study to the emerging temporal research (e.g., Casillas & Moreno-Menendez, 2014; Klarner & Raisch, 2013; Kunisch et al., 2017; Hashai et al., 2018; Hopp & Green, 2017; Shin & Pérez-Nordtvedt, 2018) are multifold. First, this study incorporates a time lens (Ancona et al., 2001a) into strategic change research. Time, whether it is explicitly identified or not, plays a central role in human and organizational life, particularly when it comes to strategic change. Scholars have expanded the theoretical understanding of time in various research areas in strategy including internationalization (Casillas & Moreno-Menendez, 2014), mergers and acquisitions (Laamanen & Keil, 2008; Vermeulen & Barkema 2002), strategic

alliances (Hashai et al., 2018), strategic decision-making (Eisenhardt, 1989; Perlow et al., 2002), and diversification (Klaner & Raisch, 2013). Yet, time is particularly essential to conceptualize strategic change as the terminology of change alludes to the importance of time (Kunish et al., 2017). Therefore, I believe the use of a time lens in strategic change research provides a new way to understand temporal phenomena in organizations.

In line with the first contribution, this study explicitly develops various time-dimensions in strategic change. In reviewing multiple conceptions of time in strategic change research, a more comprehensive treatment of time is still missing. Thus, one of the primary arguments emerging from my assessment of the literature is the need to enrich and understand the dynamic temporal or rhythmic patterns of strategic change. To fill this research gap, I propose five time-dimensions through which the temporal patterns of a series of strategic changes are objectively mapped into the time continuum. These are: 1) regularity, 2) eventfulness, 3) frequency, 4) acceleration, and 5) polychronicity. In addition, and in an effort to be comprehensive in my treatment of time, I also propose two time-dimensions through which the temporal patterns of strategic change are subjectively interpreted: 1) linearity and 2) cyclicity. Although these time-dimensions, to some extent, overlap, empirical findings from both exploratory and confirmatory factor analyses provide evidence that each time dimension is separate and can be distinguished from the others. Therefore, these time-dimensions can help future scholars to give a more appropriate treatment to the overall time dimension and more accurately explicate the dynamic patterns of strategic change.

Third, prior studies on the speed of change have mainly focused on duration (Eisenhardt, 1989; Hopp & Greene, 2017) and timing (Huff & Robinson, 1994; Khavul et al., 2010; Lieberman & Montgomery, 1988) in a single change. Thus, understanding the role of time in a

series of strategic changes is relatively rare (Kunisch et al., 2017). This study extends this research stream by combining multiple time-related concepts such as transitions, durations, and timings to describe the various rhythmic patterns occurring when multiple and consecutive strategic changes take place. Although the five time-dimensions (i.e., regularity, eventfulness, frequency, acceleration, and polychronicity) may not represent every aspect of the objective time-dimension in a series of strategic changes, this study tries to shift the focus of the research stream from a single change to a collection of multiple strategic changes.

Fourth, this study redefines the rhythm of strategic change as a pattern of a series of strategic changes objectively mapped into the time continuum. To date, the rhythm of change has often referred to regularity addressing whether consecutive changes are either regular or irregular (e.g., Eisenhardt & Brown, 1998; Klarner & Raisch, 2013; Kunisch et al., 2017; Laamanen & Keil, 2008; Shi & Prescott, 2012). However, as evidenced, one can easily describe numerous rhythmic patterns in strategic change by looking at more than one dimension. Indeed, this study identified five time-dimensions by visualizing the patterns in the time continuum. Moreover, not only this study but also other scholars have initiated to explicate various rhythmic patterns in strategic change. For instance, George and Jones (2000) conceptualized “spirals” and “intensity” which could represent some other time-dimensions in strategic change. Also, Klarner and Raisch (2013) discussed several irregular patterns in the rhythm of change. Thus, the notion of rhythm should be used to explain a higher-order level of the time-dimension, not just regularity in strategic change. I believe that this redefinition of rhythm justifies ongoing scholarly effects to discover other temporal patterns of strategic change.

