DECOUPLING MARKET INCUMBENCY FROM ORGANIZATIONAL PREHISTORY: LOCATING THE REAL SOURCES OF COMPETITIVE ADVANTAGE IN R&D FOR RADICAL INNOVATION

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The creative destruction literature has argued that differences in R&D performance of incumbent vs. entrant firms can be explained through organizational change theories about established vs. de novo firms. A disconnect exists between these theories and the available empirical evidence because often the best performing firms are established firms as well. I propose to resolve this disconnect by distinguishing between market incumbency (presence in a market prior to a discontinuity) and organizational prehistory (organizational experience prior to a transition, whether between technologies or between markets). Doing so allows me to contrast incumbent vs. entrant and de alio vs. de novo studies, and to suggest more robust future research designs. I illustrate my proposition using qualitative data from the anticancer and AIDS-treatment drug markets. Copyright © 2012 John Wiley & Sons, Ltd.

INTRODUCTION

A central concern in the creative destruction literature (Schumpeter, 1934, 1950) is to account for the differences in research and development (R&D) performance between incumbent and entrant firms when a radical change in technological regimes disrupts a market, generating a ‘discontinuity.’

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1 I use the term ‘technological regime’ as in Anderson and Tushman (1990: 611) to refer to a knowledge base used in R&D (e.g., mechanical engineering vs. electrical engineering as a basis for typewriter development). I use ‘market’ as in microeconomic theory to refer to a set of products that are substitutes for one another.

In fact, incumbents’ systematic underperformance in R&D against competitors is widely considered one of the main explanations for their market failure (Henderson, 1993). Incumbents’ underperformance in R&D is so prevalent that studies find these firms underperforming even when they retain market share thanks to the ownership of complementary assets (Teece, 1986; Tripsas, 1997). Given the salience of this underperformance and the significant interest across disciplines in the ability of established firms to generate innovations (see Stinchcombe, 1965 in sociology; Scherer, 1980 in economics; and Foster and Kaplan, 2001 in management), understanding the determinants of the...
differences in the R&D performance of incumbents and entrants is critical.

Creative destruction studies have explained differences in the R&D performance of incumbent vs. entrant firms through theories about the ability to change of established vs. de novo firms (e.g., Nelson and Winter, 1982; Hannan and Freeman, 1984). These theories trace established firms’ inability to change to the inertia produced by their organizational prehistory (e.g., Helfat and Lieberman, 2002). However, incumbent firms are not the only firms with a prehistory in empirical studies. The entrants that outperform incumbents in R&D are often entrants diversifying from other industries, entrants that have their own prehistory. If both low performing incumbents and high performing entrants have a prehistory, the only explanation for the difference in outcomes would be that the two groups faced different types of prehistory, a conclusion rarely examined in the literature. Therefore, the theoretical explanation offered for the differences in outcomes would be that the two groups faced different types of prehistory, a conclusion rarely examined in the literature. Further, the lack of an adequate theoretical explanation hinders the ability of scholars to make strategic recommendations. For example, if the reason behind incumbents’ underperformance is no longer the mere existence of their prehistory, then recommendations to improve incumbents’ performance by adopting the characteristics of firms without prehistory (i.e., de novo firms) are ill fitted.

To resolve this disconnect between explanation and evidence, I propose to decouple the two theoretical constructs of market incumbency (presence in a market prior to a discontinuity) and organizational prehistory (organizational experience prior to a transition, whether between technologies or between markets). In doing so, I can appropriately contrast incumbents and diversifying entrants in the R&D race that arises in pursuit of a discontinuity. Furthermore, I can compare research on incumbent vs. entrant firms with studies on de alio vs. de novo firms. As I will explain, the latter studies observe markets from birth and for no more than one technological regime, and therefore their samples include no incumbents (e.g., Carroll et al., 1996; Klepper and Simons, 2000). Ultimately, I arrive at recommendations for research design to help future work empirically identify the true determinants behind the differences in R&D performance across groups of firms in a discontinuity and thus generate appropriate strategic recommendations.

