The Rise and Pitfalls of K-Entrepreneurship in balancing Creativity and Productivity: SMEs in Korea

Abstract

This paper examines the longitudinal performance of SMEs in terms of their R&D spending. In tracing eight selective SME suppliers for Samsung Electronics, we report how these firms move over time among the combinations of high/low creativity and high/low productivity. The results of our analysis provide strategic insights for SMEs.

If the initial strategy of firms is the pursuit of innovation, the continuous reinvestment of profits obtained from every round of innovation would lead to innovation-specialization. Because of this, firms could no longer adapt quickly to new changes because of increased rigidity. To avoid this innovation trap, the firm should have some buffers derived from previous profits (Govindarajan & Trimble, 2010; Greve, 2003; Nohria & Gulati, 1996). Resources invested in innovation should thereby be transformed into concrete products (Teece, 1986). That having been said, firms should first invest in process innovation through R&D, then subsequently invest in product innovation in the form of new products and new channels of exportations once it acquires enough resources.

Creativity through Exploration

The research at hand defines creativity as an explorative activity undertaken by an organization to overcome rigidity, active inertia, and competency dependency, achieved though utilizing dynamic capability. Creativity has been previously defined as the production of novel

and useful ideas in any domain, which is, in turn, the starting point of innovation (Amabile, Conti, Coon, Lazenby, & Herron, 1996). Entrepreneurial creativity, on the other hand, is the implementation of novel, useful ideas to establish a new business or new program to deliver products or services. This study uses R&D expenditure as the unit of measure for creativity of a firm. It is highly related to creativity, defined by UNESCO Institute for Statistics (2014) as, a creative work undertaken systemically to accumulate knowledge, and use it for new applications. R&D covers basic research, applied research, and experimental development.

Opportunity through Niche Creation

Opportunity is the result of the creation of an ecological niche, by establishing niche breadth and depth through market and product development, respectively. According to Dimmick (1997) a population's or industry's niche is its position on the environmental resource dimensions or its resource utilization pattern. He defined a population as a set of organizations that are more like each other than they are like members of other populations.

Creating niches through opportunities stands for creating new markets, serving neglected markets and opening new business. New niches can offer new products or disruptive technologies, technologies that render the old one obsolete (Christensen, 2002). The threat of disruptive technologies has already caused the failure of huge firms like Kodak and Xerox (Charan & Useem, 2002). Firms better equip themselves with the right dynamic capabilities for competitive survival, with new knowledge to disrupt the industry or drown out into a new competition (Eisenhardt & Martin, 2000). The threat of disruptive technologies on top of the fierce competition in the marketplace adds to the pressure of managers to make the right decisions to assure corporate longevity and business healthiness.

Productivity through Exploitation

Productivity is an exploitative activity undertaken by an organization to maintain the cost effectiveness of its market niche, achieved through utilizing operational capabilities. Previous work has defined productivity as how effectively an ecosystem converts inputs such as raw materials into living organisms (Iansiti & Richards, 2006). Business ecosystem productivity is defined as the ability of the network to consistently transform technology and other raw materials of innovation into cost efficiencies and new products. Alan Greenspan noted on Enron's collapse that a firm's value-added is fragile if it is abstract (e.g. reputation) instead of distinct physical assets (Charan & Useem, 2002). Therefore, firms should not be caught in a success trap by continually coordinating resources to exhaust possibilities in improving its current business and creating "isolating mechanisms" or barriers to imitation through managerial capabilities, intellectual property rights and information asymmetries (Hooley, Greenley, Fahy, & Cadogan, 2001; Winter, 2003).

Methodology

We collected longitudinal data from eight selective SMEs that are electronic suppliers of a large Korean company for 2006 to 2011. We plotted Sales Revenue per Employee on the x-axis and R&D intensity on the y-axis.

Results Company 1 The first sample company was able to experience both high productivity and high creativity in the past, but is struggling in more recent years.