Fifth, this study provides the first insight into the performance implication of temporal strategy by highlighting the relative importance of objective interpretation of time. The full

multiple regression analysis, Model 12 in Table 16, provide evidence that, for the sampled firms (i.e., Korean SMEs), regularity ( $\beta = 0.189$ ,  $p < 0.01$ ) in strategic change is even more positively and significantly related to firm performance than eventfulness ( $\beta = 0.029$ ,  $p > 0.05$ ), frequency ( $\beta = 0.180$ ,  $p < 0.05$ ), acceleration ( $\beta = 0.105$ ,  $p > 0.05$ ), and polychronicity ( $\beta = 0.128$ ,  $p < 0.10$ ). Similarly but more clearly, in Model 12 in Table 19, the relative contribution of regularity ( $\beta = 0.320$ ,  $p < 0.05$ ) in strategic change to the second wave firm performance is quite critical compared to other time-dimensions, that are, eventfulness ( $\beta = 0.245$ ,  $p > 0.10$ ), frequency ( $\beta = 0.013$ ,  $p > 0.05$ ), acceleration ( $\beta = -0.130$ ,  $p > 0.05$ ), and polychronicity ( $\beta = 0.130$ ,  $p > 0.05$ ). Therefore, these findings suggest that firms should implement major changes with relatively equal time intervals based on predetermined deadlines for change to maximize their performance benefits.

Finally, this study develops new measures for various time-dimensions in strategic change to utilize primary data. Extant empirical studies on time in strategic change research have primarily used historical secondary data (e.g, Klarner and Raisch, 2013; Shi & Prescott, 2012). I admit that using secondary data to explicate dynamic rhythmic patterns of strategic change in a longitudinal fashion is relevant. Yet, survey measurement instruments generate additional value in helping management scholars and practitioners alike understand the top-level managers' perception regarding their strategic change patterns because strategic change management is also a subjective process of organizational sensory information. For instance, whether time is subjectively perceived as cyclical or linear by top managers may not be possible through secondary data. What secondary data can do is to provide a proxy to assess linearity or cyclicity at best. On the other hand, the measurement instruments developed here ask managers directly how they approach strategic changes through time (e.g., "my company finds new ways

to make major changes each time” and “my company makes major changes based on what we learned from past changes”). Likewise, the developed measurement instruments allow us to investigate actual firm behavior not an implicit assumption to predict the firm behavior.

### **6.3 Managerial Implications**

Empirical findings from this study provide important managerial implications for temporal strategy. Most of all, top-level managers should try to continuously make strategic changes, particularly in today’s ever-changing environments. A long-term strategic plan for temporal strategy makes each change more effective. While making strategic changes, managers are also encouraged to respond to changes from their internal and/or external environment such as competitors’ new product or service introductions, economic, legal, technological changes, labor strikes and so on. By doing so, they can loosen rigidity in organization scheduling and develop a more flexible sense of organization, combining deliberate and emergent strategies to achieve pace fit (Pérez-Nordtvedt et al., 2008) with environmental changes (Mintzberg & Waters, 1985).

Controversially, I suggest that change is better than stability. It may be true that making a series of changes frequently, fast, and simultaneously causes several adverse effects. In this regard, extant studies suggest that firms should find a right balance between change and stability (Hashai et al., 2018; Klarner & Raisch, 2013). However, it becomes a different story when SMEs and established firms are separately considered. The majority of businesses fail early in their life span (Sarasvathy, Menon & Kuechle, 2013). Arguably, they fail not because they do not balance between change and stability or because they overly change themselves beyond their existing capacity, but rather because they fail to change at all. In fact, most SMEs are relatively defensive

about changing, and thus have difficulties in changing. Likely, such anti-change approaches by SMEs lie on their limited resources and conservative practices. Therefore, firms, at least SMEs, should try to be active in their strategic change to survive, grow and further flourish in their business environments.

Finally, it is important to state that top-level managers who view time as a linear phenomenon should limit the use of the past in their current and future strategic change. In their cognitive map, these “linear” managers believe that the past barely contributes to the future and engage in learning from exploration. For firms led by these kinds of managers, innovative strategic change is the key to success. On the other hand, top-level managers who view time as a cyclical phenomenon should try to build strategic connections among the past, the present, and the future. In other words, they should act based on what they learned from their past experiences, solutions, and routines. “Cyclical” managers would be more effective leading firms operating in industries where managing cost is critical to determine the success of business.

