

Article

Managing Growing Pains for the Sustainable Growth of Organizations: Evidence from the Growth Pathways and Strategic Choices of Korean Firms

Yeongjun Yeo ¹ and Chansoo Park ^{2,*}

¹ Technology Management, Economics, and Policy Program, College of Engineering, Seoul National University, Gwanak-gu, Seoul 151-742, Korea; yyj913@snu.ac.kr

² Science and Technology Policy Institute (STEPI), 370 Sicheong-daero, Sejong-si 30147, Korea

* Correspondence: pcs1344@stepi.re.kr; Tel.: +82-44-287-2165; Fax: +82-44-287-2068

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Abstract: Life-cycle literature suggests that business organizations evolve in consistent and predictable manners, implying that organizational structures and strategies evolve as firms move through growth stages. The sustainable growth of firms involves successful transitions between growth stages through managing different types of organizational growing pains and maintaining sustainable competitive positions, suggesting shifts in the strategic orientation of the firms as the firms grow. Based on this approach, this study proposes a holistic framework to account for linkages between determinants of a firm's growing pains and key areas of organizational development, based on a synthesis of qualitative and quantitative findings. From statistical analyses, Korean firms are found to have proceeded through distinct stages of growing pains as they reached organizational sizes as follows: 20, 100, 300, and 500 million USD in sales revenue. Furthermore, qualitative findings suggest that business strategies evolve to deal with different types of growing pains in life-cycle stages from the systemization of management system to the revitalization process. Our results expect to provide extensive knowledge on the role of strategic management to deal with firm's growing pains, considering both internal and external factors governing organizations. Furthermore, this study expects to provide an insightful and practical framework for managing organizational growing pains and transitions required to build sustainably successful organizations.

Keywords: firm's growth; growing pains; growth stage; business strategy; sustainable growth

JEL Classification: D20; L20; M10

1. Introduction

Organizational life-cycle models suggest that the development of any business organization tends to follow predictable patterns [1,2]. One of the key assumptions underlying life-cycle models is that there are regularities of organizational development process, which can be segmented into discrete stages from birth to death like every living organism [3–5]. It also refers to the expected sequences of advancements experienced by an organization, as opposed to a randomized occurrence of events. Another assumption is that organizational structures in one stage are not same as those in other stages. Thus, each stage of growth would have different sets of challenges under different operating contexts.

Firms face different sets of internal and external environmental variables as they move from one to another stage of growth. External variables include shifts in demand, in technology or in competitive circumstances, while internal variables describe the conditions of a firm's resources, capabilities, and internal organizational system. Changes in the external and internal mix of problems for companies provide different sets of strategic challenges [6–13]. As a result, organizations

encounter some degree of difficulties in managing a transition process between stages of growth. When the transition from one to the next growth stage has not been made successfully, firms tend to experience organizational “growing pains” [14–18]. Growing pains are problems that occur as a result of inadequate organizational development in relation to business size and the complexity of external environments at a given stage of growth. These growing pains are described as symptoms of organizational distress and indications of the need to change, if the organization wants to continue to operate successfully [14,19,20]. In other words, organizational growing pains are signals about the necessity for strategic organizational development to ensure sustainable growth of business organizations.

So far, a variety of literature on organizational analysis and design has investigated changing characteristics of organizations in different stages. However, a historical bias in literature on organizational life-cycles and growth stages has been the tendency to generate studies that focus on the static characteristics of growth stages. As for the previous studies on the concepts of growth stages of firms, a large number of studies [5,21–37] propose life-cycle models of organizations in order to account for the growth patterns of firms. Different authors have emphasized somewhat unique sets of organizational characteristics and life-cycles models. Those studies commonly suggest that a firm’s growth can be segmented into discrete stages as follows: birth, growth, maturity, revival, and decline. Based on this approach, they have tried to examine different characteristics of each stage of growth. However, those studies assuming that a firm’s growth as a set of discrete stages are considering that the firm’s growth is an uninterrupted process lacking considerations on the transition process (i.e., transition failures) between growth stages, which hinders in-depth descriptions on the dynamic growth trajectories of firms.

Recently, however, several studies have tried to examine this transition process between growth stages by incorporating the concept of organizational growing pains [14–16,38–46]. For example, Flamholtz and Randle [15] address that a dis-equilibrium state of the organizational development in which an organization’s internal infrastructure is not consistent with its size resulting in different types of transition pains. Based on this approach, several studies have investigated different types of organizational growing pains, and underlying causes of growing pains [14,15,39,43–45]. However, those studies largely focus on the internal structure of the business organization (i.e., organizational structures and processes that influence worker behavior and motivations), and its relationships with the firm’s growth stage. There have been few studies that put an emphasis on aligning business organizations with their rapidly changing and complex environments through strategic management to deal with growing pains. As there has been a lack of consideration of external environmental variables such as shifts in demand, in technology or in competitive circumstances, these studies have been limited in providing implications on the formulation of strategies to deal with a successful transition process between growth stages. In order to tackle down underlying determinants of the growing pains of firms, there should be in-depth discussion on changes in the external and internal mix of problems faced by firms and their relationship with growth challenges.

Furthermore, previous studies that investigate a firm’s growth stages and organizational growing pains are rather fragmented, and largely limited to theory-building. Accordingly, there have been few attempts to investigate the growth patterns of firms including growth stages, and growing pains of firms, by applying theories to specific countries or industries. Few attempts have been made to account for growth trajectories/patterns of firms in quantitative manners to validate these various frameworks. To inform practical leaders and managers of companies on how to deal with growing pains for the sustainable growth of business organizations, it is also essential to test theories and apply concepts in order to analyze practice. Unfortunately, however, very few research studies have examined the underlying causes for organizational growing pains, and those that investigated this topic have not focused on real cases, being limited in their practical implications for both organizational and management development research.

Considering these limitations of previous studies, this study aims to propose a holistic framework to account for growth trajectories of firms in terms of the transition process between growth stages and growing pains encountered by firms. The academic institution behind this approach is that a firm's sustainable growth over the long term involves a dynamic process incorporating periods of growing pains, and a successful transition process, which is not described as a series of distinctive discrete stages [47]. In developing a conceptual framework, this study extends the definition of organizational growing pains beyond the previous literature. We define organizational growing pains as "transition failures resulting from inadequate organizational development in relation to business size and complexity of the external environment at a given stage of growth". Based on this extended definition of organizational growing pains, we investigate the underlying causes of organizational growing pains encountered by Korean firms, and the key developmental areas of organizational development required to deal with growing pains. As a result, we highlight the importance of the formulation of business strategies to align a firm's internal infrastructure with their rapidly changing and complex environments in dealing with organizational growing pains.

To be specific, we synthesize two approaches in developing a conceptual framework to account for linkages between determinants of a firm's growing pains and the formulation of business strategies in terms of key areas of organizational development. The first approach is to identify quantitatively and explore stages of growing pains encountered by Korean firms from the 1990s to 2010s using the statistical analysis of 1788 companies in Korea from 17 industries between 1990 and 2013. Based on quantitative findings drawn from the statistical analysis, we formalize the proposed conceptual framework to account for a business organization's life-cycle in terms of organizational growing pains and key developmental areas with the consideration of the industry-specific and institutional conditions of Korea. The second approach is to examine case examples to highlight the importance of firm's strategies in dealing with organizational problems appropriately in order to overcome growing pains. Through the case studies, we will explore the underlying causes of the growing pains encountered by Korean firms from the 1990s to 2010s, focusing on external and internal factors, and highlight the importance of the business management strategies to overcome growing pains. From the case studies, we stress the importance of strategic management to overcome growing pains during the growth paths of firms. Based on the qualitative findings drawn from the case studies, we expect to offer evidence to complement and enhance the accountability of our proposed framework.

Different sets of internal and external environmental variables governing the business organizations result in different types of challenges and transition failures that firms are likely to meet as they proceed to the next stages of growth. From this perspective, we argue that the sustainable growth of firms involves successful transitions between growth stages through managing different types of organizational growing pains and maintaining sustainable competitive positions. In other words, this suggests shifts in the strategic orientation of the firms as the firms grow. Therefore, it is important for managers and founders of companies to understand the different aspects of the transitions over the life-cycle of business organizations in order to secure the sustainable growth of firms. Our study is significant, in that it is devoted to an analysis where theories are put into practice by suggesting a new conceptual framework based on a synthesis of qualitative and quantitative findings. Ultimately, this study expects to provide comprehensive insights for managers to understand the underlying causes of growing pains and to proactively determine effective measures to continue to grow organizations successfully.

