

A Comment on Absorptive Capacity, Entrepreneurial Leadership and High-Velocity Markets

**Raushan Gross
Pfeiffer University**

This comment presents a new theoretical perspective on absorptive capacity (ACAP) and its nexus between entrepreneurial leadership and innovation patterns in high-velocity markets. High-velocity markets have five main characteristics: rapid-fire technological changes, short product life cycles, rapidly evolving customer expectations, frequent launches of new competitive moves, and the entry of critical new rivals. Firms operating in high-velocity markets have significant innovative imperatives than firms that operate in nonvolatile markets. Under certain market conditions, knowledge and innovative pattern trajectories may change based on the internal knowledge intake and assimilation of that knowledge to harness marketplace opportunities. Firms operating in high-velocity markets rely on knowledge that can be realized and transmitted in conjunction with entrepreneurial decision-making.

Keywords: absorptive capacity, knowledge, entrepreneurial leadership, innovation, technology S-curve

INTRODUCTION

Faced with many challenges congruent with opportunities, a firm reacts to a continuous advent of technological advances and operating methods in a market economy. The present market economy's reality is that product and other technology iterations and quick-to-market activities are happening to a much greater degree in high-velocity markets. The past does not represent what the future will bring. However, an internal process of absorptive capacity (ACAP) makes future decision making for entrepreneurial leaders useful in the long run. The caveat is a variety of firms that operate in high-velocity markets, where decisions are posed and executed in the short run. However, firms have a natural tendency to take advantage of economies of scale or scope through futuristic means to sustain themselves in high-velocity markets in the long-run. *Does the entrepreneurial leadership of a firm adjust the innovation patterns from a state of rigidity to fluidity based on knowledge acquisition, or do they attempt at breaking away from established innovation patterns?*

Firms in high-velocity environments can grow, adapt, and perform at the highest speed to market (Srikanth & Mohanavel, 2017). This comment is timely and helps examine a gap between knowledge and innovation patterns. Additionally, this comment explores the consequences of ACAP on entrepreneurial decision making and the discontinuous or continuous innovation patterns (IP) in the context of high-velocity markets. High-velocity markets "render imprecise, unavailable or obsolete information at the disposal of firms to formulate their strategy, thus generating a high degree of uncertainty to be dealt with," said Srikanth and Mohanavel (2017, p. 2), which aligns with a motivation for this comment.

Additionally, strategic planning in the conventional sense poses quite the challenge for entrepreneurial leaders in markets and industries characterized as high velocity (Wirtz et al., 2007). For this reason, the current paper provides a new way of understanding the effects of knowledge, the knowledge problem, and how ACAP never gets to equilibrium (i.e., the supply of external knowledge acquired at the level needed and then converted internally) because of its perpetual motion in high-paced environments. Moreover, the perspective of this comment elucidates the notion that strategic planning should be viewed as a process, a process that includes new knowledge and assimilation methods that serves eventually toward commercialization, and as a result, embeds the entrepreneurial elements. Planning in the conventional sense removes the entrepreneurial element, which in consequence dismisses new knowledge that can change the nature of a firm's innovation patterns. With this, entrepreneurial leaders have to decide on the knowledge that will affect the long-run IP in the short run. This view remains unaddressed in the management and strategic literature. Therefore, the high-velocity market strategy that serves as the underpinning for explaining the consequences of ACAP is proactiveness, replication, and reconfiguration. Abernathy and Utterback (1978) were the frontrunners of categorizing IP. Abernathy and Utterback (1978) categorized IP as fluid, transitional, and specific¹. ACAP, at any rate or flow, seems to require IP to switch and adjust from either a state of rigidity or fluidity of process or product. To ascertain the connection between high-velocity markets and IP and understand this view, Oliver (2012) said, "High-velocity markets make existing resources, capabilities and core competencies less relevant and less likely to yield competitive advantage. These resources need to be reconfigured, renewed, refreshed and adapted for superior firm performance" (p. 4).

The current inquiry into the nexus between IP and entrepreneurial leaders' decisions has not been examined in the management or strategy literature. Entrepreneurial leadership (EL) has been elucidated in previous studies on its effect on the innovating firm, especially within the operation of the flexible firm. A derivative of entrepreneurial behavior is innovation and observable IP. This comment assumes that EL and IP are influenced by ACAP. The influence of ACAP changes the trajectory of the S-curve pattern of firms. As the firm absorbs and realizes potential knowledge, it can severely impact a firm's future course of action. Knowledge is either organizational (i.e., soft) or technical (i.e., hard). The second assumption is that the firm's EL is the purveyor of innovation, establishing patterns. The synthesizer of the resources needed to carry out particular innovation within the firm's confines is motivated by knowledge. Carl Menger (2007) stated, "Nothing is more certain than that the degree of economic progress of mankind will still, in the future epochs, be commensurate with the degree of progress of human knowledge" (p. 74). This refers to the need for knowledge and the importance of knowledge in the market economy. This paper couches knowledge (i.e., ACAP) within the firm's imperative nature and seeks to explain how the firm's individuals acquire knowledge and employ it in high-velocity firms. The market response and adjustment of a firm to high-velocity market demands exemplify the decision-making unit's ability to employ EL capabilities (Eisenhardt & Martin, 2000). These comments focus on connecting a firm's ACAP influences on EL decision making, which changes the firm's trajectory of IP, thereby creating upward pressure on its S-curve. Therefore, ACAP pushes the S-curve of the firm's products and technologies over and across the chasm, beyond the parameters of performance and effort. In any case, ACAP has consequential effects on the firm to push the S-curve across the chasm, directly influencing EL decision making. When individuals acquire knowledge from various external pockets, it changes the data and the conditions of future strategies related to IP. Also, coincidentally, the firm does not hold the memory of learning or knowledge per se; it is the firm's individuals who hold memory and learn from the market. Cohen and Levinthal (1990) agreed, "An organization's absorptive capacity will depend on the absorptive capacities of its members" (p. 131). This comment is organized around six research questions, while the context is theoretical.