#### **6.4 Limitations and Future Research**

A thorough review of this study suggests several limitations and possible avenues for future research. First, despite considerable personal effort and commitment dedicated to data collection, this study uses a sample of 172 SMEs to test hypotheses. With this limited sample, this study may not enjoy enough statistical power to find more significant results. Therefore, this study calls for future research testing the proposed hypotheses regarding the relationships between the various time-dimensions in strategic change and firm performance with a larger number of firms.

Second, this study suffers from the possible existence of CMV due to its cross-sectional research design. Although this study proactively deals with CMV with the procedural and methodological remedies, it is probable that at least some of the hypothesized relationships identified arise from CMV (Podsakoff et al., 2003). Therefore, this study urges future research to examine the relationships with either a longitudinal (i.e., separation of data collection across multiple time periods), an experimental, or a quasi-experimental research design for reducing the possible contaminating effects of CMV.

Third, this study only uses SMEs operating in Korea to test its hypotheses, hurting its generalizability to other contexts and types of firms. Thus, the sample does not represent the full scope of the nature of business. In other words, given the contexts of size- and country-specific, the performance implications may differ from those for more established firms operating in different countries. This is because larger and established firms are likely to take advantage of their resources (e.g., knowledge, experiences, financial, and human capital) and engage in more varied strategic changes. Also, firms in a specific country are likely to be influenced by the country's institutional norms, which often vary from country to country. Therefore, this study suggests further analyses of larger and more established firms from various countries, enhancing the generalizability of this study results.

Fourth, this study examines various time-dimensions in strategic change with primary data. Although the developed measures for the time-dimensions provide value to the literature to understand managerial perceptions regarding the rhythmic strategic change patterns, these subjective measures may not fully describe dynamic patterns in a series of strategic changes. Indeed, given the evidence from high correlations between frequency and acceleration ( $r = 0.70$ ,  $p < 0.01$ ) and frequency and polychronicity ( $r = 0.74$ ,  $p < 0.01$ ) in strategic change, it is possible

that some of the time-dimensions may not be clearly distinctive in the minds of respondents. Therefore, this study calls for future research to develop and test the measures for various time-dimensions in strategic change more objectively, probably with secondary data as understanding their effect on strategic change both in conjunction and separately needs to be disentangled. Alternatively, I suggest that future studies would benefit by using survey approaches where the different time-dimensions are collected in different points in time with a clear description of what each one is about. Similarly, future studies could refine the instruments to more clearly delineate the differences among the time dimensions.

Finally, as discussed earlier, this study acknowledges that there are more time-dimensions in strategic change. For example, Klarner and Raisch, (2013) identified three different patterns of irregularity in strategic change as “focused”, “punctuated”, or “temporary switching”. Moreover, George and Jones (2000) conceptually developed various time-dimensions such as “time aggregations”, “incremental vs discontinuous change”, and “spirals and intensity”. These prior scholarly efforts in the theoretical understanding of time suggest that there should be numerous time-dimensions which have not yet been identified or measured. Thus, future research should try to incorporate more dynamic patterns in strategic change both theoretically and methodologically.

## **6.5 Conclusion**

The management of time is a must in the execution of strategic change. Particularly, various time-dimensions become the central aspect of strategic change when a series of strategic changes exhibits a dynamic rhythmic pattern. Thus, with a sample of 172 SEMs operating in various industries in Korea, this study explores the performance implications of 7 time-



dimensions in strategic change occurring over time. Consequently, this study results provide valuable insights into strategic change research by determining the right timing for the execution of strategic change.