The rest of the paper is structured as follows: Section 2 provides descriptions of the statistical data analysis and our proposed framework; Section 3 presents case studies for companies to provide extensive explanations on the role of strategies to deal with growing pains; and lastly, the summary and concluding remarks are provided in Section 4.

2. Quantitative Methods and Findings

2.1. Data and Methodology

As a first step for quantitatively identifying the growing pains of firms, we collected firm-level data from Total Solution 2000 (TS2000) of Korea Companies Information (KOCOinfo, Seoul, Korea) provided by the Korea Listed Companies Association. The KOCOinfo database provides a short company profile, some basic firm information (e.g., establishment year, ownership and management structure), a set of general financial figures (e.g., equity capital, market capitalization), and a set of time-variant indicators that are usually reported on an annual basis (e.g., number of employees, revenue). We use additional data sources from a repository of Korea's corporate filings provided by the Financial Supervisory Service's (FSS) of the Data Analysis, Retrieval and Transfer System (DART, Seoul, Korea) to complete the missing data in our sample. Based on these raw data sources, we construct datasets on an annual basis which contain information on 1788 companies from 17 industries from 1990 to 2013.

Even though a number of studies have tried to examine a firm's growth by calculating actual growth in annual revenues applied to actual data on annual basis [36,48,49], this approach has a high possibility to entail outlier problems with high volatility in actual growth in annual revenues. Accordingly, we apply the Hodrick–Prescott (HP) filtering technique to calculate smoothed trends of a firm's revenue growth. The HP filter is a spline-smoothing method to identify the trend effects based on the assumption that the time-series effect can be decomposed into a trend component and a cyclical component [50] (The HP filtering method assumes that time-series variable (y_t) can be decomposed into a trend component (τ_t) and a cyclical component (c_t), such that $y_t = \tau_t + c_t$. This algorithm smooths the original time-series y_t to estimate its trend components, τ_t by solving the following equation: $\min_{\tau} \left(\sum_{t=1}^T (y_t - \tau_t)^2 + \lambda \sum_{t=2}^{T-1} [(\tau_{t+1} - \tau_t) - (\tau_t - \tau_{t-1})]^2 \right)$. The value of λ determines the degree of penalizing the cyclical component, and we set the level of $\lambda = 100$ in this study). The data-smoothing method has been widely used to remove the effects of measurement error and reveal the underlying trend in the data. The HP filtering method has been used extensively in applied economics to detrend data, particularly to assist in the measurement of business cycles [51,52].

Applying this methodological approach, we examine the growth paths of firms through smoothing the actual growth rates of firms' revenues. For the analysis, we use the three-year moving averages of annual revenues of firms when calculating annual growth rates of firms' revenues. The moving-average method is useful in smoothing a time-series to see its trend, and measuring the seasonal fluctuations in the actual data. To avoid outlier problems with high volatility in actual growth in the annual revenues of firms, we apply the moving-average method and HP filter method for the analysis. We exclude companies with missing values for the annual revenues over four years from the sample. After excluding companies with missing data from the sample, we conduct statistical analyses for 745 companies in the sample, based on time-series sales revenue information from 1990 to 2013. In addition, we have tried to reclassify the companies in the sample into nine industries for simplicity in the analysis. (We consider nine industrial sectors consisting of six manufacturing sectors and three non-manufacturing sectors (i.e., manufacturing sectors: (1) Food products and beverages; (2) Textiles, sewn wearing apparel, pulp, paper and paper products; (3) Chemical products except pharmaceuticals, medicinal chemicals; (4) Pharmaceuticals, medicinal chemicals and botanical products; (5) Transport equipment, metal products, and non-metallic mineral products; and (6) Electronic components, optical instruments and electrical equipment; non-manufacturing sectors: (7) Electricity, gas, steam, water supply, and construction; (8) Wholesale, retail trade, information and communications; and (9) Other services sectors.) The brief information on descriptive statistics of the sample is presented in Appendix A.

To trace the growing pains encountered by firms as they pass through growth stages, firstly we have plotted the annual growth rates of sales revenues of firms in terms of their organizational sizes in a longitudinal manner. Following other studies' [48,53–56] approaches, the size of annual revenues earned

by each firm is used as a proxy variable to describe the firm's size. One of the key underlying assumptions behind this methodological approach is that organizational problems tend to change markedly as firms' sizes increase [30]. After plotting the smoothed trends of annual growth rates of sales revenue in relation to the organizational sizes of firms in the sample, we consider the inflection point (i.e., period) of declination and stagnation of sales growth rates as the periods of growing pains encountered by firms. When sales revenue of the firm or its growth rate falls, we consider that the growing pain stage is observed. On the other hand, when the annual growth rates of sales revenue increase after stages of growing pains, we consider those firms having overcome their organizational growing pains.

The growth rates of sales revenues are one of conventional indicators that represent the abilities of firms to maintain/reduce/increase the level of their market competitiveness [57–60]. In addition, this indicator is described as the outcome and the measure of effectiveness of business organizations associated with the conditions of firms' strategies aligning their internal infrastructure with external environments [57]. Furthermore, the inflection point of the growth rates of sales revenues can be understood as signals that affected firms must make certain fundamental changes with the formulation of strategies in order to continue to growth and proceed to the next growth stages. In this study, we extend the definition of the organizational growing pains by defining it as a transition failure resulting from the inadequate organizational development in relation to business size and the complexity of the external environment at a given stage of growth. Accordingly, we think it is reasonable to consider the inflection point (i.e., period) of declination and stagnation of sales growth rates identified from the statistical analysis as the periods of growing pains encountered by firms.

Based on mathematical approaches, the inflection points are defined as the points (i.e., periods) of the curves, where the directions of curves change in response to specific events. This methodological principle is applied to the changes of annual sales revenues of Korean firms from the 1990s to 2010s. As the growth rates of annual sales revenue are already the "first derivatives" of each firm's annual sales revenue, so changes in the growth rates of annual sales revenue are the "second derivatives". From this perspective, the inflection points of firms' sales revenues can be defined as regions where the second derivatives of firms' annual sales revenues are equal to zero, which describe the points at which the curves (of firms' sales revenues from 1990s to 2010s) changes from being concave to convex or vice versa. In other words, we have identified both rising points of inflection where the first derivatives of firms' annual sales revenues have local minimums, and falling points of inflection where the first derivatives have local maximums. Accordingly, it can be understood that the periods of growing pains experienced by Korean firms are measured by identifying the inflection points (i.e., regions) of firms' sales revenue, as presented in Figure 1. In addition, based on this approach, we sought to explore the typical periods of growing pains where Korean firms have inflection points in the growth of sales revenues.

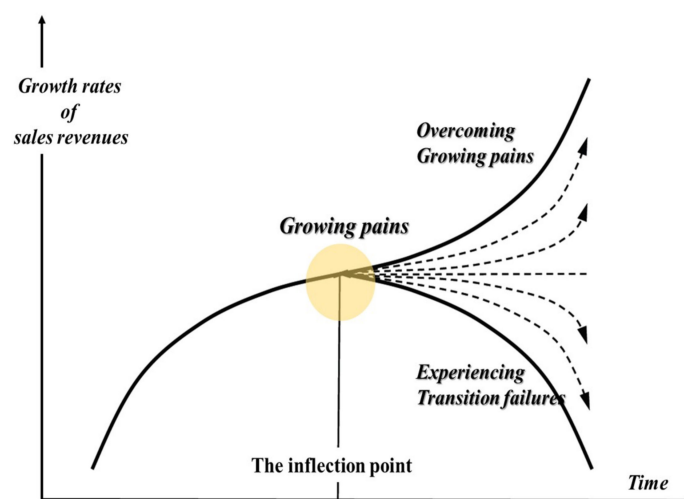


Figure 1. The concept of growing pains in the quantitative analysis.

2.2. Key Findings on Stages of Growing Pains

Based on these assumptions for the statistical analysis, we plot smoothed trends of annual growth rates of sales revenues in accordance with organizational sizes of firms in the sample using the HP filter method. Our HP filtering analysis suggests that growing pains tend to appear as Korean companies reach organizational sizes of around 20, 100, 300, and 500 million USD in terms of sales revenue. Each stage of growing pains found in an inflection point of stagnation or declination of revenue growth is strongly associated with the growth trajectories of firms. Organizational growing pains might be signals that organizations have reached new stages in their development and must make major, qualitative changes. In this regard, each stage of growing pains should be understood in accordance with the external and internal variables governing the growth stages, as well as the phase of organizational development. Awareness of both internal factors and external conditions in each stage of growth can help us understand the origin and underlying causes of growing pains. Considerations on industry-specific and institutional conditions of Korea are also reflected in our interpretations on each stage of growing pains.