For illustration throughout the paper, I compare qualitative data on two discontinuities: the transition of the anticancer drug market into biotechnology and the emergence of the AIDS-treatment drug market.

**BACKGROUND: R&D PERFORMANCE DIFFERENCES AS DETERMINANTS OF THE MARKET PERFORMANCE DIFFERENCES OF INCUMBENTS AND ENTRANTS**

A cornerstone of the creative destruction literature is the study of discontinuities. By altering the value of the standing capabilities of incumbents, discontinuities allow entry and can alter the distribution of profitability across firms within a market. The interest of creative destruction research in differences in the market performance of incumbents and entrants thus speaks to mainstream strategy’s objective of explaining heterogeneity in firm performance within a market (e.g., Rumelt, 1991; McGahan and Porter, 1997). Consequently, a significant portion of the creative destruction literature has focused on understanding the determinants of such differences.

Differences in R&D performance in the new technology is one of three broad determinants of differences in the market performance of incumbents and entrants, the other two being differences in investment and differences in the ownership of complementary assets (Teece, 1986; Henderson, 1993; Tripsas, 1997). Studies documenting detailed mechanisms (for a comprehensive review, see Chesbrough, 2001) fall into one of these three categories. For example, underinvestment is seen in works discussing how a lack of managerial attention to a new technological regime can explain incumbents’ demise (e.g., Tripsas and Gavetti, 2000; Kaplan, Murray, and Henderson, 2003; Kaplan and Tripsas, 2008; Eggers and Kaplan, 2009). Tripsas’s (1997) study of incumbents’ reuse of product complements is an example of how incumbents can sustain market performance through the use of complementary assets. Finally, differences in R&D performance are found in Henderson’s (1993) discussion of incumbents’
less effective product development after an equivalent investment, and in the discussion of diseconomies of scope that emerge when incumbents execute R&D in a new technological regime (Bresnahan, Greenstein, and Henderson, 2011).

Each of the three determinants of differences in market performance has been explained using separate theories. For example, some researchers have referenced cannibalization models (e.g., Reinganum, 1983) to explain why underinvestment takes place (e.g., Henderson, 1993), or the theory of the firm (e.g., Teece, 1986) to explain why there are differences in ownership of complementary assets (e.g., Tripsas, 1997). In this paper, I focus on differences in R&D performance across groups of firms and thus on the theories used to explain these differences. I review these theories next.

THE DETERMINANTS OF DIFFERENCES IN R&D PERFORMANCE BETWEEN INCUMBENTS AND ENTRANTS

The creative destruction literature has used firm size (e.g., Acs and Audretsch, 1987), firm age (e.g., Stinchcombe, 1965 in sociology; Agarwal and Gort, 2002 in economics), and firm prehistory (e.g., Nelson and Winter, 1982; Hannan and Freeman, 1984) to theoretically pin down the determinants of differences in R&D performance between incumbents and entrants. Because firm size and age can be empirically measured separately from market incumbency, I concentrate on the literature dealing with prehistory.

In explaining how prehistory can affect R&D performance by turning into the disadvantage of inertia, this literature focuses on capability reuse at the level of the organization (e.g., Nelson and Winter, 1982; for a discussion beyond the boundaries of the organization, see Afuah and Bahram, 1995). The prehistory literature identifies two related and fundamental mechanisms.

The first is capability misalignment in which prehistory becomes a source of structural inertia (Hannan and Freeman, 1984). This mechanism refers to the size of the gap between current and newly required capabilities (Helfat and Lieberman, 2002). The more misalignment an organization faces, the lower it will perform in R&D compared with competitors simply because a greater number of capabilities need to be renewed to match the performance of competitors, leaving scientists with suboptimal tools in the meantime.