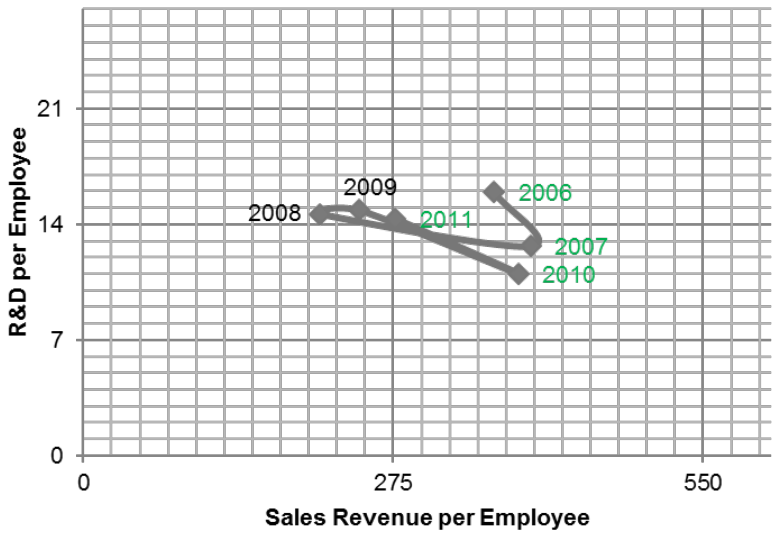

Fig. 2: A SME Supplier move between High Creativity/High Productivity and High Creativity/Low Productivity

This company has a policy of having R&D investment at 3-5% of sales revenue. When necessary in the business strategy, they could increase it up to 7-10% of sales. This is to maintain the sustainability of their major business product portfolio and to avoid risks from unreasonably aggressive investment. As a strategy, this companies gives priority on developing new products considering the synergy with current major products. They focus on the domestic market, but they also try to exploit the overseas market. This company makes an effort to increase productivity and to acquire cost competitiveness through stabilizing the production process and standardization of 4M1E (man, machine, material, method and environment) elements in the plant. R&D investment characterized fixed costs in 2006 and 2007, but sales revenue mostly depend on the market situation. During this time, the company also established US operations, and experienced and increase in investment and employees which resulted in the decrease in Sales Revenue per employee. Decreases in 2008 and 2009 were brought about by the global

financial crisis. Despite this, the company maintained their manpower and investment in R&D. By 2010 and 2011, they recruited many engineers as an investment for the future of the company.

Results Company 2 The next company, on the other hand, was able to maintain both creativity and productivity over the six-year period.

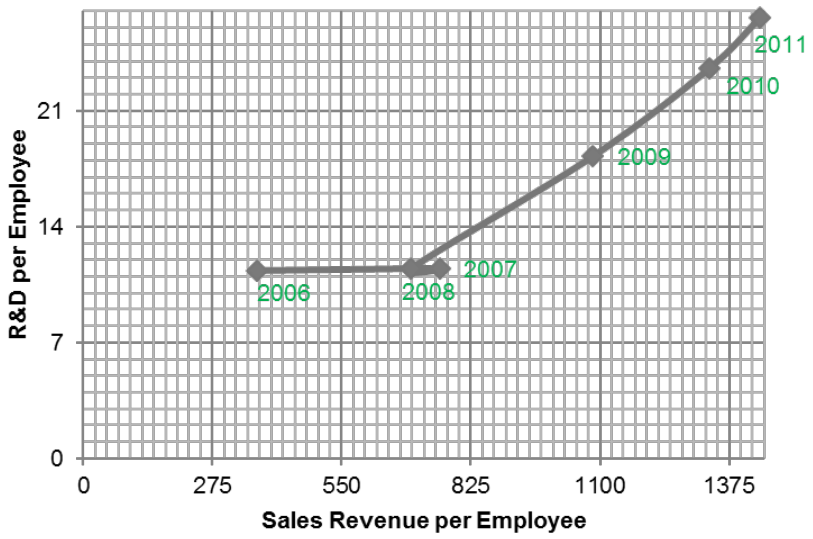

Fig. 3: A SME Supplier move from High Creativity/Low Productivity to High Creativity/High Productivity