2.2.1. The First Stage of Growing Pains: 20 Million USD of Company Size

We first categorize firms that experience growing pains with revenue of around 20 million USD by identifying firms whose annual revenue growth rates are shown to plateau at about 20 million USD in organizational sizes. Figure 2 depicts those representative firms identified by HP filtering analysis that experience growing pains with revenue of around 20 million USD. In Figure 2, the *x*-axis refers to organizational sizes in terms of sales revenues, and the *y*-axis represents annual growth rates of the revenues of each firm. Accordingly, this captures the growth paths of firms which are found to have experienced the first stage of growing pains (20 million USD).

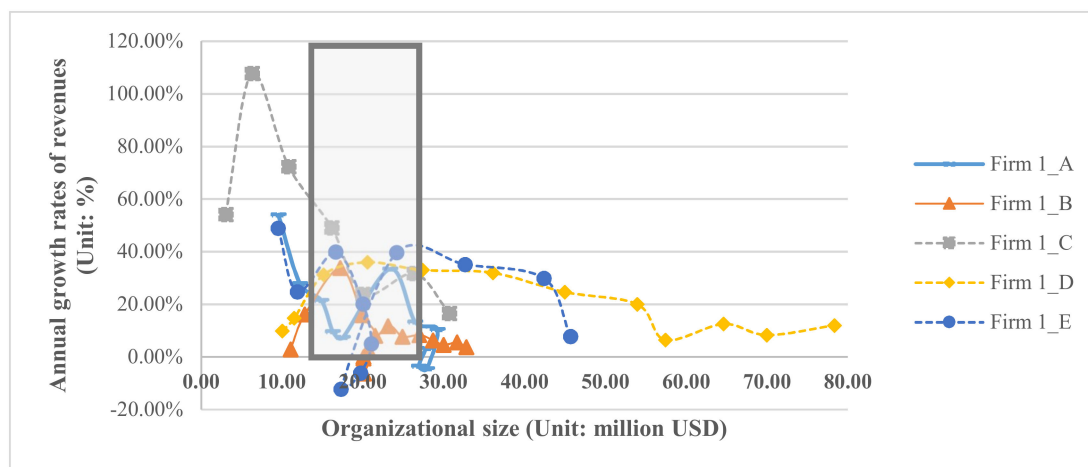


Figure 2. Organizational growing pains by company size (sales revenue): 20 million USD.

From the analysis, it can be seen that those companies experiencing the first stage of growing pains are those that emerged as technology oriented start-ups in industries such as energy, IT and biotechnology (Firms 1_A, 1_B, 1_C, 1_D, and 1_E in Figure 2). It is common for such start-ups to show higher annual growth rates of revenues than other companies. Technology oriented start-ups are entrepreneurial ventures that are typically newly emerged, and fast-growing companies, and thus they tend to experience rapid growth in the early stages by gaining competitive edges through technological advantages, and generating rapid growth potential [61]. One of the main reasons for firms that have grown from technology-oriented start-ups to have experienced growing pains is associated with the fact that those have not developed their internal organizational structures properly in line with rapid growth phases of organizational sizes, sufficient to bring these problems under a greater degree of control, as discussed by other studies [62–64].

In other words, there is a high possibility that the resources and capacity within the organization that can support the growth rate of the company would be limited and managed ineffectively. If a proper foundation for scaling from a start-up stage has been established, the firm will be positioned to ride the momentum of an expanding market as far as and as fast as is competitively achievable. If not, organizational growing pains lie ahead [65]. During the start-up stage, entrepreneurial ventures are heavily dependent upon informal, even intuitive decision-making process. As the firms grow, however, this informal communication and decision-making processes becomes unwieldy. The rapid growth of the entrepreneurial ventures places considerable demands on the functional specialists and operational systems [63,65,66]. Therefore, the main challenges for those firms are to ensure that internal control and management systems are developed and coordinated systematically, in line with the rapid growth of organizational sizes.

In addition, firms grown from technology-oriented start-ups to mid-sized firms would have been excluded from benefits received at the stage of start-ups [67]. It is expected that those companies would have felt the limitations of their existing internal control systems, as incentive offerings from governments are reduced because they made the transition from start-ups to mid-sized enterprises. Accordingly, we can expect that critical tasks for the majority of companies experiencing the first stage of growing pains are related to the systemization of management systems, and organizational innovation. In other words, it can be inferred that the key strategic choices for companies to overcome growing pains at 20 million USD in organizational sizes are focused on implementing new organizational methods in undertaking business practices, and developing newly established management systems required to make transitions toward the next stage of growth.

2.2.2. The Second Stage of Growing Pains: 100 Million USD of Company Size

Our HP filtering analysis suggests that growing pains tend to increase in severity as companies reach revenue sizes of about 100 million USD, which can be described as the second stage of growing pains faced by Korean firms. Figure 3 presents examples of organizations that have made the transition to the next phases of growth successfully, as well as others that have failed to make this transition at revenue levels of around 100 million USD. From the analysis, it is found that the majority of companies that experienced the second stage of growing pains are those in the electrical, and machinery equipment industries.

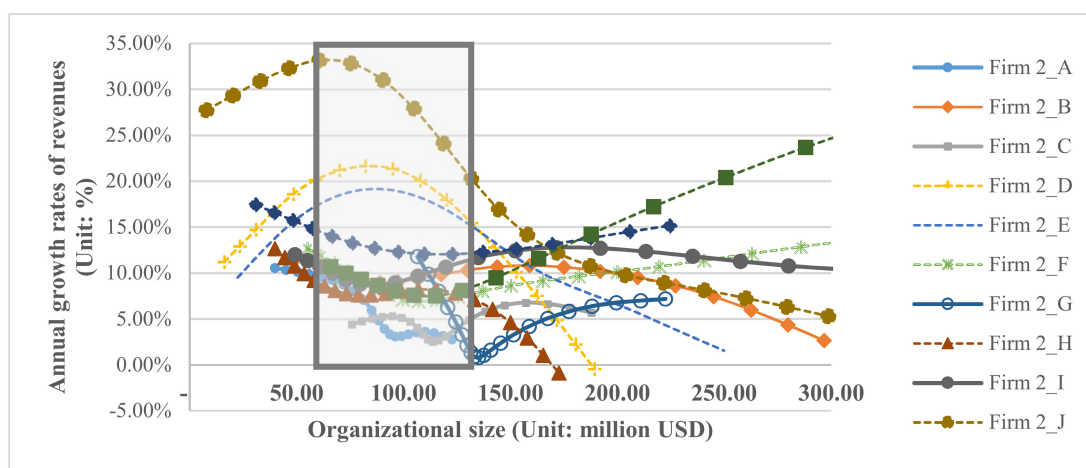


Figure 3. Organizational growing pains by company size: 100 million USD.

Those firms are found to have already achieved maturity stages with consolidated positions in their markets as mid-sized firms, unlike companies that experienced the first stage of growing pains. The challenges posed to companies after the attainment of organizational maturity, as well as their strategic choices to overcome growing pains are quite different from those of organizations that are

found to have experienced the first stage of growing pains. As noted by Flamholtz and Randle [14], companies typically attempt to diversify product lines after the maturity and consolidation stages, either because the organization's product life-cycle has reached maturity as a result of market saturation, or because the core products have created new opportunities.

We can infer that after the consolidation stage of growth, firms are likely to face increased competition in the market and inevitably attempt to gain competitive advantages with the development of new products [68–71]. The presence of competition decreases the firm's profit margins and erodes its market share over time, resulting in growing pains experienced by companies with consolidated market positions. Especially for companies whose businesses are focused on products in fast-moving markets (e.g., high-tech industries including electronic, and machinery equipment industries), sourcing necessary resources for the development of new products is one of the important tasks to enter niche markets. Therefore, it can be understood that for those companies that pass through the second stage of growing pains, key developmental challenges are associated with the development of new products for niche markets and acquisition of necessary resources for it. Accordingly, we can infer that those firms with the second stage of growing pains could have difficulties in acquiring resources and developing core capabilities to diversify product lines, and explore new markets for products, having been locked in routines associated with the development of the companies' original products or product lines.