The second mechanism is the propensity for competency traps in which prehistory becomes a source of cognitive inertia (Levitt and March, 1988; Levithal and March, 1993). A competency trap occurs when an organization cannot identify current misaligned capabilities and inappropriately insists on their reuse instead of renewing them. The higher an organization’s propensity for competency traps, the lower it will perform in R&D because mistakenly reusing capabilities that should be renewed leads to a delay in catching up with competitors in addition to the delay caused by misalignment. Indeed, competency traps could lower R&D performance even in cases when misalignment could be speedily corrected because the organization is unable to identify which capabilities to renew.

To better understand how both mechanisms affect R&D performance, consider a hypothetical example based on the transition of the typesetter industry from analog to digital (Tripsas, 1997). In the case of misalignment, mechanical engineers would need to be replaced with optomechanical engineers as the discontinuity unfolds. While working to replace them, incumbent typesetter manufacturers would design typesetters using teams that still include mechanical engineers, resulting in typesetter designs that print fewer newspaper lines per minute than those of competitors. The other mechanism is competency traps, in which mechanical engineers would again need to be replaced with optomechanical engineers, but incumbent firms could not pinpoint this issue. While waiting to identify the human resources that need replacement, these firms would, just as before, design typesetters using teams that still include mechanical engineers and would again generate typesetter designs suboptimal to those of the competition.

Classic evidence of these mechanisms is found in Leonard-Barton (1992). In the author’s careful description of a series of projects, one can see that some are the attempts of a market incumbent to innovate (e.g., Ford Motor Co. generating a new compressor for an air conditioner system) and some are the attempts of a firm to diversify into other markets (e.g., Chaparral Steel generating a new electric arc saw). Irrespective of incumbency, projects were indistinguishably difficult to pursue...
when they were misaligned with the core capabilities of the firm. Capability misalignment and competency traps stemming from the firm’s prehistory turned core capabilities into core rigidities.

All firms with capabilities acquired prior to facing a change possess a prehistory that can turn into inertia. In the creative destruction literature, incumbent firms are not the only firms with prehistory (for a comprehensive discussion, see Agarwal and Helfat, 2009). A second look at classics in the creative destruction literature reveals how significant a role entrants with prehistory (i.e., diversifying entrants) play in a discontinuity. Diversifying firms have a presence among entrants (e.g., Dunne, Roberts, and Samuelson, 1988). Diversifying entrants can also be among the highest R&D performers (e.g., Henderson and Clark, 1990) and ultimately among the best market performers (e.g., Tilton, 1971). Furthermore, in spite of their superior performance over incumbents, research has found that diversifying entrants, like incumbents, do face their own ‘productivity dilemma,’ hindering their ability to innovate (Mitchell and Singh, 1993). In fact, diversifying entrants, like incumbents, have been found to exhibit inertia (King and Tucci, 2002; Benner and Tripsas, 2012).

This is the key to the disconnect between theory and evidence that I highlight in this paper. Incumbent firms are not the only firms with a prehistory in empirical studies. Diversifying entrants also have a prehistory. It is possible for the prehistory of either group to turn into a disadvantage, and as of yet there has been no systematic examination of possible differences between the prehistories of these two groups of firms. Current evidence of the persistent difference in R&D performance between incumbent and diversifying firms does not have a theoretical explanation consistent with the data. My argument in this paper is that the first step in finding that appropriate explanation is to distinguish between two constructs that differentiate between prior experience in a specific market and prior experience as an organization.


DECOUPLING MARKET INCUMBENCY FROM ORGANIZATIONAL PREHISTORY

Definitions

I present a definition of prehistory in line with the prehistory literature (e.g., Helfat and Lieberman, 2002) that appropriately decouples it from incumbency:

**Définition 1:** Organizational prehistory refers to a firm’s accumulated corporate history, that is, to the presence of resources and capabilities accumulated by the firm through previous operations. Organizational prehistory therefore reflects whether a firm has a corporate history or is starting anew. When measured as a binary variable, it translates into the dichotomy of established firms (i.e., with prehistory) vs. de novo firms (i.e., without prehistory).