PURPOSE

The current paper intends to theoretically explain the managerial and strategic management literature to draw distinctive points about ACAP, determining its propensity to be entrepreneurial, innovative, and competitive. Furthermore, it highlights that when ACAP is obtained, assimilated, and exploited in high-

velocity markets, it has variable effects on a firm's S-curve. This process is postulated as the shifter of the firm's S-curve IP. A series of market phenomena have indicated noticeable IP shifts: phonograph, airplane, telephone, and computer television.¹ Den Hertog and Bilderbeek (1999) agreed that service IP and product IP differ in their visibility. ACAP, too, is invisible but can manifest itself in the production factors in developing a product.

The knowledge floating in various market ecosystems via market participants is harnessed through its market mechanisms and employed to pursue market ends.² The firm-level analysis has either expert or mundane knowledge that can transmute the firm's direction, only if it is not unconditionally locked into a strategic choice predating a new circumstance. Individuals and firms reward the best use of these knowledge bases acquired by market mechanisms, ultimately deciding what is and is not needed. However, all in all, there is a tendency to view knowledge as static or spontaneous. Hayek (1945) expressed that knowledge is uneven and decentralized--firms included. No given amount of knowledge is held by any one individual. Hayek was one of the first economists to use and explain the categorization of knowledge as either tacit or mundane. Organizational learning can be a continuous and complicated process for individuals within the firm (Lindsey & Norman, 1977). However, individuals use their knowledge along with ideas to pursue novel innovation (Schumpeter, 1934). Innovation happens due to the external market movements of economic change³. An overlooked point related to learning from the market process is the fits and starts that Schumpeter (1934) expressed as a rotating and irregular occurrence; the same is true of internal *potential and realized* learned capabilities. Firms respond to market signals, attempting to find profit opportunities amid market distortions. Entrepreneurial leaders acquire knowledge from customers, suppliers, and competitors. They learn from within and from without—an entrepreneurial leader's considerations and decision making to establish IP. Although there is a growing understanding of organizational flexibility's emergent nature, there is little clarity about the consequences of ACAP and assimilation of said knowledge to effect IP. Making decisions in high-velocity markets demands information and knowledge of the market. It also requires the decision-making capacity to use the transmutation, assimilation, and commercialization of that knowledge to apply to emerging innovation (Childs, 2015).

THEORETICAL BACKGROUND

Information and knowledge are critical to a firm's survival (i.e., profit or loss, competitiveness, market position, and strategy) in high velocity markets, because EL's use market signals to make judgments about the use of future resources so that ideas might become commercialized. The knowledge floating in various markets is harnessed through the market mechanisms and used to provide means to market ends. That knowledge is used to make decisions on the direction, targets, and strategic positioning of resources. This is not so much an individual result but individuals' collaborative effect within a firm's use of knowledge bases as observed by market signals that decide what is and what is not worth pursuing. However, there is a tendency to view knowledge as static—not as a continuous flow. High-velocity markets are unique in that they are volatile, uncertain, and experience unpredicted waves of uncertainty. Firms in such a market must be adaptable to change and rapid product and service deployment. High-velocity market conditions allow firms the ability to adapt the most effective way to sustain business in the long-term (Oliver, 2016). For these reasons, the technology S-curve is used as a yardstick for tracing the effects of ACAP and its diffuse effects on firm-level IP's. Diffusion S-curves are not all the same in what they model. Therefore, this comment seeks to focus on the technology S-curve, primarily because of its characteristics constructed on the basis of performance and effort due to the prospect of product and technological propensity to encounter diminishing performance over time.

LITERATURE REVIEW

High-Velocity and Innovation Patterns

Along with other essential terms in economics and later in management and strategic management is *innovation*—the propensity to innovate within the firm and in the ongoing internal process that enables innovation to flourish within its confines. The term innovation helps explain individual behavior and its market response to new market data and competitive pressures (Schumpeter, 1964). High-velocity environments exist in market economies where firms position for market share, resource scarcity, knowledge costs, and configuring lag and lead time for innovative projects. The firm's lag and lead time to innovation are critical to gaining market share because of rapid customer data changes. Carl Menger once said, all change consists of nothing but differences through time" (p. 122). Furthermore, competitiveness is more pronounced in high-velocity firms than it is in traditional industry structures in real time and the passing of time. The innovation process involves knowledge-oriented processes and resource-use processes that bring an idea to fruition. Knowledge-based processes are the vital capabilities of firms in high-velocity markets. The IP that establishes what a firm can and cannot pursue at a given cycle (i.e., fast, stable, and slow) are dictated by these capabilities. Many resources go into making strategy and implementing resources to their most urgent uses based on demand. But the question here is how to use it and formulate the knowledge into a formable process.