2.2.3. The Third Stage of Growing Pains: 300 Million USD of Company Size

Our HP filtering analysis also suggests that the third stage of growing pains experienced by Korean firms tends to appear when firms reach approximately 300 million USD in annual sales. Figure 4 illustrates representative firms that experienced growing pains, at around 300 million USD in revenues identified from HP filtering analysis.

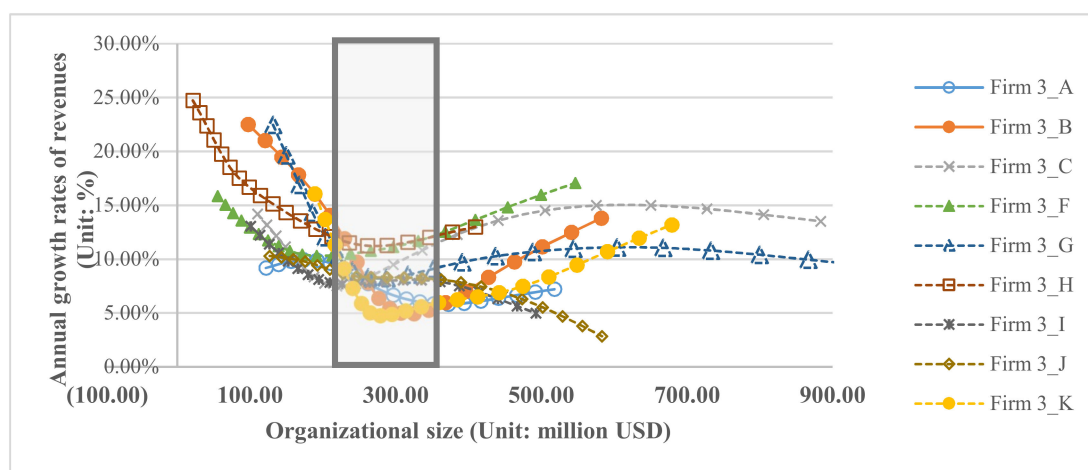


Figure 4. Organizational growing pains by company size: 300 million USD.

Most companies that are found to have experienced the third stage of growing pains are those in the wholesale and retail trade, and iron and steel industries. Those firms are also found to have already achieved organizational maturity stages. Diversification strategy is also highlighted for them to achieve the transition process towards the advanced stages of growth after the consolidation stage of growth, like companies that are found to experience the second stage of growing pains. Along with the development and introduction of new products through acquiring new resources and developing complementary assets, diversification might also be achieved by exploring potential markets and entering additional markets for existing products [14,15].

As mentioned earlier, companies in the wholesale and retail trade, and iron and steel industries are found to have encountered the third stage of growing pains. Those industries are major export-oriented

industries in Korea, and described as mature and well-established industries. Many key firms in the iron and steel industry have built reputations for themselves as specialists in niche markets with established core technological competencies. On the other hand, with saturation of the domestic market and a push for internationalization it can be tempting for companies in the wholesale and retail trade industry to focus on outward investments. Those facts highlight the importance of a firm's capabilities in identifying and effectively entering new markets with market knowledge. Outward investments provide opportunities to expand businesses in markets with higher growth potential. From HP filtering analysis, we find that most companies that experienced the third stage of growing pains had difficulties exploring new markets for their existing products, entering new potential markets, and expanding their market shares.

Accordingly, we infer that most Korean companies that experienced the third stage of growing pains have faced organizational problems caused by external conditions, such as saturation of the domestic market and less global demand with the global economic crisis, and by internal conditions, including lack of marketing capabilities and capabilities to secure marketing channels. Thus, firms under such situations can make strategic choices to enter new potential markets and expand niche markets. Indeed, we find that the firms shown in Figure 4, which overcame growing pains with revenues around 300 million USD, actively attempted to diversify their businesses so they were no longer dependent on their original markets.

2.2.4. The Fourth Stage of Growing Pains: 500 Million USD of Company Size

We also categorize firms that experienced their growing pains at around 500 million USD in revenues (4th stage of growing pains), and find that those representative companies (Firms 4_A, 4_B, 4_C, 4_D, and 4_E in Figure 5) are in the chemicals and chemical products industry, which is a capital-intensive industry. Those are also found to have maintained their businesses with well-established organizational foundations for longer periods than other firms. In addition, those are mature companies who had maintained a steady growth in their organizational sizes before they encountered stages of growing pains. Key developmental challenges for those companies that passed the fourth stage of growing pains are associated with their stages of decline and revitalization [14]. Despite their profound volume of assets and revenues, those firms are found to have faced the need for organizational revitalization efforts.

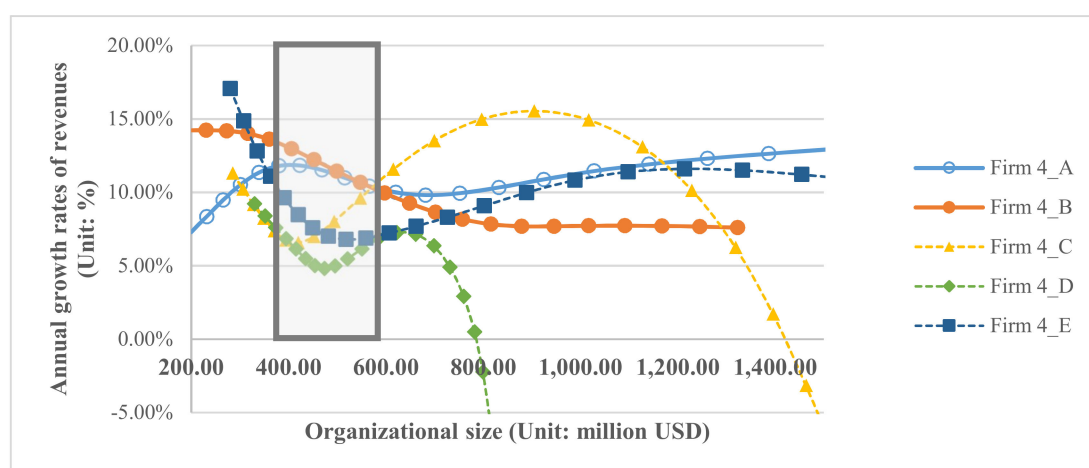


Figure 5. Organizational growing pains by company size: 500 million USD.

Firm age and size could help organizations become more efficient. Over time, firms discover what they are good at and learn how to do things better. Furthermore, they could specialize and find ways to standardize, coordinate, and speed up their production processes, as well as to reduce costs and improve quality. However, there is a higher possibility for older firms to create

a certain degree of resistance to change. In addition, an organization's age might make knowledge, abilities, and skills obsolete and induce organizational decay [72,73]. A possible reason is that success induces firms to codify their approaches and routines through organization and processes over time. This routinization of organizational behaviors seems increasingly to entangle firms in structural and process-related rigidities that are difficult to discard [30,71,74]. In other words, the organizational success that comes with increases in the organization's size and age could create a certain degree of resistance to change [75]. In such conditions, those firms have high possibilities to be reluctant to shift into new activities, and be unable to respond quickly to changing environmental conditions, creating lengthy delays between the time the organizations identify new opportunities, and the time they take action. This suggests that for those companies that pass through the fourth stage of growing pains, successful turnaround strategies can be implemented by revitalization efforts which cover a wide range of key organizational development issues (i.e., revitalizing business concepts, markets, products, operational systems, management systems, corporate culture, etc.) to change and revitalize their entire businesses [14].

2.3. Development of Conceptual Framework

In our view, Korean firms are found to have generally proceeded through four distinct stages of growing pains. As illustrated in Figure 6, critical areas of organizational development required for business organizations to shift from stage to stage of the organizational life-cycle include acquisition of resources/assets, development of new products, exploration of new markets, and development of operational and management systems. At each stage of the organizational life cycle, one or more of the key variables of organizational development are paid more attention until the business enterprise successfully deals with organizational growing pains, and makes the transition between growth stages driving sustained and profitable growth. Key variables of organizational development are strongly associated with different sets of internal and external environmental variables governing the organizations in each stage of growth. As shown in Figure 6, we propose the organizational growth model in terms of growing pains and key dimensions for business management strategies, on the basis of findings drawn from our statistical analysis as presented in Section 2.