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## APPENDIX A

**Table 1. The Time-dimension of Strategic Change**

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Single Strategic Change	Duration	Eisenhardt, 1989	Strategic decision- making speed in high-velocity environments	It has a positive effect on firm performance	“Following prior research (Hickson et al., 1986; Mintzberg et al., 1976), I measured duration using the beginning and end times for each decision, with starting time indicated by the first reference to a deliberate action such as scheduling a meeting or seeking information and ending time indicated by the time at which a commitment to act was made.”
			Baum & Wally, 2003	Strategic decision- making speed	Strategic decision- making speed has a positive effect on firm growth but, not on firm profit	“Decision speed was measured as the average of three items (one for each of three scenarios) (alpha = 0.79): (1) 'Circle the approximate # of days it would take your organization to decide whether or not to invest significant time in pursuit of a merger with the Mills company (2, 5, 10, 20, 30, 60, 90, 120, 150, 180, more)’”
			Hopp & Greene, 2017	Duration of time spent on business plans	It has a curvilinear relationship between the length of time spent on a formal plan and new venture viability	"the difference between the month in which the founder began preparations for a business plan and when they completed a business plan"
			Casillas & Moreno- Menendez, 2014	Speed of internationalization process	Diversity of operation experience, a higher depth of market experience, a higher depth of operation experience have culvilinear relationship with internationalization speed	The speed of the internationalization process was calculated as the time between each operation and the one immediately thereafter (number of days).

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Single Strategic Change	Timing	Vermeulen & Barkema, 2002	A faster pace of foreign expansion	A faster foreign expansion pace negatively moderated the impact of a firm's foreign subsidiaries on its profitability	"Alternatively, speed can be measured through the variable 'number of years since the firm's first foreign expansion,' i.e., how many years it took the firm to reach its current international posture.
			Khavul et al., 2010	Speed of internationalization	They failed to support its effect on firm performance	"speed of internationalization was based on the age at which the firm had its first international sale."
			Makadok, 1998	First mover advantage	First movers in the money market mutual fund industry enjoy a pricing and market share advantage.	Dummy coded: whether the market was the first-mover, second-mover, third-mover, fourth-mover, or fifth-mover in its product category.
			Bergh & Lawlss, 1998	Timing of acquisition and divestiture	When product-market uncertainty increases, more firms are engaged in divestiture strategy than aquisition.	"Product-market uncertainty was measured as the volatility of the net sales of each firm's portfolio of four-digit SIC industries" and portfolio restructuring was defined as "a change in the firm's configuration of lines of business through acquisition and divestiture transactions"
			Chang, 1996	Timing of organizational search and selection activities	Poor firm performance triggers organizational search and selection activities. Thus, the poorer the performance, the more likely that	Firm performnce was measured based on return on asset. Then, with the logit model of entry decision, they tested the effect of performance gap on the entry decisions after controlling for knowledge applicability, industry and firm-level financial factors.

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series of Strategic Changes	Regularity in Strategic Change	Klarner & Raisch, 2013	Rhythm refers to strategic changes occur regularly (regular rhythm) or irregularly (irregular rhythm)	Regular change rhythm increases firm performance.	Strategic change refers to changes in a firm's domain of business. Following the definition, they coded 1 if diversification events happened in a given year. Next, irregular rhythm is categorized into four different concepts: <i>focused</i> in which long periods of change is interrupted by short periods of change (e.g., 1110111); <i>punctuated</i> in which long periods of stability is interrupted by short period of change (e.g., 0000100); <i>temporarily switching</i> combination of the two concepts above (e.g., 0111000); and <i>no change</i> (0000000).
			Laamanen & Keil, 2008	Variability of multiple acquisition rate	A high variability of the acquisition rate is negatively related to the acquirer's performance.	Acquisition rate variability was measured as the variability of average yearly acquisition rate over three years. They determined it "as the standard deviation of the yearly number of acquisitions.
			Hashai et al., 2015	regular alliance portfolio expansion rhythm	It (a) enhances the positive effects of a higher expansion speed on revenue generation, (b) decreases the positive effects of a higher expansion speed on managerial costs, and therefore (c) decreases the negative effects of a higher expansion speed on profitability.	We followed Laamanen and Keil (2008) and used the standard deviation of alliance engagement speed within the analyzed time frame to measure alliance portfolio expansion regularity. More specifically, we used the inverse of the standard deviation ( $1/s$ , where $s$ = standard deviation) as our measure