How does the firm's ACAP affect a firm's innovation patterns, from slow to accelerated, and the entrepreneurial response from leadership at any given time? While resources are essential, knowledge costs are imperative to IP development. EL, otherwise known as the purveyors of innovative patterns and resources, would be either positively or adversely affected by a firm's IP if ACAP alters in any way. It is one thing to choose a set of market options based on observable indicators (competition, pricing, technological advancements, and new products); it is a whole other process to choose from unknown and unrealizable observational indicators. Entrepreneurial leaders base their assumptions on market indicators that are known and some that emerge. Market indicators of innovative options are known as either target or strategic reference points within the market cycle. However, how do these options derail or direct IP? For the most part, IP rely on the contextual, timely, and error-free knowledge transmitted to entrepreneurial leaders at any point in time to make strategic innovation decisions. These decisions imply that knowledge needed to make innovation and technological advancement has to be somewhat defined to be employed. Moreover, ACAP is a nonneutral function. Wherever the knowledge gets injected in the firm, it is likely to be the catalyst for changes in how knowledge is realized, exploited, and transformed into useable market responses. Is there a concentrated benefit to the firm that initiates new knowledge to be later exploited? Are the costs of acquired new knowledge spread throughout the firm to later be commercialized?

This comment is timely. As firms recognize and assimilate internal and external knowledge to pursue goals and strategic aims, it becomes imperative to innovative advancement. Knowledge, coupled with externally derived sources from market pockets, has been theorized as a moderating effect on firms' strategic actions (Gross, 2017, 2018). Nevertheless, there is little understanding of ACAP consequences on IP and entrepreneurial leaders' strategic decision making in the contextual environment of high-velocity markets. Even less is mentioned in the strategic literature of the knowledge that is assimilated and exploited as forces create upward pressure on a firm's S-curve pattern. Firms in high-velocity markets change IP. At one moment, Path A is chosen, another Path B is chosen, and so on, thus changing the nature of paths (flexibility). The probability of success is acknowledged only through the lens of crossing the innovation chasm as a result of increased performance and effort. The axis of the technology S-curve represents the performance and effort of a technological product. But here there is a suggestion that the axis represents time and knowledge as innovation paths are pursued.

Just because there is a formulated innovative path does not mean the innovation ought to be or should be brought to market. Ludwig von Mises (1956) helped with the notion by stating, changes in technological knowledge and in the demand of consumers as they occur daily in our time make obsolete many of the plans directing the course of production and raise the question whether or not one should pursue the path stated. (p. 502). A firm's paths often change in dynamic markets and are determined by more or less the

flow of ACAP. Technically, there will always be a knowledge problem regarding its employability under specific firm capabilities due to market and internal constraints. However, the focus is on the process and effect of that learning in determining IP, particularly in markets characterized as high velocity, including those firms that make constant and deliberate adjustments to market conditions.

Again, this paper intends to theoretically examine the managerial and strategic management literature to draw distinctive points related to a nonneutral injection of ACAP. ACAP determines the firm's propensity to be entrepreneurial, innovative, and competitive, but ultimately to show that ACAP is obtained, assimilated, and exploited and can alter and disrupt IP. There is a tendency to view ACAP in a linear direction—knowledge is externally assimilated to commercialization. There is a great deal of agreement on the vital role of knowledge management (Rai, 2011) where new knowledge may have a ripple effect on existing IP. Presented here is the contrary thesis; knowledge that has been acquired externally, based on the needs of the firm, minus market distortions, might change the innovation pattern and entrepreneurial decision making. Simply, does the firm continue with old plans with new knowledge or change pattern with new knowledge, and to what degree does innovation patterns change over time?

Externally derived knowledge is critical to a firm's innovative capabilities (Cohen & Levinthal, 1990). One of the ACAP points overlooked is the firm's prior knowledge and future knowledge differential, *post ante* acquisition of other market-based knowledge pieces. Cohen and Levinthal (1990) stated, "Prior related knowledge confer an ability to recognize the value of new information, assimilate it, and apply it to commercial ends" (p. 128). The two main factors of ACAP are *potential and realized capabilities*. What was not included in Cohen and Levinthal's assertion is how external knowledge acquisition has a wave, circular-like, movement. The firm's external market-based knowledge and the exploitation of said knowledge affect its propensity for innovation.

Absorptive Capacity

As Cohen and Levinthal (1990) outlined, ACAP has four dimensions: potential (acquisition and assimilation) and realized (transformation and exploitation). How does ACAP affect the propensity of innovation? How does ACAP affect a firm's strategic choice in high-velocity markets? A firm has given aims and goals for the future. To accomplish them, the firm uses resources from the factors of production. Typically, firms develop strategies based on known targets, market positions, or market-based objectives. However, what goes unnoticed in the mainstream literature is that a firm's aims, targets, or objectives are mostly unseen. Firms create market change—the character of high-velocity markets. The ACAP process as we know of it conceptually does not in any way account for error. There is no way to predict the new entrants, new rivals, or customer changes in expectations, as these variables change rapidly. This poses a knowledge problem for many firms that are trying to decide what is useful or useless for any given market strategic trajectory. Decisions are made based on the market's coordinating mechanism, albeit exchanges between individuals and between firms. More importantly, the unseen heightens the level of error of ACAP. The simple fact is that there is not enough knowledge in the general framework of a market economy and the ability to make sense of it in any space and time.¹

To date, there is no strategic model that accounts for error or illustrates a need to account for errors in EL strategic decision making. Strategic models do not and have not accounted for error in choice or error within ACAP. Although there are many analytical managerial tools, the inescapable imperative in a market economy is the absence of error. It attempts to give rise to the present and long-term consequences of working and planning in error related to the two main factors of ACAP (*realized and unrealized capacity*). Individuals carry out their plans in the marketplace, but they are based on the expectations that others will conduct their plans under the same set of circumstances and knowledge which can be related to EL's within firms. A learning organization continuously engages in the complex process (Lindsey & Norman, 1977) of the acquisition and use of error-prone knowledge. However, entrepreneurial leaders use a multitude of learning related to innovative knowledge. Some knowledge inflow and spillover effects have fits and starts due to economic changes external and market movements (Schumpeter, 1935). An overlooked point related to ACAP from market knowledge is the fits and starts that Schumpeter (1935) expressed as a rotating and irregular occurrence; the same is true of internal *potential and realized* learned capabilities. Firms respond

to market signals and ultimately attempt to find profit opportunities amid market distortions. In this way, ACAP responds to the market with data as firms learn something new. It changes the use and need of various internal capabilities. Firms may find pressure in the market to the acquisition of knowledge instead of learning by doing, which is the critical aspect of keeping abreast of industry developments. Thus, requiring adjustments to market investment. This knowledge is, however, especially the case in high-velocity markets.