The company has an R&D investment policy based on the expected sales revenue of Samsung and other customers. In 2013, R&D investment was 2.05%. Based on the result of market research, the company conducts new market and new product development at their Cheonan and Bundang R&D centers. They enhance productivity through the improvement of special tooling, innovation of raw material, and automation from the very beginning stage of new product development. Revenue growth has been driven by cost competitiveness improvement as well as the increase of sales revenue from customers. Increases in sales revenue has led to the higher R&D investment, technology innovation, and hiring of competent employees. This in turn

resulted to increased sales revenue. The company also benefited from the expansion of the mobile market. This was able to partly offset the potential declines of profitability brought about by additional investments in R&D.

Results Company 3 This company has been stuck in R&D Paradox for a period of six years.

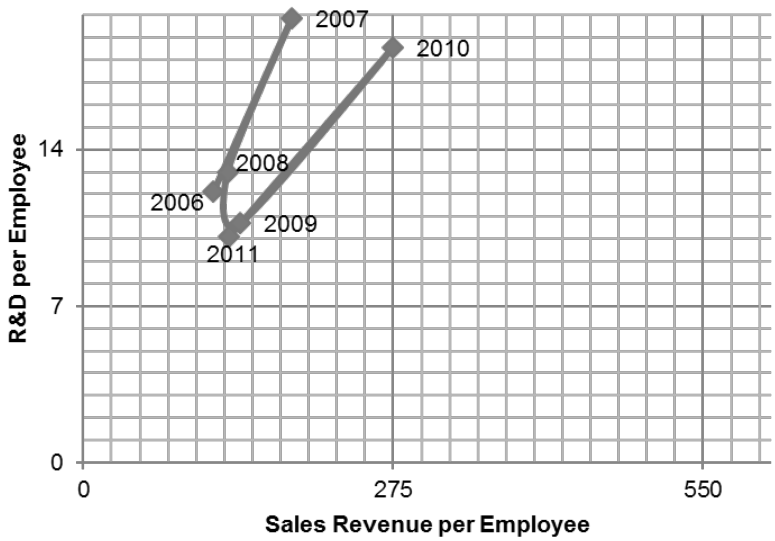

Fig. 4: A SME Supplier move within High Creativity but Low Productivity

This company follows an R&D investment policy which is no more than 10% of sales revenue. They invest in R&D in line with the implementation of their approved R&D project proposals. The company does not have a set policy in relation to new market and new product development. Instead of this, they conduct new product and new market development by means of reviews done in advance based on their R&D procedures. The company follows guidelines regarding productivity and cost effectiveness in the form of procurement management procedures. Aside from this, they have a parts suppliers' collaboration committee, and make use of sourcing diversification. The company has a lot of different products which are mostly done in small lots (non-volume). This is the reason why R&D investment increased despite the small

production size. Because of the nature and diversity of the products, the company's sales revenue does not increase in proportion to its R&D investment.

Results Company 4 On the other hand, the following company has been stuck in the paradox, but has slowly moved towards productivity by 2011.