Our growth model consists of four distinct stages (in terms of organizational growing pains), and every stage presents a new set of developmental challenges for organizations. Based on the previous studies' findings and frameworks, we consider six essential areas of organizational development as follows: products/services, markets, resources, operational systems, management systems, and corporate culture. Even though six tasks of organizational development must be performed together for firms to overcome growing pains and shift from stage to stage of the organizational life-cycle, we formalize that the degree of emphasis required in each developmental area may vary according to the stage of growth. The relative emphasis on those developmental areas during the growth stages is expressed with greyed-out elements as depicted in Figure 6. In addition, four stages of organizational growth are taken into consideration from birth to decline stage in order to account for stages of growing pains in accordance with previous literature. Several studies [5,14,15,21,22,26–28,42,76,77] suggest that business organizations follow predictable patterns and common stages. For example, Miller and Friesen [34] identify common stages of growth (birth, growth, maturity, revival, and decline, and find complementarities among the variables of environment, strategy, organizational structure, and decision-making modes within each stage. In addition, Hankes et al. [33] attempt to identify stages of growth based on cluster analysis, and show that each stage is a unique combination of organizational and strategic variables. However, those previous studies largely focus on static characteristics existing in different stages, which pay little attention to the transition process between growth stages. Our proposed growth model, therefore, aims to incorporate the processes by which organizations progress from one stage to another with the concept of organizational growing pains.

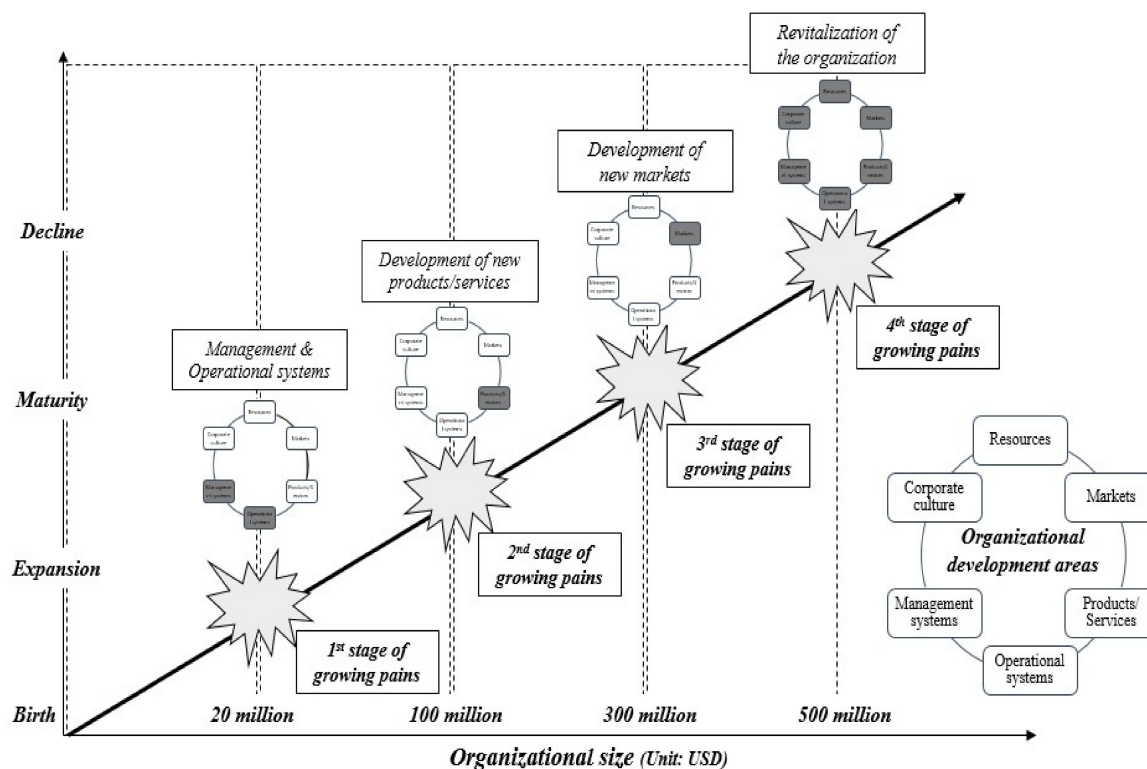


Figure 6. Our organizational growth model in terms of growing pains.

From the statistical analysis, the 1st stage of organizational growing pains is found to be largely experienced by technology-oriented startups when they reach approximately \$20 million in their sales revenue. In this stage, the key issues for organizational development are associated with the development of a formal management and operational system, as pre-existing internal systems (i.e., the production, delivery, and aftermarket support of the firm's offerings) often expose the limitations of ad hoc processes. During the start-up stage, entrepreneurial ventures are heavily dependent upon informal, even intuitive decision-making process. As the firms grow, however, this informal communication and decision-making processes become unwieldy. The rapid growth of the entrepreneurial ventures places considerable demands on the functional specialists and operational systems [63,65,66,78,79]. Therefore, the main challenges for those firms are to ensure that internal control and management systems are developed and coordinated systematically, in line with the rapid growth of organizational size as discussed by other studies [62–64,67,80,81]. As a result, during this stage firms tend to establish their competencies to effectively deliver and support their products or services. Relative emphasis is placed on the following tasks: systemization of management systems, and refinement of internal systems.

If business organizations successfully complete the key developmental tasks of the 1st stage of growing pains, they would experience the 2nd stage of growing pains when they reach approximately \$100 million in their sales revenue. The 2nd stage of organizational growing pains is found to be experienced by firms in high-tech industries (i.e., electrical, and machinery equipment industries). In addition, it is found that those firms that have undergone the 2nd stage of growing pains are found to have already achieved maturity stages with consolidated positions in their markets as mid-sized firms, unlike companies that experienced the first stage of growing pains. In this stage, Korean firms tend to experience the limitations of initial products or services, due to increased competition in the market, and the maturity stage of the product life cycle. After the consolidation stage of growth, firms are likely to face increased competition in the market and inevitably attempt to gain competitive advantages with the development of new products [68–71]. Facing the 2nd stage of organizational growing pains, firms may well have to develop new products or services to facilitate future growth. The emphasis

is placed to the development of new products/services for niche markets by securing relevant resources and assets for the 2nd stage of growing pains. As the electrical and machinery equipment industries are characterized by a high level of innovation and differentiation, short products/services life-cycle and high variety, firms experiencing the 2nd stage of growing pains turn their attention to the development of new products/services for niche markets with complementary assets.

By the time firms reach \$300 million in sales revenue, most firms in the wholesale and retail trade, and iron and steel industries are found to have experienced another type of organizational growing pain. We argue that the 3rd stage of organizational growing pains typically undergone by Korean firms appears when those reach approximately \$300 million in their organizational sizes. From the statistical analysis, we find that most companies that experienced the 3rd stage of growing pains had difficulties in exploring new markets for their existing products, entering new potential markets, and expanding their market shares. This can be understood by the industry-specific conditions that exist in wholesale and retail trade, and iron and steel industries in Korea as discussed in Section 2.2.3. Quantitative findings also suggest that those firms are found to have already achieved organizational maturity stages like firms which have undergone the second stage of growing pains. However, the different characteristics of the industries in which those firms exist suggest different approaches to deal with organizational growing pains. Accordingly, the emphasis should be turned to the definition of the firm's markets and potential niches for the 3rd stage of organizational growing pains. This process involves strategic market planning to identify potential customers and their needs, and laying the strategy for the firm's competition with others for its share of the intended market as noted by previous studies [14,15,82].

After firms successfully complete the key developmental tasks required for the 2nd and 3rd stages of growing pains, there are possibilities for them to encounter another type of organizational growing pains. From the statistical analysis, it is found that the 4th stage of growing pains is typically encountered by firms in capital-intensive industries (i.e., the chemicals and chemical product industry). This stage is typically shown by the time those firms reach approximately \$500 million in organizational size. From the HP filtering analysis, we confirm that those firms that experienced the 4th stage of growing pains are found to have proceeded to the decline stage. During this stage, the organizational development process takes place in a wide range of areas as follows: revitalizing the business concepts, refining products/services, re-conceptualizing markets, revitalizing operational and management systems [14,72,73]. Flamholtz and Randle [14] suggest that the basic problem that makes revitalization so difficult is that firms in this stage must focus on wide range of the organizational development areas. As noted by previous studies [30,71,74,75], however, even though firms may need to make major investments to revitalize the business organizations, they may encounter significant internal resistance [83]. Therefore, this process requires careful planning and management practices to ensure the alignment of strategic goals with the organizational development process.