P¹: ACAP negatively affects a firm's entrepreneurial decision making and IP.

P²: ACAP positively affects a firm's entrepreneurial decision making and IP.

Entrepreneurial Leadership

EL is rooted in both leadership and entrepreneurial thought. Entrepreneurship has been noted in several economic theorists, such as Schumpeter, Mises, Kirzner, Marshall, and Cantillon—just to name a few. On the other hand, leadership is one of the most widely studied phenomena related to a dynamic between two or more persons pursuing essential goals. Most, if not all, of the literature highlights the antecedents and determinates of EL, mostly with a focus primarily on top management acting as an entrepreneur or as an entrepreneurial business strategist. The entrepreneurial action most often connoted characteristics, skills, and attitudes toward organizational roles, tasks, and/or directing organizational strategies through leadership are combined as EL. There should be no confusion between entrepreneurial behavior and small business ownership, as Peter Drucker (2014) advised: “An enterprise also does not need to be small and new to be an entrepreneur” (p. 22). Drucker explained that entrepreneurship is about the creation of and investment in something qualitatively different from what is already in existence. Entrepreneurs create new customers, new markets, and new ideas. Entrepreneurship's essence includes having vision, forming new ventures, introducing new products, and initiating new production methods. On the other end, Mintzberg (1989) elucidated the entrepreneurial firm and structure are free from bureaucracies that do not allow innovation; meaning, there is a simple structure for the entrepreneurial firm. EL creates young and aggressive firms seeking new markets that pull away from status quo strategies. EL pursues strategic visions, which result from many types of experiences and human capital acquisition.² In sum, the entrepreneurial leaders, as such, are market error finders and market error correctors.

EL is a complex phenomenon that lies at the crosscurrents of many factors of a market economy and is often discussed at one or more levels of analysis (i.e., the firm, individual, or industry). EL at the individual level of analysis is evident within the firm that decides to pursue entrepreneurial patterns based on market-based realities and circumstances.³ Gupta et al. (2004) and many others have formulated a construct of EL contextually rooted not in the traditional entrepreneurial sense. EL can be defined as one with the role of displaying optimism and confidence and integrating a shared perception to reach common goals. In the same vein, Kuratko (2007) described EL as closely related to entrepreneurship with the caveat that the EL mindset “permeates the strategies of larger established organizations” (p. 5).

Kuratko (2007) identified four factors of EL: vision, growth, venture performance, and strategy formulation. Fernald et al. (2005) asserted that entrepreneurs are seekers of opportunities, need to achieve goals, are independent-minded, take risks, and are inventive. El-Namaki (1992) defined an entrepreneurial leader as someone who has conceptual skills and conceive of instrumental ideas, and are often not causally related to the organization. Roebuck (2011) described EL as using entrepreneurial behavior by finding and executing opportunities and managing changing circumstances. Similarly, Guta et al. described EL as the “leader who can operate in a highly unpredictable world and in which competitive action inexorably and rapidly erodes whatever advantage the firm may currently enjoy” (p. 1). They described entrepreneurial leaders as those who capture the essence of what emerges in uncertain environments and, more or less, does not abstain from what emerges in new market arrangements. Kansikas et al. (2012) said that entrepreneurial leaders tend to be “stress-resistant, unselfconscious, assertive, nonexperimental in their actions, conscientious, conformist and competitive” (p. 141) in high-velocity environments.

Fernald et al. (2005) suggested that vision, problem solving, decision making, risk taking, flexibility, and autonomy envelop the individual, entrepreneurially spirited leader's essential nature and personality. At the intersection of entrepreneurship and culture, Thurik and Wennekers (1999) explained that entrepreneurship and leadership cultivated within a society include "the attitudes and values toward work, production, wealth and saving, toward new information, invention and strangers, and finally toward risk and failure seem particularly relevant for economic growth" (p. 40). In reflection of previous studies, it is ascertainable how EL has often been unexplained concerning ACAP dependence. However, there is merit to the notion that managers whose role is to draw on decision-making for future strategies use entrepreneurial skills. In any firm, EL can be observed as the influence of catalysts provided by individuals in a collaboration that challenges, envisions, innovates, and is strategic. In high-velocity environments, firms whose economic capabilities are used for market-based opportunities diffuse into marketplace patterns. The nature of high-velocity markets requires entrepreneurial leaders to make rapid decisions about effective firm performance (Eisenhardt, 1989). As might be imagined, there is no concrete theory related to or descriptive of the sense that there must be a mode of propensity to action on the firm's part to enact innovative processes. In this same sense, is there a mode or propensity to innovate? There has to be an incubation period in which the firm has the capability and a structure to innovate. IP can be derived within the firm and recognized through the firm's resources and capabilities. Without the requisite capabilities, a firm cannot invest the time and energy into the risky activity of entrepreneurial decision making that can thrust IP. Suppose the firm is willing to acquire knowledge from external sources through a merger and acquisition or otherwise. There are no guarantees that this investment of knowledge acquisition will lead to the reward of long-term patterns of innovation. A unique factor needs further explanation—the firm's propensity to innovate. Perhaps this is a problem of standardization in which firms decide to remain on the *old system* and find that costs are too prohibitive or competitive to integrate ACAP into discovering useful IP. Does a firm with new information attempt to push the S-curve of technology or stick to the old system? In sum, the question remains: Does new knowledge shape new decisions, and do these new decisions change IP?