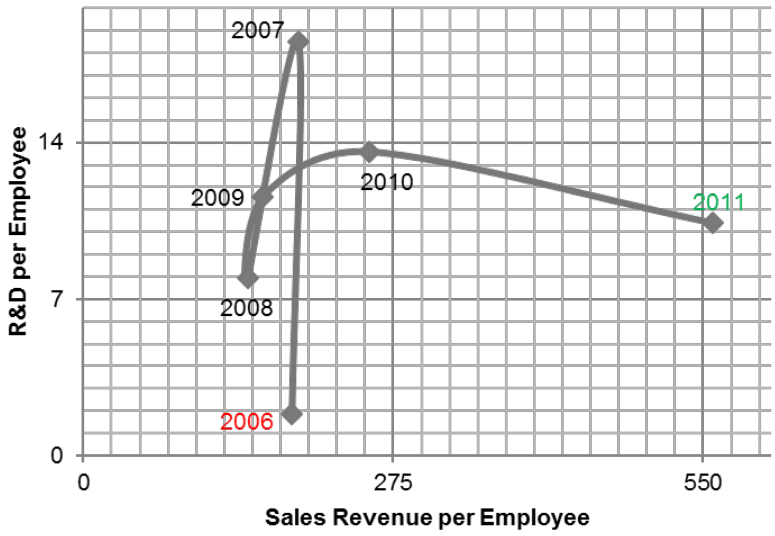

Fig. 5: A SME Supplier move from Low Creativity/Low Productivity to High Creativity/High Productivity

The company invests in R&D based on their own R&D process. For the past few years, they established business plans for subsequent periods, including the R&D project and began R&D activities based on this. We are also conducting economic feasibility study for R&D investment before implementation considering the performance of the past R&D project.

They follow a strategy regarding market creation or expansion though the development of advanced technology, as well as the development of new products. These depend on the technology development roadmap from the upstream industry (customers). Their technology development objective is to be the first to acquire market by launching products that customers

want at the right time. The company controls every cost element tightly based on the budget from the very beginning stage of new product development. In particular, from the new product planning stage they give authority and responsibility to the program manager to control the cost by the new product development stage. The R&D investment could increase depending on the requirement from the customers to innovate technology. However, this R&D investment could not directly result in sales revenue increase from the short term perspective.

Results Company 5 This company has been continuously stuck in the Vicious Cycle.

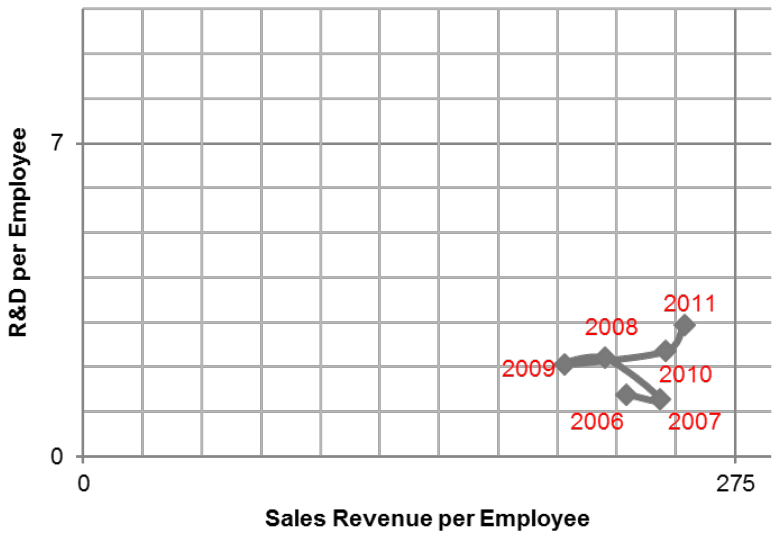

Fig. 6: A SME Supplier moving within Low Creativity/Low Productivity

The company does not have any policies or guidelines for R&D investment. In general, they invest 2 to 3% of sales revenue for R&D. In relation to market creation and expansion, the company has established a 5-year new product development roadmap. This reflects the changes the market experiences and as well as changes in customer needs. These changes are incorporated into the roadmap continuously. The company follows guidelines regarding productivity and cost effectiveness by making use of cost index and productivity as a key

management items. There has been a decrease in sales in 2008 brought about by the global financial crisis, R&D investment has thereby been decreased to cope with the financial losses. Mostly the performance indicators have gotten worse from 2009. From 2010 however, the demand increase for product resulting from economic recovery lead to increases in facility and R&D investment, further acquisition of new technology, and new business investment. The company also reinforced technology PR activities by visiting overseas equipment providers as a form of sales marketing. They have also tried to localize the critical paths and to acquire core technology through in-house R&D.