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series of Strategic Changes	Regularity in Strategic Change	Vermeulen & Barkema, 2002	Regular versus irregular rhythm of international expansion	"An irregular pace negatively moderates the impact of a firm's foreign subsidiaries on its profitability"	Irregular rhythm of "the internationalization process was measured through the kurtosis of the first derivative of the number of foreign ventures of the firm over time". It measures "how concentrated in time the change in the number of foreign subsidiaries is".
			Laamanen & Keil, 2008	Variability of multiple acquisition rate	A high variability of the acquisition rate is negatively related to the acquirer's performance.	Acquisition rate variability was measured as the variability of average yearly acquisition rate over three years. They determined it "as the standard deviation of the yearly number of acquisitions.
			Hayward, 2002	Regular versus irregular rhythm of acquisitions	when there are very long and very short intervals among acquisitions (irregularity), it reduces overall acquisition performance	the number of days among acquisitions.
			Brown & Eisenhardt, 1997	time-paced transition processes	Managing transitions from present to future. Predictable transition process is important as it helps to coordinate various tasks involving many people and resources. Moreover, it creates effective rhythm that can be entrained to the rhythm of environment. Thus, for example, a successful company was made to a new generation of the core product every 24 months.	Conceptual Paper

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series Strategic Changes	Eventfulness in Strategic Change	Pérez-Nordtvedt, 2008	"Entrainment refers to the synchronization of the tempo and/or phase of two or more activities within a system".	Firms that temporarily aligns its activities with environmental cycles achieve O-E temporal fit indicating efficiency, superior, and sustained firm performance.	Conceptual paper
			Pérez-Nordtvedt, 2014	Timing of strategic change intensions	Manager's strategic interpretation influences temporal adaptation (TA) intention. TA intention is moderated by the spatial distance. In addition, manager's interpretation, spatial distance also indirectly affects TA intention. Finally, TA intention is associated with higher firm performance.	TA intention: "(1) 'how long my business stays open each day'; (2) 'how many days my business operates during the week'; (3) 'how long my business's busy or peak season will be'; and (4) 'the number of hours employees will work'"
			Shi & Prescott 2012	different external forces hugely influence the formation of group behaviors	"Firms that extraentrain the rhythm of their acquisition initiatives with that of their competitors achieve high performance." "Firms that intraentrain the rhythm of acquisition activity with the rhythm of alliance activity achieve higher levels of performance"	"We define external competitors as those firms in our sample that are in the same stage of development as a focal firm." "The deviation score analysis method is based on a premise that the absolute difference between the scores of two variables indicates a lack of fit and the performance implications of fit is tested by examining the impact of this difference (Venkatraman & Prescott, 1990)."

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series of Strategic Changes	Frequency in Strategic Change	Klarner & Raisch, 2013	Frequency of strategic changes	Change frequency showed an inverted U-shaped relationship with firm performance.	"Change frequency was measured as the total number of strategic changes between 1995 and 2001."
			Hashai et al., 2015	Speed of alliance portfolio expansion	"the speed at which firms expand their alliance portfolios increases managerial costs disproportionately relative to revenues, leading to an overall negative effect on firm profitability". However, both alliance portfolio expansion regularity and duration reduce the managerial costs resulting from rapid alliance portfolio expansion.	The number of new alliances that a firm has established in a given year divided by the alliance portfolio size.
			Laamanen & Keil, 2008	The rate of acquisitions	higher acquisition rate is negatively associated with acquirer performance.	"the number of acquisitions that acquirers carry out over a given time period", specifically, as the average yearly acquisition rate during the focal and the preceding two years.

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series of Strategic Changes	Acceleration in Strategic Change	Perow et al., 2002	incremental decision making speed of new venture	A need for fast action has been traditionally conceptualized as an exogenous feature of a firm (i.e., rate of changes in external environments). However, it can also be a product of an organization's own past emphasis on speed. It ultimately lock the firm in the speed trap leading failure of the business.	Qualitative research
			Johanson & Kalinic, 2016	Accelerated internationalization process	They observed two cases of small-sized Italian firms in the manufacturing sector over 16 years and 22 years. Both firms illustrated that they accelerated the speed of foreign market expansion in terms the number of foreign markets entered at the beginning.	A case study