Many theorists have examined, tested, and hypothesized various aspects of the individual entrepreneur—the entrepreneurial action. However, few have made a clear distinction between their involvement with IP or lack thereof. Recently, the resurgence of the idea that entrepreneurial action and its connection with innovative behaviors, mostly as a booster of firm performance and driver of competitive positioning in markets, has led the direction in entrepreneurial literature. The very idea that leadership functions in a market system has been proclaimed (Mises, 1956) as one of the most important of any human action applied to entrepreneurship. Of course, the leadership action that would act most strongly in a competitive market is EL. Salerno (2008) explained that it is "the quality of leadership possessed by those who introduce new products or radically new methods of producing old products, the pioneers who discovered untapped markets or sources of supply" (p. 194). In this sense, the entrepreneur controls the capital and assumes the risks of using the capital employed to change conditions for customers' satisfaction and marketplace demands. Entrepreneurs seek ways to act in the market that reflect their purpose, skills, creativity, and ability to recombine resources based on external opportunities. How does EL, as a concept, work in practice? In this attempt to explain it, observations of the S-curve pattern of innovation is the exemplar to show the effects of ACAP as a reactor of time and knowledge. The marketplace should be an environment where risk-taking can be maximized and rewarded for those who exhibit entrepreneurial leadership.⁴

Innovation and Patterns

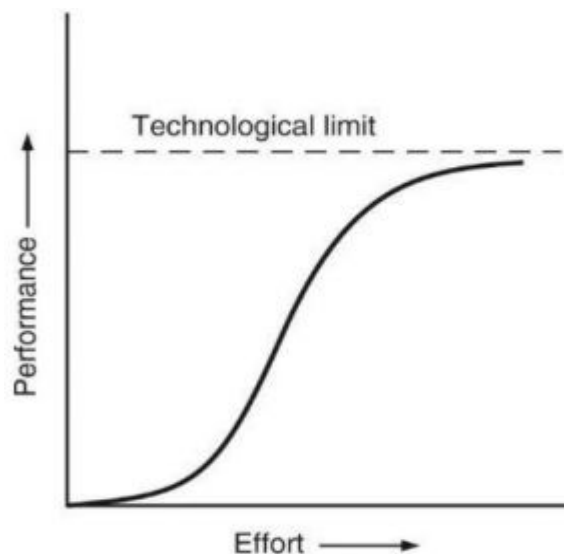
Abernathy and Utterback (1978) asked, "How does a company's innovation—and its response to innovative ideas—change as the company grows and matures?" (p. 3). There are circumstances in which a pattern associated with the internal process of ACAP should align with a company's strategic growth. When newly absorbed knowledge gets injected into the firm, the firm's gains are likely to concentrate on its units or diffuse across the firm. There is a normal tendency to combine a particular meaning when expressing entrepreneurship and innovation. It would be unwise to think of these two constructs otherwise, as

innovation requires individuals to make decisions on the long-run and short-run use of resources and the best use of production factors. In this case, the level of inquiry is the transition-based pattern of innovation. Abernathy and Utterback (1978) once defined three broad IP patterns: fluid, transitional, and specific. Some internal patterns start as rigid and transition to evolutionary patterns over time. Therefore, the notion of internal IP rests on internal knowledge and capabilities and entrepreneurial organizational controls. However, patterns change due to changes in market structure, competitiveness between firms, and the successive wave the market is in at a particular time. The main thread of IP is the factors that lead up to innovation and that align with production timetables. IP have not been explicated in models and lend themselves to the idea of a perpetual inflow of knowledge and rapid-fire decision making (Cho & Linderman, 2020).

The Influence of Entrepreneurial Leadership on the S-Curve Pattern

The S-curve is one of the most well-known descriptive models that explain the internal processes of introducing new technological products or novel internal processes. The S-curve displays new paradigm perspectives of older products that are overtaken by new products or processes with consideration of performance and effort. More than that, the S-curve acknowledges the product's inherent limits once new entrants introduce new technologies or when old technologies are entered into new innovation patterns. The current paper examines the S-curve from a new perspective—an entrepreneurial perspective—where new knowledge is the signal that changes the slope of the S-curve and EL decision making influences the lead and lag time of IP. That is, it is ACAP and entrepreneurial decision-making with the addition of time that in effect move the S-curve across the chasm. Christensen (1992a, 1992b) posited much about the management utility of analyzing the S-cure diffusion at the firm level of analysis that serves to guide strategic decisions. Christensen's assertion highlights four propositions. The four propositions reflect the nature of EL as a primary *leaping* mechanism over the *discontinuity* phase. EL as a shifter of the S-curve has yet to be examined or discussed in current research. However, the fact remains that the firm's internal barriers affect internal change; change can inhibit a *leap* in creating a competitive advantage to from new entrants that are more than likely to push the frontier of new technological products and internal processes. New entrants bring new technologies to the market that compete with incumbents because may be reluctant to increase entrepreneurial decision making, which reduces firms to a noncompetitive state.