Although Figure 6 shows the key variables to which the most attention is turned at each stage, it is important to remember that all these areas must be managed at the same time. Key findings drawn from the HP filtering analysis lay foundations for developing a conceptual framework on stages of growth, and different types of growing pains experienced by Korean firms as shown in Table 1. Table 1 summarizes the characteristics of organizations, the underlying causes of organizational growing pains, and the degree of emphasis required in each developmental area during each stage of growing pain. As mentioned above, they are drawn from the results of HP filtering analysis, and considerations for the industrial contexts of Korea, along with arguments from previous studies.

Table 1. Conceptual framework on the types of growing pains faced by Korean firms.

Stage of Growing Pains	1st Stage	2nd Stage	3rd Stage	4th Stage
Firm's characteristics	Technology-oriented ventures (e.g., energy, IT, and biotechnology)	Firms in high-tech industries (e.g., electrical, and machinery equipment industries)	Firms in mature industries (e.g., wholesale and retail trade, and iron and steel industries)	Firms in capital-intensive industries (e.g., chemicals and chemical products industry)
Growing pains (in terms of sales revenue)	20 million USD	100 million USD	300 million USD	500 million USD
Causes of growing pains	Ineffective internal control system	<ul style="list-style-type: none"> - Increased competition in the market - Maturity stage of the product life-cycle 		Structural rigidities and organizational routines
Key developmental areas	<ul style="list-style-type: none"> - Systemization of management systems - Organizational innovation 	Development of new products for niche markets by securing resources/assets	Exploration of new markets for expanding business opportunities	Revitalization process on a wide range of organizational development areas

3. Qualitative Methods and Findings

As discussed above, we have identified stages of growing pains faced by Korean firms from 1990s to 2010s in terms of their organizational sizes as follows: 20, 100, 300, and 500 million USD. Based on the findings drawn from the quantitative analysis, we have proposed a firm's growth model focusing on the transition between growth stages and organizational growing pains. In addition, we have constructed a conceptual framework on stages of growth, different types of growing pains, and key developmental areas for firms to overcome each stage of growing pains, focusing on Korean firms. In the following subsections, we will examine case examples to highlight the importance of a firm's strategies in dealing with organizational problems appropriately to overcome growing pains. Our proposed conceptual framework drawn from the quantitative findings as presented in Figure 6 and Table 1 can be utilized as a theoretical foundation for the case studies.

Accordingly, the main purposes of the qualitative studies presented below is to complement findings drawn from quantitative analysis, to validate our proposed conceptual framework, and to enhance the reliability and accountability of our framework. In addition, through the case studies, we will explore underlying causes of the growing pains encountered by Korean firms from the 1990s to 2010s, focusing on external (i.e., shifts in demand, in technology or competitive circumstances) and internal factors (i.e., internal infrastructure of the business organizations), and highlight the importance of business management strategies to overcome growing pains. From the case studies, we stress the importance of strategic management to overcome growing pains during the growth paths of firms. This approach is in line with other studies' approaches. For example, contingency theory is characterized by a specific approach to the strategic fit of organizations. This approach provides insights into how organizations adapt to changing situations by modifying their internal resources and strategic choices to fit unforeseen events [84–86]. On the one hand, institutional theory proposes that firms in different contexts (i.e., operating in different institutional conditions) react differently to similar challenges [87,88]. This perspective highlights the interactions between firms' strategic decisions and institutional factors (e.g., regulatory conditions, interventions of the governments), which provide a theoretical foundation for linking the adaptation of firms to the macro institutional and competitive environments. On the other hand, selection studies have examined how contextual factors relate to specific aspects of the internal management systems of organizations [89].

To be specific, we will examine the growth paths of Firm 1_A (in Figure 2), Firm 2_A (in Figure 3), Firm 3_A, 3_B (in Figure 4), Firms 4_A, and 4_B (in Figure 5) (Because of the confidential information of

the firms, we do not mention the firms' names directly presented in Section 3) in order to offer extensive explanations for the significance of a firm's strategies to deal with each stage of growing pains. A wide range of documents and reference materials are used for the case studies, including annual company reports, interviews with managers or founders, and companies' web pages to extract additional information on the firms' histories and the growth paths they took.

3.1. Case Study: Firms Overcoming Growing Pains with 20 Million USD Revenue

The development of management systems could be one of the most important and pressing tasks for organizations when the growth rates of organizational sizes outstrip the rates at which the enterprises' management systems are well established. If the required infrastructure and related internal control systems are not in place, the organization will not operate well, resulting in various organizational problems. Firm 1_A's course of growth is a good example to explain the importance of the infrastructure of management systems as a sound platform for future growth that allows a company to operate efficiently on a day-to-day basis.

Firm 1_A was established in 1997 as a manufacturer of digital electric meters. It experienced a transition from a high-growth path to a low-growth path by the time it reached approximately 20 million USD of revenues during 2008 to 2011. This was a time of slowdown in overall economic growth caused by the global financial crisis, thereby depressing the housing construction sector. Under these situations, the projects and businesses under the Firm 1_A could not speed up. At the same time, its growing pains were brought about, at least in part, by underdeveloped operational and internal control systems required for the organization's continued growth.

One of key factors to help the Firm 1_A overcome its growing pains was the development of operational and management systems. While Firm 1_A had already developed core competencies in technological capabilities as an important driver of product development outcomes with a large number of patents, entrepreneurs were unable to cope with the managerial problems that arose as the organization grew. (During the mid-2000s, the number of defective products and product breakdowns increased as the production volume of Firm 1_A expanded.) In such situations, the infrastructure of the management system that let the company operate efficiently and effectively was essential to ensure sustained growth. However, during the rapid expansion in its organizational size during the early 2000s, Firm 1_A was not interested in developing formalized operational systems (e.g., quality-management systems), but placed emphasis on securing marketing channels and the acquisition of resources required to diversify product lines.

Despite rapid expansion in sales revenues, it underdeveloped its quality-control infrastructure to consistently meet customer requirements and enhance their satisfaction. In this situation, Firm 1_A appointed a general director of quality management dedicated to enterprise-wide quality management tasks in 2009. It also introduced a total quality-management system in 2009 to improve its ability to deliver high-quality products and services to customers. Furthermore, Firm 1_A has made the transition from entrepreneurship to professionally managed organization. By hiring professional managers during the late 2000s, it began to develop the formalized management systems required to facilitate its future growth.

Furthermore, during 2008 to 2011 Firm 1_A faced a rise in production costs caused by the skyrocketing currency exchange rate. It sourced intermediate parts and components from China's original equipment manufacturers (OEMs), and assembled final manufactured goods in domestic manufacturing facilities. (At that time, the head office located in Korea carried out high value-added functions, such as research, design, and marketing.) Under this functional distribution, the global financial crisis caused Firm 1_A to face rising material costs and production costs. Accordingly, it underwent a stage of stagnation with fluctuations in revenues during the late 2000s. A foreign exchange risk-management system was an essential component for Firm 1_A which imports the majority of intermediate goods from abroad, so as to flexibly deal with the economic crisis. However, Firm 1_A had not developed such a system at that time.

As Firm 1_A experienced significant problems when it reached approximately 20 million USD of revenues in the late 2000s, it started to make improvements in business functions and corporate governance. To cope with future conditions of uncertainty, it suspended subcontracts with China's OEMs, and started production of intermediate parts and components domestically in 2009. As a result of these efforts, it now supplies intermediate goods from its own manufacturing facilities. It considered that managing exchange rate risk exposure was also important for reducing the firm's vulnerabilities to major exchange rate movements. As a result, it assigned a chief finance officer for tasks, including financing, accounting, and foreign exchange risk management, in order to enhance its financial system in 2009. Following those strategic choices including the implementation of new organizational methods, and the development and establishment of operational management systems, it could overcome growing pains successfully in 2012. The example of the Firm 1_A's growth path highlights the importance of organizational innovations in the management system as a sound platform for overcoming the first stage of growing pains.

3.2. Case Study: Firms Overcoming Growing Pains with 100 Million USD Revenue

The example of Firm 2_A's transition process from the state of growing pains toward a rapid growth phase sheds light on growth strategies to create new opportunities for future growth after the consolidation stage of organizations. Firm 2_A was established in 1956 as a manufacturer of electrical equipment, including high-energy storage capacitors, and electromagnetic filters. Firm 2_A experienced its growing pains by the time it reached approximately 100 million USD of sales revenues during the mid-2000s. Its growing pains are attributable to various factors, such as sluggish demand for electrical equipment products from downstream industries due to the depressed IT industry, and increased competition from other countries' manufacturers, resulting in lower profit margins and a state of stagnation.