<i>Time-dimensions</i>			<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Objective Interpretation of time	A Series of Strategic Changes	Polychronicity in Strategic Change	Souitaris & Maestro, 2010	TMT polychronicity is an important concept because it helps to understand how top executives allocate their own time in strategic decision-making processes.	In the context of new technology ventures, TMT polychronicity is positively related to strategic decision speed, strategic decision comprehensiveness, and firm performance.	The scale items are “We believe people should try to do many things at the same time”, “We would rather focus on one project each day than on parts of several projects”, “We tend to juggle several activities at the same time”, “We think it is best and tend to complete one task before beginning another”, and “We believe it is best for people to be given several tasks”.
The Subjective Interpretation of time	Linearity in Strategic Change		Crossan et al. 2005	Linear time	“time is a linear phenomenon in which the past is never repeated and is always different from the future” “if the belief is that the relationship between the future and the past is a discontinuous one, then planners will be more concerned with preparing the organization for future contingencies.”	Conceptual paper
			Cunha, 2004	Linear time	“when an organization favours action over reflection, it mostly perceives time as a linear phenomenon” “the knowledge of what has gone before may be of little help to acting in the present or the future”	Conceptual paper



<i>Time-dimensions</i>		<i>Author(s)</i>	<i>Description</i>	<i>Findings</i>	<i>Measurement</i>
The Subjective Interpretation of time	Cyclicity in Strategic Change	Crossan et al. 2005	Cyclical time	<p>“In a cyclical view of time, the past is seen as occurring again and again. Corporate planners invest time detecting which past routines and action schemes are necessary in the present circumstances”</p> <p>“if there is a pervasive belief that the future has a continuous relationship with the past, then corporate planners will occupy their time with finding the best methods to extrapolate the former from the latter.”</p>	Conceptual paper
		Cunha, 2004	Cyclical time	<p>“When an organization favours reflection over action, it mostly perceives time as a cyclic phenomenon.”</p> <p>“a cyclic perception of time is more likely to be popular in organizations having an orientation towards planning, because these tend to see this process as a way of successfully handling future and present challenges by drawing on knowledge about the past”</p>	Conceptual paper

## APPENDIX B

### Survey Items Used to Measure Study Variables

#### Major Changes in Organizations

*Please carefully read this page before answering the questions!*

The purpose of this study is to investigate major changes made by companies. By participating in this study, you will be contributing to research that will provide managers with practical information on how to run a successful business. Your participation in this study is completely voluntary. If you choose to participate, it will take you about 15 minutes to complete the survey.

**Please know that there is no risk and none of your individual responses to the survey will ever be shared with anyone.** Collected data will only be presented in an aggregate format, such that no individual responses can ever be identified.

Taking part in this study is your choice. You are free not to take part or to stop at any time for any reason. No matter what you decide, there will be no penalty or loss of benefit to which you are entitled.

You can contact us with any concerns or questions about the research at [kilho.shin@uta.edu](mailto:kilho.shin@uta.edu) or at [lnordtvedt@uta.edu](mailto:lnordtvedt@uta.edu) (English only). If you want to speak with someone not directly involved in this research study, you may contact the University of Texas at Arlington's IRB through the Office of Research Administration; Regulatory Services at 817-272-3723 or [regulatoryservices@uta.edu](mailto:regulatoryservices@uta.edu). You can talk to them about: your rights as a research subject; your concerns about the research; and a complaint about the research.

We would like to thank you in advance for your help with this important research.

Regards,

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## **Major Changes**

*In the course of their operations, firms make major changes. Major changes can be any of the following (1) the introduction of new products or services; (2) the replacement of a top executive (president or CEO); (3) the building of a major new facility; (4) the adoption of a significantly different production technology; (5) a change in distribution, promotion, or pricing strategies and techniques; (6) the modification of organizational structure and the distribution of authority; (7) acquisitions, mergers, or alliances; (8) the addition of new departments; or (9) the modification of administrative practices to espouse corporate policies and goals.*

*When answering the following questions, please think about the major changes your company has engaged in over the last three years.*

### **Sequence of Major Changes (Polychronicity)**

*Please select your level of agreement with the following statements (Q1 - Q5)*

Scale: 1= strongly disagree to 7 = strongly agree

1. My company made major changes at the same time
2. My company initiated subsequent major changes before completing prior ones
3. My company started major changes while still working on previous changes
4. My company did not have transition periods between major changes

### **Regularity of Major Changes (Regularity)**

*Please select your level of agreement with the following statements (Q1 – Q6)*

Scale: 1= strongly disagree to 7 = strongly agree

1. My company made major changes with relatively equal time intervals (e.g., every month, every 2 quarters, once a year, etc.)
2. My company made major changes on a consistent basis
3. My company made major changes on a relatively regular basis
4. The time between each major change was about the same
5. Timings of major changes were unpredictable