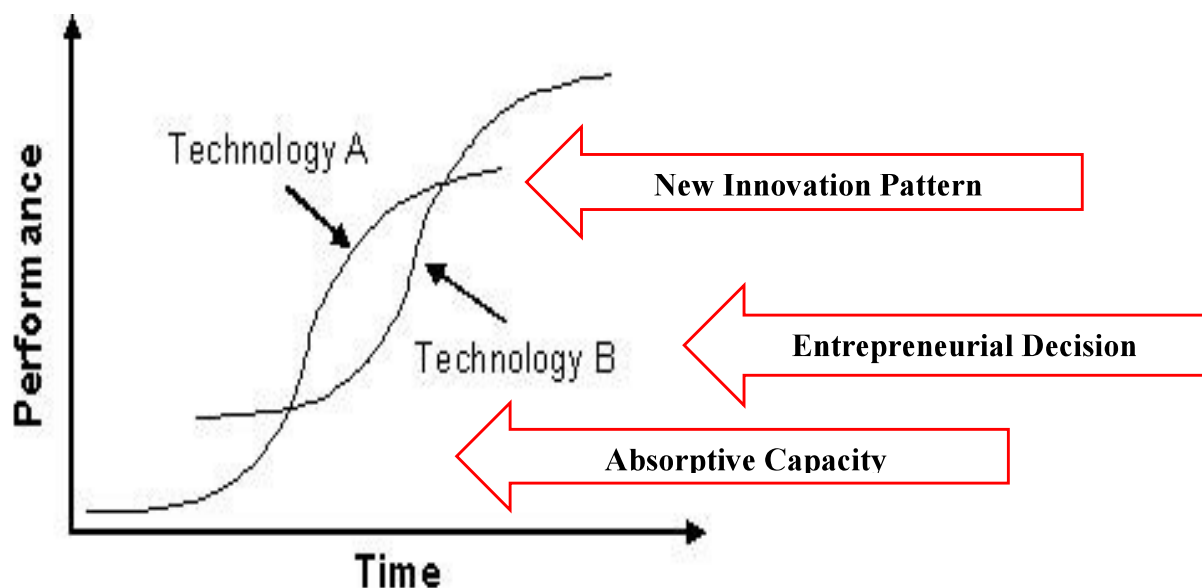
**FIGURE 1
TECHNOLOGY S-CURVE**



The technology S-curve has been one of the hallmarks of innovation and innovative practices by firms highlighting past and present dominant designs and how it depicts the effort and performance of incumbent responses to competitive firms. The technology S-curves measure effort, performance, establishing patterns of technological advances relative to the effort need to produce a product or technology against the tide of diminishing returns from the effort advanced. Industries change, and consumer perceptions alter throughout time. When consumer perceptions and wants change, the market alters its signals, whereby firms make decisions that allow for new developments or new entrants to fill the design void. To some degree, the technology S-curve accounts for the flattening of the micro-level firm-specific S-curve product effort, performance, engineering of product, and firm-level technological trajectory.⁵ Entrepreneurial firms understand the importance of market signals to make decisions related to innovation and product development. But what influence does the knowledge and information EL receive make the S-curve move to the position of discontinuity? Christensen (1992a) stated, “The industry’s leading incumbent firms were generally the most aggressive in switching to new component technology S-curves, but there is no evidence that they gained any sort of strategic advantage over firms that stayed longer with conventional componentry” (p. 3). There are firms that, for whatever reason, do not follow the conventional steps outlined in the diffusion model itself. Firms can bypass the fermentation phase of the S-curve, and the question is how and where they received the knowledge capability to move up the S-curve and cross the chasm swiftly. Along the same lines, the technology S-curve provides context on product and industry but does not reflect the high-velocity market’s nature.

The S-curve model displays the mature aggregate product and technology pattern performance, but is not laser focused on the differences between a firm and its knowledge level at any particular place and time. The S-curve is descriptive, and it shows the effects of performance and effort related to entrepreneurial choices during a particular time frame. However, more importantly, it shows the product and technology growth and the inherently increased effort in maintaining innovation patterns. As technology becomes diffuse through markets and customers are acquainted with its use, it reaches a state of maturity and incrementality additions may be added to form a new product, and the process of innovation (continuous or discontinuous) is a decision based on ACAP of entrepreneurial leadership.

**FIGURE 2
TECHNOLOGY S-CURVE WITH ACAP**



The ACAP process, entrepreneurial leadership decision making, and actions cause shifts in the S-curve related to whether or not to consider a change of plans related to performance, effort with the possibility of

diminishing returns, especially in high-velocity markets. Firm's ACAP, EL, and a strong entrepreneurial orientation, as internal effects might indeed be shifters of a firm's S-curve. This can be easily seen if effort and performance were replaced with knowledge and time. This assertion is definitive as the S-curve is expressed in static terms and not concerning the potential of individuals within the firm to absorb knowledge as one of the motivating causes of crossing the chasm. Six propositions for future exploration include the following:

P¹: In high-velocity markets ACAP negatively affects a firm's entrepreneurial decision and IP.

P²: In high velocity markets ACAP positively affects a firm's entrepreneurial decision making and IP.

P³: In high-velocity markets a firms' S-curve is altered by new ACAP.

P⁴: In high-velocity markets a firms newly acquired ACAP does not negatively alter IP.

P⁵: In high-velocity markets a firms' EL decisions based on new ACAP is neutral toward IP.

P⁶: In high-velocity markets a firms' ACAP changes EL decision making, which leads to continuous or discontinuous changes in the direction of IP.

DISCUSSION AND CONCLUSION

This study poses critical questions at the intersection of ACAP processes and changes in IP influenced by EL decision making in a given firm. This paper provides comments to establish a research agenda in entrepreneurial theory and a new way of thinking about S-curve patterns. One factor to consider is the size of the firm. Drucker (2014) stated, "An enterprise also does not need to be small and new to be an entrepreneur."⁶ The current paper's comment's guiding perspective is that EL employs human capital, which guides S-curve patterns. The secondary guiding perspective is that entrepreneurial leaders' decision making toward innovation has to provide a climate that supports the emerging environment for innovation to develop. Is EL a multifaceted construct related to the firm's knowledge acquisition and transmutation to commercializing products? Does ACAP directly influence EL within a firm in high-velocity markets? How does EL impact human capital's use and investment and the reengagement of human capital according to new market waves? Moreover, what role do entrepreneurial leaders play in firm-level innovative dynamics across the firm?