A critical challenge posed to Firm 2_A was the threat of latecomers with cost advantages, especially those with much lower labor costs. During the early 2000s, latecomers made large-scale investments in new production facilities to gain comparative advantages in production costs over their competitors. Another problem faced by Firm 2_A during the mid-2000s were the significant breakthroughs made by Japanese firms in the development of new and more efficient materials and methods for cost-efficient manufacturing processes. While latecomers including Chinese manufacturers expanded their market shares in the general-purpose electric equipment markets with huge investments for production facilities, Japanese companies attempted to gain competitive advantages in superior-quality and highly customized products. At that time, the core business of Firm 2_A (i.e., general-purpose electric equipment) reached limits in terms of available market share. In such situations, increased competition driven by Chinese and Japanese manufacturers decreased Firm 2_A's profit margins and eroded its market share over time. As a result, Firm 2_A experienced growing pains when it reached an organizational size of 100 million USD in sales revenues.

Nevertheless, it successfully dealt with growing pains through the development and introduction of new products for new markets with enhanced research and development (R&D) activities. In particular, Firm 2_A felt the importance of the development of highly customized products to fulfil specific customer requirements as a niche market strategy. (With the advent of high value-added IT devices during that period, an increased demand for higher capacity, superior quality, and highly customized capacitors is expected.) Accordingly, it attempted to overcome its growing pains by diversifying its product lines from general-purpose electrical components to highly customized equipment and products. In order to develop core capabilities to diversify product lines, Firm 2_A attempted to maintain its R&D intensity (measured by the ratio of R&D expenditure to sales revenues) at about 1.5%. Having maintained its R&D spending despite its growing pains during the mid-2000s, Firm 2_A could establish technological capabilities specializing in highly customized products.

In addition, Firm 2_A reorganized its in-house R&D structure from a single unit into three departments in 2006—new product development, research planning, and new project development units—to enhance the efficiency of R&D activities. Furthermore, it sold several businesses, and reorganized business units aiming at a transition toward high value-added products. Moreover, it sought to strengthen technological exchanges and transfers through the formation of a consortium with government-funded research institutes and other companies, thereby establishing organizational infrastructure associated with the development and mass production of high value-added products. As a result of these efforts, it succeeded in developing core fundamental technologies applied to high-capacity, high-reliability capacitors and component modules. The number of Firm 2_A's patent applications that are issued and granted has also shown a rapid increase from 2004. In 2004, the total number of patents that were issued and granted was only 3, but it increased to 16 in 2011, 30 in 2012, and 21 in 2013.

Likewise, Firm 2_A made concentrated efforts to gain competitive advantages with regard to product differentiation through R&D activities. It attempted to maximize the value creation from high value-added products based on its technological capabilities through reorganizing business units to integrate R&D with other relevant complementary assets. As a result, Firm 2_A overcame its growing pains at the stage of 100 million USD in sales revenues, and made a successful transition to a high growth phase in the late 2000s.

3.3. Case Study: Firms Overcoming Growing Pains with 300 Million USD Revenue

Founded in 1945, Firm 3_A provides special wire products, including wire rope and pre-stressed concrete steel wire, and now is positioned as a leading manufacturer in Korea. Firm 3_A is found to have undergone growing pains during the mid-2000s. With the Korean financial crisis during the period between 1997 and 1998, market conditions in the construction and car-making industries had continued to worsen until the early 2000s, resulting in a critical crisis in the iron and steel industry. In addition, other factors, such as decline in global demand for steel products and increased global competition from steel makers in South-East Asia with low manufacturing costs, deepened the iron and steel industry crisis until the early 2000s. Under these severe conditions, Firm 3_A's market share decreased, and it experienced growing pains when it reached an organizational size of 300 million USD.

One of the key strategies for Firm 3_A to overcome its growing pains was customer-oriented marketing strategies focused on overseas markets, in parallel with consistent R&D investments in developing new products. Facing the financial crisis in Korea, Firm 3_A made active investments in R&D activities and built additional experimental and research centers in 1998 so as to enhance collaboration with various steelmakers and public research institutes (i.e., universities, and government-funded research institutes). Based on this form of research networking and collaboration, it sought to increase shared learning, new research opportunities, and technology transfers, as well as to promote flexibility to adapt to a wide spectrum of challenges in product differentiation. Along with these efforts focusing on the development of new products for the existing market, Firm 3_A actively extended its manufacturing sites abroad to gain access to new markets, and search for opportunities to operate businesses in new markets.

Since the late 1990s, developing countries, especially those in the South-East Asian region, have been the fastest-growing market in the world for steel products due to their rapid rates of industrialization. In response to the rapid growth of new potential markets, Firm 3_A actively set up manufacturing facilities and service centers in those areas from the early 2000s. By 2014, Firm 3_A had established four factories in Malaysia, six in China, three in the United States, two in Vietnam, two in Indonesia, and one in Hungary. Based on these production facilities abroad, it focused on customer-oriented services, including maintenance (e.g., product updates and technical support), repairs, and other types of services (e.g., product customization and training). Firm 3_A highlighted the increasing importance of customer-oriented services as the company's strategic development strategy. As a result, Firm 3_A could customize its product lines to fit the context of customers in new markets and retain its differentiated brand image in the global market. Following these strategic

choices, Firm 3_A could overcome its growing pains, and successfully make the transition toward the next stage of growth, showing a rebound in growth rates of sales revenues after the mid-2000s.

Firm 3_B's course of growth is another good example to explain the importance of the exploration process for new markets to overcome organizational problems. Firm 3_B was established in 1968 as a specialized manufacturer of knitting garments. From HP filtering analysis, it is found that Firm 3_B experienced a transition from a high-growth path to a low-growth path by the time it had reached approximately 300 million USD of revenues during the mid-2000s. The Korean financial crisis during the period between 1997 and 1998 depressed domestic market conditions, resulting in decreased clothing consumption. This trend continued until the mid-2000s, and Firm 3_B faced its growing pains during that period.

Under such conditions, Firm 3_B attempted to explore new markets for existing products abroad, based on its established overseas subsidiaries and interconnected subcontracting factories. From the early stages of the organization, it did not build its production facilities in Korea, but manufactured the entire range of its products by outsourcing from overseas subsidiaries and subcontracting factories located in South America and South-East Asia to gain cost advantages over competitors. With already well-established global production networks, Firm 3_B implemented aggressive marketing strategies targeting the overseas market rather than the domestic market. As a company in the wholesale and retail trade industry, which is sensitive to changing consumption trends, Firm 3_B attempted to regain sustainable competitive advantage by expanding its market share in new markets abroad. Well-established production facilities distributed across the world played an important role as a bridgehead for Firm 3_B to enter the overseas market. As a result, it could overcome growing pains and successfully make the transition toward the next stage of growth after the mid-2000s.

3.4. Case Study: Firms Overcoming Growing Pains with 500 Million USD Revenue

Firm 4_A was founded in 1969 as a manufacturer of petrochemical products. Until the late 1990s, it grew rapidly through the expansion of businesses with vertical integration and portfolio diversification. It steadily continued to invest in production facilities during the 1990s, and increased production outputs from linear alkylbenzene (LAB) and normal paraffin (NP) plants. As a result, it could flexibly respond to increasing world demand for industrial petrochemical products at that time, showing high growth of sales revenues. However, it had undergone the stage of stagnation since the early of 2000s, and experienced growing pains when it reached approximately 500 million USD of sales revenues during the mid of 2000s. To overcome its growing pains, it had tried to deal with a wide range of issues involved with its stage of organizational decline and revitalization.

One of the most important factors in dealing with growing pains was to re-conceptualize its target market and update its product lines. Since the late of 1990s, there had been an increased competition in the markets of LAB and NP, due to new entrants from China and Middle Eastern countries. In such a situation, Firm 4_A had successfully developed tertiary dodecyl mercaptan (TDM) in 1997, and it was the third company in the world to succeed in developing the TDM. The TDM production process by nature recycles waste generated in the LAB production process, and uses it as raw material. In this way, Firm 4_A had tried to expand its businesses by starting manufacturing a new product (TDM) related to its existing business activities. Under this form of related diversification, Firm 4_A had made easier the consumption of its products by producing complementary goods, and enhanced the efficiencies in the production process. Production of TDM became a new revenue-generating source for Firm 4_A, with the increased demand coming from the synthetic resin and synthetic rubber markets. As a result, Firm 4_A overcame its growing pains, and made a successful transition towards a high growth phase in the late of 2000s.