Results Company 6 This company started out in the Vicious Cycle, moved to R&D Paradox, and eventually got to the Virtuous Cycle.

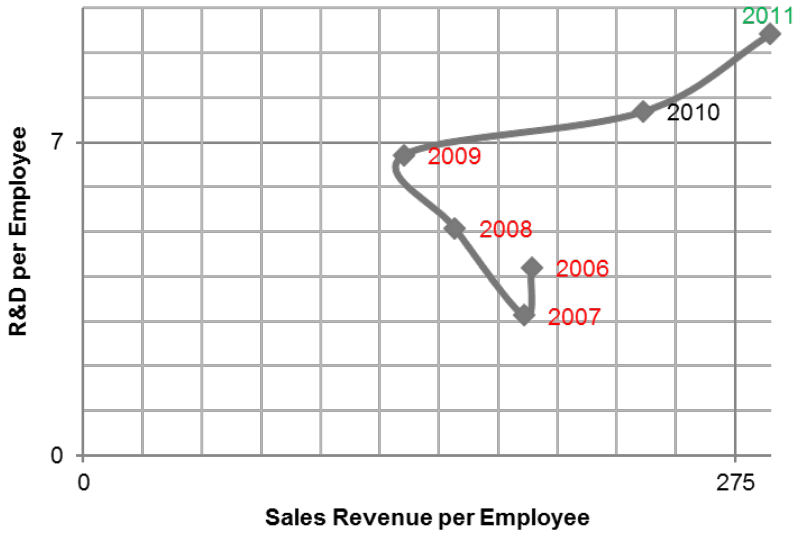

Fig. 7: A SME Supplier Moving from Low Creativity/Productivity to High Creativity/Low Creativity to High Creativity/High Productivity

The company follows an investment policy regarding R&D. R&D investment is set as 5% of sales revenue. The company confirmed that they have a strategy regarding market creation or

expansion, but they chose not to disclose it. Similarly, the company follows guidelines regarding productivity and cost effectiveness, which they chose not to elaborate further on. In May 2008, the company established a technology center so that they could conduct systematic R&D activities and new product development as well. They also conducted active R&D activities for the process improvement of QUARTZ which is an existing product. As a result, they were able to produce more complex and sophisticated products. The company also pursues product enhancement through the reduction of manufacturing hours by changing the manufacturing method. To meet customer satisfaction through their products, the company reduced the defect rates and provided on-time delivery. These activities helped the company increase sales revenue.

Results Company 7 This company has remained in Productivity Dependency for the past few years.

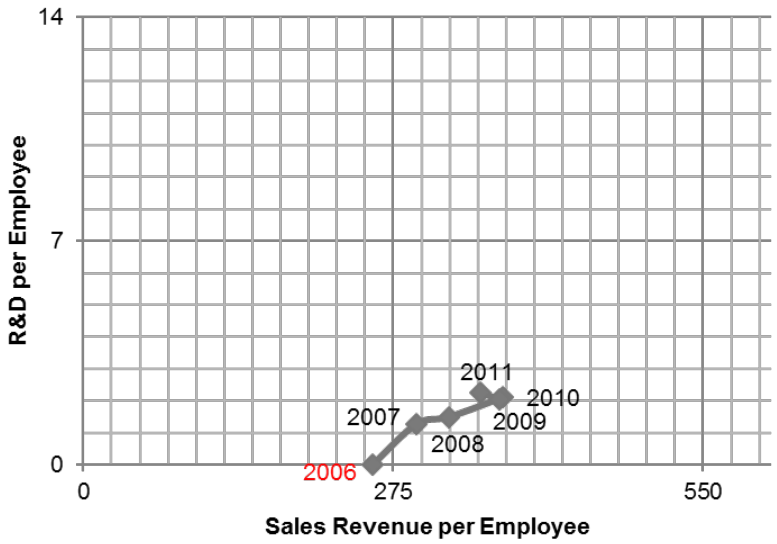

Fig 8: A SME Supplier with Low Creativity but High Productivity

The company has not established any R&D investment guideline or criteria. R&D investment, however, reaches 0.5% of sales revenue every year. The company makes profit through the