While the need for creativity and innovation at the firm level is essential and has been extensively researched. There is not enough attention in entrepreneurial and innovation literature about the dynamic nature of ACAP consequences on EL decisions and patterns of innovation. Perhaps the propensity of knowledge linked with innovation has become less critical than the realized *ex-post* innovation. While this may be the case, there is untapped gold in this vein because "it is important to distinguish between a firm's willingness or 'readiness' to innovate and the outcomes which result from this" (Klass & Wood, 2009, p. 2). However, we must integrate the propensity to innovate due to market activity with knowledge acquisition, competition, high-velocity firms, markets, and industries. Hormiga et al. (2013) examined the propensity to innovate at the individual level—primarily human capital. There tends to be significant agreement between Hormiga et al. and Fontana et al. who felt that "Innovative propensity flourishes when the organisation encourages it, when employees are motivated to think and pursue new ideas, and when the organisation provides employees with the resources they need to play with these ideas in generative ways" (p. 40). Many intricate moving parts of the enterprise have an indirect and direct impact on a firm's ability to create and sustain innovation. These intricate moving parts, however, in this case, are enveloped and integrated into a cyclical theoretical interpretation called coiling and recoiling effects. The current paper attempted to connect knowledge and the use of knowledge and the inner workings of what makes the S-curve move toward crossing the *chasm*. A firm is likely to internally establish IP, but this is assumed to be

ACAP as the determinate and not the antecedent. Along these same lines, very few studies have acknowledged EL's role in IP in market economies and the impact on learning curves and spillover effects. This study proposed EL decision making intensifies entrepreneurship proclivities as well as disrupting IP.

ENDNOTES

1. There is tacit knowledge, mundane knowledge, and technical knowledge. However, beneath these surfaces, there are no other knowledge descriptions that can be absorbed in a firm that link directly or indirectly with innovation.
2. Henry Mintzberg (1989) used an excellent example of visionary leadership when he quoted Lee Iacocca as growing up in the automobile business where he went from Chrysler to Ford.
3. Market realities and circumstances are various elements in which the market rotates, such as new competitors, prices, and customer changes in preferences. This idea of market realities and circumstances relates to whether or not to innovate to keep up with the industry or if a product or service requires more resources to stay relevant to its intended customer.
4. In *The Flowering of the Third America*, Maury Klein talked about the market as being dynamic and not static as it pertains to entrepreneurs. The environment has to be open to a range of choices and options and should not be constrained toward new ideas when individuals pursue an economic interests.
5. Christensen (1992a) mentioned the details of the S-curve theory.
6. Drucker (2014) gave examples of General Electric as being entrepreneurial in many of their lines of products and credit servicing units. He also spoke of McDonald's as the epitome of entrepreneurship because they saw the *value* to customers and improved and renewed their processes and tools to generate new customers and new markets.
7. Abernathy and Utterback's (1978) focused on the transition between patterns and certain conditions that manifest themselves as the internal conditions that support increased innovative technological changes. They provided examples of radical transition innovations with Texas Instruments and the electric light bulb—having gone through multiple innovative revolutions.
8. Scott Shane (2009) provided a list of firms' failures to foresee future market changes and provided six reasons why the S-curve shifts.
9. Fredrick A. von Hayek (1980) made numerous points about the individual nature of knowledge and its dispersion across many people in society in *Individualism and Economic Order*.
10. In *The Analysis of Economic Change*, J. A. Schumpeter (1935) determined there are three wave/cycle schemas: long, medium, and short. These waves/cycles are called Kondratieff cycles that last 40-60 years, Juglar cycles that last 7-11 years, and Kitchin cycles that last 0-3 years. The importance of these cycles is that they create changes in the market, moving away from equilibrium. Examples include the first wave Industrial Revolution, second wave of steam and steel, and third wave of electrical developments.
11. There is tacit knowledge, mundane knowledge, and technical knowledge. However, beneath these surfaces, there are no other knowledge descriptions that can be absorbed in a firm that link directly or indirectly with innovation.
12. Henry Mintzberg (1989) used an excellent example of visionary leadership when he quoted Lee Iacocca as growing up in the automobile business where he went from Chrysler to Ford.
13. Market realities and circumstances are various elements in which the market rotates, such as new competitors, prices, and customer changes in preferences. This idea of market realities and circumstances relates to whether or not to innovate to keep up with the industry or if a product or service requires more resources to stay relevant to its intended customer.
14. In *The Flowering of the Third America*, Maury Klein talked about the market as being dynamic and not static as it pertains to entrepreneurs. The environment has to be open to a range of choices and options and should not be constrained toward new ideas when individuals pursue an economic interests.
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REFERENCES