Firm 4_B's course of growth is contrasted with that of Firm 4_A. Founded in 1964, Firm 4_B manufactures intermediate raw materials and basic chemical products used for various industrial fields. Firm 4_B had produced urea and ammonia using naphtha as a raw material, but it lagged

behind Middle Eastern companies which produced urea and ammonia with natural gas, and Chinese companies which produced them using coal with cost-competitiveness. As a result, Firm 4_B had been in a deficit since 2003, and suspended its production of urea and ammonia from 2011. Instead, it established a joint venture company with a Japanese ceramic manufacturer in 2011 to enter the secondary battery material market. It also established another joint venture company with a solar panel manufacturer in the U.S. to gain access to new opportunities in the solar polysilicon market. However, those businesses went into liquidation in 2015. As a result, it is still trapped in its growing pains with challenges of revitalization. Firm 4_B tried to overcome growing pains through a horizontal expansion, seeking to diversify its product lines, and gain access to new markets with high-growth potential.

However, it is pointed out that Firm 4_B had implemented excessive diversification strategies with unclear long-term strategic goals for revitalization, resulting in increased bureaucratic costs. Through the establishment of joint ventures, Firm 4_B had attempted to revise its strategic goal of producing high value-added chemical products, and to forcibly advance into new markets, following other global companies. The revitalization process with the lack of a long-term strategic direction caused significant challenges for Firm 4_B in ensuring organizational developments aligned with its future goals. Lacking alignment between organizational systems and strategic goals, the new businesses of Firm 4_B created additional bureaucratic costs, and hindered the revitalization process of the company. In reality, it can be noted that there were frequent conflicts between managers and engineers from foreign companies over sharing ideas, knowledge, and corporate cultures, due to differences in organizational cultures.

It is important for companies in the stage of decline which pursue the process of revitalization to develop and revise their organizational infrastructure in order to support new businesses. In this revitalization process, several different but related issues must be addressed. In other words, the organization needs to ensure whether it has appropriate resources, operational systems, management systems, and corporate governance, aligned with clear long-term strategic goals to support the revitalization process. Firm 4_A had a deeper understanding of how to fit and coordinate diversification activities with an existing organizational infrastructure. On the other hand, Firm 4_B failed to integrate the new businesses into its existing portfolio of business and revise its organizational infrastructure aligned with its future goals. Those examples shed light on the importance of the alignment between organizational infrastructure development and strategic goals in order to exit the decline stage and seek a revitalization process.

4. Conclusions

Firms go through distinct stages of growth, and face different sets of internal and external environmental variables as they move from one stage to another [90]. The sustainable growth of firms involves successful transitions between growth stages through managing organizational growing pains and maintaining sustainable competitive positions [91]. Different sets of variables governing the organizations in each stage cause growth challenges, and tend to hinder a successful transition process between growth stages. In this study, we define organizational growing pains as problems that occur as a result of inadequate organizational development in relation to business size and external environments at a given stage of growth. The sustainable growth of firms can be fraught with those growing pains. Therefore, it is important for managers and founders of companies to understand the different aspects of the transitions over the life-cycle of business organizations in order to secure the sustainable growth of firms. In this context, the objectives of this paper are to propose a conceptual framework to account for a business organization's life-cycle in terms of organizational growing pains and key developmental areas by synthesizing qualitative and quantitative findings. To achieve this objective, we have formalized the proposed conceptual framework through analyzing key findings drawn from statistical analyses, and collecting evidence from case studies to enhance the accountability of our proposed framework. Through the case studies,

we have collected observations of organizational behavior to generalize about the determinants of organizational growing pains and key developmental areas for organizations in the various stages of organizational growth.

Based on the case studies, we examine case examples to highlight the importance of a firm's strategies in dealing with organizational problems appropriately in order to overcome growing pains. Our proposed conceptual framework drawn from the quantitative findings lays down theoretical foundations for case studies. Our findings on the stages of growing pains and key organizational development areas for Korean firms from the 1990s to 2010s can be summarized as follows: (1) Growth stage with 1st stage of growing pains (20 million USD in organizational size): systemization of management system; (2) Maturity stage with 2nd stage of growing pains (100 million USD): development of new products with enhanced R&D capabilities and complementary assets; (3) Maturity stage with 3rd stage of growing pains (300 million USD): exploration of new markets for expanding business opportunities; and (4) Decline stage with 4th stage of growing pains (500 million USD): revitalization process on a wide range of organizational development areas. The life-cycle literature suggests that organizations evolve in a consistent and predictable manner, suggesting that organizational structures and strategies evolve as firms move through their life-cycles and growth stages. From this perspective, the managers of companies must learn how to manage growth and deal with their growing pains for the inevitable transitions from one to another stage of growth. It is also required for managers to understand the significance of the concept of organizational life-cycle and explore the underlying causes of growing pains that hinder a successful transition toward the next phase of growth, and key organizational development areas to overcome organizational growing pains [92].

Accordingly, our findings suggest that there are different types of transition during the growth trajectories of firms that must be made at different stages of growth in order for business organizations to continue to flourish and grow successfully. If those types of transitions between growth stages are not made effectively, firms will experience growing pains, which have a significant impact on organizational effectiveness, efficiency, and success [14]. Different aspects of the transitions and growing pains that must be made over the entire life-cycles of firms help us identify the underlying factors that cause transition failures between growth stages [90,93]. Understanding the underlying determinants of growing pains and key developmental areas required for the successful transitions promote long-term success and ultimately result in sustainable corporate growth. Based on these understandings, leaders and managers of business organizations should proactively know about how to design organizations with appropriate business strategies in order to adapt to different sets of internal and external changes in accordance with growth stages. Their capabilities associated with management and organizational development with timely decision-making in different situations can contribute to the progress of organizations, and create value and competitive advantage over competitors.

In this context, this study has academic merit in presenting a conceptual framework for understanding the growth patterns and stages of business organizations in terms of organizational growing pains. It presents a holistic framework beyond a synthesis of different models such as, organizational development models and organizational life-cycle models. Accordingly, we expect our proposed conceptual framework and organizational growth model to provide comprehensive insights for examining the linkage between organizational growing pains and formulation of business management strategies at different stages (or, positions) of business organizations by considering the governing internal and external conditions. The limitation of this study lies in the fact that the analysis is limited to the contextual conditions of Korea. As noted by institutional theory, context-specific and institutional conditions can shape different strategic choices of firms. Therefore, further research may require the enhancement of generalizability beyond the context of this study.

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Appendix Descriptive Statistics on Firm-Level Data Used for the Analysis

Along with the information on the number of companies used for the statistical analysis (Table A1), descriptive statistics of sales volume by industry 2 (average annual sales revenue by industry) in 1990, 2000, 2010, and 2013 are listed in Table A2. The average annual sales revenues of firms in the electricity, gas, steam, water supply and construction industry show the largest level with 32.13 million USD in 2013, followed by the electronic component industry (22.07 million USD in 2013). The values of the pharmaceuticals and medicinal chemicals, and textile industries are found to be the lowest (1.64 million USD in 2013), and the second lowest (2.32 million USD in 2013) among all industries except for the other services industry.

Table A1. Number of companies by industry used for the statistical analysis.

Industry	Number of Companies
Manufacturing	490
Food products and beverages	41
Textiles, sewn wearing apparel, pulp, paper and paper products	60
Chemical products except pharmaceuticals, medicinal chemicals	68
Pharmaceuticals, medicinal chemicals and botanical products	43
Transport equipment, metal, and non-metallic mineral products	188
Electronic components, optical instruments and electrical equipment	90
Non-Manufacturing	255
Electricity, gas, steam, water supply, and construction	48
Wholesale, retail trade, information and communications	99
Other services	108

Table A2. Average sales revenue by industry in 1990, 2000, 2010, and 2013.

Industry	Average Sales Revenue (Million USD)			
	1990	2000	2010	2013
Manufacturing				
Food products and beverages	1.43	3.09	4.92	6.33
Textile, sewn wearing apparel, pulp, paper and paper products	0.89	1.69	2.16	2.32
Chemical products except pharmaceuticals, medicinal chemicals	1.39	4.59	11.17	13.99
Pharmaceuticals, medicinal chemicals and botanical products	0.37	0.62	1.60	1.64
Transport equipment, metal, and non-metallic mineral products	2.37	4.72	12.25	13.34
Electronic components, optical instruments and electrical equipment	2.29	6.70	16.38	22.07
Non-Manufacturing				
Electricity, gas, steam, water supply, and construction	4.00	10.96	25.20	32.13
Wholesale, retail trade, information and communications	5.20	17.22	15.34	15.19
Other services	2.61	4.82	3.14	2.94

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