commercialization of their research and business ideas. They conduct R&D activities in connection with their business strategy, targeting the volume production of new products within 1 or 2 years. They decide which products to develop in advance. They focus on productivity development by improving facilities, workers, material, and work methods. The basic to improve is to maximize all resources efficiently. They divide this into two, controllable and non-controllable costs. They then classify based on them. They also focus on the reduction of controllable cost items such as material costs, labor costs, and some factory burden and commercial expense.

Before 2006, this company focused on memory rated substrate to assemble computers. At the same time, they developed package substrate including FBGA and FC-CSP whose gross potential market is big. After 2006, they focused on developing FC-CSP substrate for AP, and FC-CSP for BB, and FBGA substrate. By doing this, they were able to improve the productivity whilst making continuous, albeit small investments.

Result Company 8 This company performed better than the other one, but remained in Productivity Dependency nonetheless.

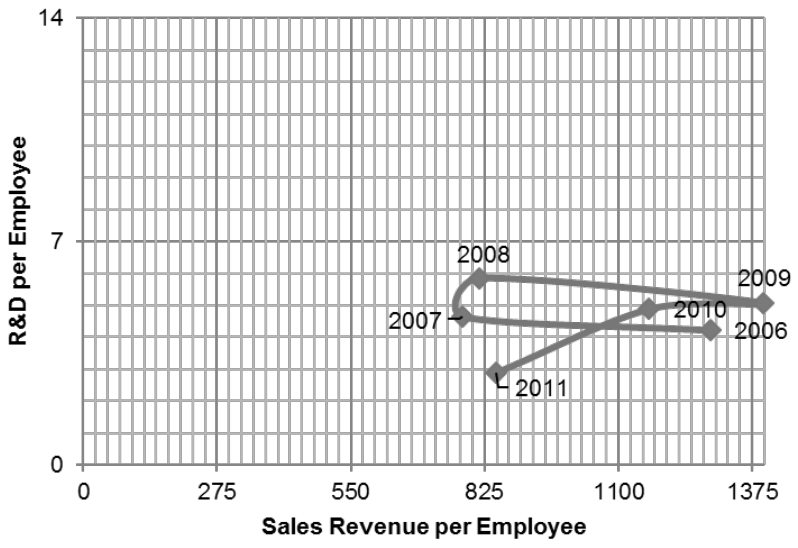

Fig 9: High Performer on Productivity Dependency

The company does not have any guideline for R&D investment as 90% of their sales revenue comes from OEM products. They invest actively on the education of R&D workers, facilities, and special tooling. The company exploits the overseas market through mega dealership (economies of scale). In terms of the new product development, they develop new product which the market demands. They also consider IT trend and reflect this to the new product. When developing new products, they incorporate our company's values and philosophy. They consider the appropriate margin when determining sales price. They also have a weekly meeting to manage the cost of major products by cost element. Based on this, the company establishes the cost improvement plan. They also set target costs considering the acceptable profitability. The decrease in sales revenue in 2007 was driven by the global financial crisis. The increase in 2009 is attributable to the operation of a new plant. The increase in 2010 and 2011 was due to higher sales of their low-cost models including DLC.

Strategic Implications

In the midst of swift technological advancements and stiff competition, firms cannot rely on current successes alone. Now more than ever, the need for creative innovation brought about by R&D should be put in the forefront. This means going beyond one time success and opting for recurring victories by building not only current but also new and future competitive advantages, as exemplified by the companies whose evolution tracks we have analyzed. To attain sustainability and corporate longevity, firms must follow the examples of the companies in our study and aim towards achieving the virtuous cycle.

References available upon request