- Abernathy, W.J., & Utterback, J.M. (1978). Patterns of Industrial Innovation. *Technology Review*, 80(7), 40-47.
- Childs, J. (2015). *Organization: Contemporary principles and practice*. John Wiley & Sons.
- Cho, Y.S., & Linderman, K. (2020). Resource-based product and process innovation model: Theory development and empirical validation. *Sustainability*, 12(3), 913.
- Christensen, C.M. (1992a). Exploring the limits of the technology S-curve. Part I: component technologies. *Production and Operations Management*, 1(4), 334-357.
- Christensen, C.M. (1992b). Exploring the limits of the technology S-curve. Part II: Architectural technologies. *Production and Operations Management*, 1(4), 358-366.
- Cohen, W.M., & Levinthal, D.A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, pp. 128-152.
- Den Hertog, P., & Bilderbeek, R. (1999). *Conceptualising service innovation and service innovation patterns*. Research Programme on Innovation in Services (SIID) for the Ministry of Economic Affairs, Dialogic, Utrecht.
- Drucker, P. (2014). *Innovation and entrepreneurship*. Routledge.
- Eisenhardt, K.M. (1989). Making fast strategic decisions in high-velocity environments. *Academy of Management Journal*, 32(3), 543-576.
- Eisenhardt, K.M., & Martin, J.A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21(10-11), 1105-1121.
- El-Namaki, M.S.S. (1992). Creating a corporate vision. *Long Range Planning*, 25(6), 25-29.
- Fernald, L.W., Solomon, G.T., & Tarabishy, A. (2005). A new paradigm: Entrepreneurial leadership. *Southern Business Review*, 30(2), 1-10.
- Fontana, F., D'Alise, C., & Marzano, M.A. (2015). Incentives and innovative propensity. *Review of Contemporary Business Research*, 4(2), 39-56.
- Gross, R. (2017). Exploring the moderating impact of absorptive capacity on strategic thinking, innovative behavior, and entrepreneurial orientation at the organizational level of analysis. *Journal of Management Policy and Practice*, 18(3), 60-73.
- Gross, R. (2018). Exploring the influence of slack resources and absorptive capacity on strategic flexibility using the Miles and Snow taxonomy: A review and future research agenda. *Journal of Applied Business & Economics*, 20(5). <https://doi.org/10.33423/jabe.v20i5.363>
- Gupta, V., MacMillan, I.C., & Surie, G. (2004). Entrepreneurial leadership: Developing and measuring a cross-cultural construct. *Journal of Business Venturing*, 19(2), 241-260.
- Hayek, F.A. (1945). The use of knowledge in society. *The American Economic Review*, 35(4), 519-530.
- Hayek, F.A. (1980). *Individualism and economic order*. University of Chicago Press.
- Hormiga, E., Hancock, C., & Valls-Pasola, J. (2013). The relationship between employee propensity to innovate and their decision to create a company. *Management Decision*.
- Kansikas, J., Laakkonen, A., Sarpo, V., & Kontinen, T. (2012). Entrepreneurial leadership and families as resources for strategic entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 18(2), 141-158. <https://doi.org/10.1108/13552551211204193>
- Klass, D., & Wood, M. (2009). *Propensity to innovate: Driving innovation in a professional services firm*. ANZAM 2009.
- Klein, M. (1993). *The Flowering of the Third America: The Making of an Organizational Society* (pp. 1850-1920). Chicago, IL: Ivan R Dee.
- Kuratko, D.F. (2007). Entrepreneurial leadership in the 21st century: Guest editor's perspective. *Journal of Leadership & Organizational Studies*, 13(4), 1-11.
- Lindsey, P.H., & Norman, D.A. (1977). *Human Information Processing. An introduction to psychology*. New York, NY: Academic Press.
- Menger, C. (2007). *Principles of Economics*. Auburn, AL: Ludwig von Mises Institute.

- Mintzberg, H. (1989). *Mintzberg on management: Inside our strange world of organizations*. Simon and Schuster.
- Mises, L.V. (1956). *Human action* (the scholar's ed.). Auburn, AL: Mises Institute.
- Oliver, J.J. (2012). Winning in high-velocity markets: The case of BSKyB. *Strategic Direction*, 28(10), 3-5. doi: <http://dx.doi.org.pfeiffer.idm.oclc.org/10.1108/02580541211268366>
- Oliver, J.J. (2016). High-velocity markets drive adaptive capabilities. *Strategic Direction*, 32(1), 5-7. doi: <http://dx.doi.org.pfeiffer.idm.oclc.org/10.1108/SD-07-2015-0111>
- Rai, R.K. (2011). Knowledge management and organizational culture: A theoretical integrative framework. *Journal of Knowledge Management*, 15(5), 779-801. doi: <http://dx.doi.org.pfeiffer.idm.oclc.org/10.1108/13673271111174320>
- Roebuck, C. (2011). *Critical need for entrepreneurial leaders during turbulent times*. Retrieved from <http://chrisroebuck.co/blog/critical-need-for-entrepreneurial-leadersduring-turbulent-times>
- Salerno, J.T. (2008). The entrepreneur: Real and imagined. *The Quarterly Journal of Austrian Economics*, 11(3-4), 188-207.
- Schumpeter, J.A. (1934). *The theory of Economic Development*. New Brunswick, NJ: Transaction Publishers.
- Schumpeter, J.A. (1935). The Analysis of *Economic Change*. *The Review of Economics and Statistics*, 17(4), 2-10.
- Schumpeter, J.A. (1964). *Business cycles: A theoretical, historical and statistical analysis of the capitalist process* (Abridged, with an introduction by Rendigs Fels). McGraw-Hill.
- Shane, S. (2009). *Technology strategy for managers and entrepreneurs*. Upper Saddle River, NJ: Pearson Education.
- Srikanth, J., & Mohanavel, S. (2017). *High-velocity enterprises—A strategic perspective*. Institute of Technology, Coimbatore.
- Thurik, R., & Wennekers, S. (1999). Linking entrepreneurship and economic growth. *Small Business Economics*, 13(1), 27-56.
- Wirtz, B.W., Mathieu, A., & Schilke, O. (2007). Strategy in high-velocity environments. *Long Range Planning*, 40(3), 295-313.