*When answering the following questions, please think about the major changes your company has engaged in over the last three years. Major changes can be (1) the introduction of new products or services; (2) the replacement of a top executive (president or CEO); (3) the building of a major new facility; (4) the adoption of a significantly different production technology; (5) a change in distribution, promotion, or pricing strategies and techniques; (6) the modification of organizational structure and the distribution of authority; (7) acquisitions, mergers, or alliances; (8) the addition of new departments; or (9) the modification of administrative practices to espouse corporate policies and goals.*

### **Events and Major Changes (Eventfulness)**

*Please select how often your company engaged in the following statements when making major changes over the last three years (Q1 - Q5)*

Scale: 1= Never to 7 = Very often

1. My company made major changes in response to events (e.g., my competitor's new product or service introduction; economic, legal, technological changes; labor strike; etc.)
2. My company initiated major changes every time there was an event
3. Events led our company to implement major changes
4. My company started major changes when events occurred
5. My company made major changes regardless of events

### **Frequency of Major Changes (Frequency)**

*Please select your level of agreement with the following statements (Q1 - Q4)*

Scale: 1= strongly disagree to 7 = strongly agree

*Over the last three years:*

1. My company initiated major changes often
2. Many major changes were started by my company
3. My company frequently made major changes
4. My company made very few major changes

### **Learning and Major Changes (Cyclicity)**

*Please select your level of agreement with the following statements (Q1 - Q5)*

Scale: 1= strongly disagree to 7 = strongly agree

1. My company makes major changes based on what we learned from past changes
2. When implementing major changes, my company heavily relies on prior solutions and routines
3. When implementing major changes, my company counts on prior experiences
4. My company barely learns new knowledge when we make major changes
5. My company uses forecasting when initiating major changes

*When answering the following questions, please think about the major changes your company has engaged in over the last three years. Major changes can be (1) the introduction of new products or services; (2) the replacement of a top executive (president or CEO); (3) the building of a major new facility; (4) the adoption of a significantly different production technology; (5) a change in distribution, promotion, or pricing strategies and techniques; (6) the modification of organizational structure and the distribution of authority; (7) acquisitions, mergers, or alliances; (8) the addition of new departments; or (9) the modification of administrative practices to espouse corporate policies and goals.*

### **Speed of Major Changes (Acceleration)**

*Please select your level of agreement with the following statements (Q1 – Q5)*

Scale: 1= strongly disagree to 7 = strongly agree

1. My company implemented major changes in an increasing fashion
2. The time between each major change became shorter
3. My company accelerated the implementation of major changes
4. My company implemented major changes in an accelerated way

### **Innovation and Major Changes (Linearity)**

*Please select your level of agreement with the following statements (Q1 – Q4)*

Scale: 1= strongly disagree to 7 = strongly agree

1. My company finds new ways to make major changes each time
2. At my company, major changes require creative solutions
3. My company's major changes can be considered as being out of the box
4. Major changes are novel and unique at my company

*Please select the major changes your company engaged in the last three years (select all that apply):*

1. The introduction of new products or services
2. The replacement of a top executive (president or CEO)
3. The building of a major new facility
4. The adoption of a significantly different production technology
5. A change in distribution, promotion, or pricing strategies and techniques
6. The modification of organizational structure and the distribution of authority
7. Acquisitions, mergers, or alliances
8. The addition of new departments
9. The modification of administrative practices to espouse corporate policies and goals.

## **Firm Performance**

Scale: 1= much worse to 7 = much better

*When compared to you competitors, how would you rate your company according to:*

1. Return on sales (ROS).
2. Return on investment (ROI).
3. Reaching financial goals.
4. Growth in sales revenue.
5. Overall firm performance.

## **General Information**

*Please fill out in the blank in the following questions (Q1 - Q2)*

1. My company has been in operation for \_\_\_\_\_ years.
2. My company has \_\_\_\_\_ numbers of employees.

*Please select the box that applies to you (Q1 – Q7).*

3. I am a key decision maker in my company
4. I am the owner
5. Please check industry where your company operates  
Service Industry or Manufacturing Industry
6. How many years has your company been doing business internationally?

Thank you very much!