This definition of organizational prehistory is distinct from the ‘prehistory’ the entrepreneurship literature has investigated for de novo firms (e.g., Higgins, 2005; Burton and Beckman, 2007; Beckman and Burton, 2008). This parallel literature has studied differences among de novo firms rooted in their background, whether in terms of imprinting (i.e., differences stemming from decisions made by founders) or human capital (i.e., differences stemming from having people with different levels of expertise). However, firms in all groups, whether incumbent, diversifying, or de novo, experience imprinting and employ individuals with prior expertise. Therefore, although this type of prehistory has been used to explain differences among firms within the de novo group, it cannot explain differences across groups unless an additional mechanism justifies why, for example, better human capital would be housed in one group vs. the other. Lack of evidence of such a mechanism leaves the entrepreneurship literature out of the scope of creative destruction research, despite its implications for future work. In particular, studies of spin-off generation and survival (Klepper and Sleeper, 2005; Klepper, 2007) have implications because those spin-offs with assets from their parent companies have the same kind of organizational prehistory as diversifying entrants, albeit with the structure of de novo firms.

My definition of incumbency is in line with the creative destruction literature (e.g., Henderson, 1993), and in fact parallels that of ‘incumbent’
candidate in the political science literature (e.g., Erikson, 1971):

**DEFINITION 2:** *Market incumbency* refers to the presence of a firm in a focal market at a time precisely prior to the start of a discontinuity. Market incumbency is therefore the relative position of a firm with respect to a specific market and to a specific discontinuity. When measured as a binary variable, market incumbency translates into the dichotomy of incumbents (i.e., with market incumbency) and entrants (i.e., without market incumbency).

**An illustrative empirical case**

To illustrate the operationalization of the constructs of market incumbency and organizational prehistory, I use Wernerfelt’s (1984: 176) resource-product matrix to explicitly keep track of the correspondence of capabilities to markets. I trace the alignment and reuse of firms’ capabilities in keeping with the two mechanisms described as turning prehistory into the disadvantage of inertia, namely misalignment and competency traps.

I use the transition into biotechnology of the longstanding anticancer drug market so that I can later compare a second case that makes the contrast of incumbent vs. entrant and *de alio* vs. *de novo* studies clear: the birth of the AIDS-treatment drug market. The market for AIDS-treatment drugs was born during the biotechnology revolution with the launch of Retrovir® in 1987 (Ashburn and Thor, 2004). Awareness of the disease did not exist prior to 1982 (Centers for Disease Control and Prevention, 2006), and so this is an unambiguously new market because no demand and thus no market existed before the discontinuity of biotechnology. In contrast, the birth of the computer market, for example, is ambiguous because it took place by absorbing demand from the standing markets for typewriters, calculators, and tabulating machines (Cortada, 2000). Data in this section is based on 45 interviews and data collated from historical sources, Pharmaprojects, and the Physicians’ Desk Reference 1947–2005.

Figure 1 shows Wernerfelt’s (1984) resource-product matrix in 1980 (a year preceding the example in Figure 2). I include in the matrix the markets for beer, anticancer drugs, and artificial insulin, chosen because they represent the origins of the main established firms competing in the time frame in Figure 2, which I will use to describe entry. I depict three capabilities that in 1980 added value in some of these markets but not in others. For example, knowledge of chemical synthesis added value in the anticancer drug and artificial insulin markets but added no value in the production of beer.

In Figure 2, I add a time dimension to Wernerfelt’s (1984) matrix to illustrate discontinuities.

In the year 1983, the first drug influenced by biotechnology reached the anticancer drug market and therefore represents the start of the discontinuity in this market. Figure 2 starts then one year before, in 1982, when recombinant DNA (rDNA) technology has become a value-adding capability in the artificial insulin market thanks to the approval of the drug Humulin® 3, a biotech-based substitute for the animal-based form of artificial

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3 Sourced from http://www.lilly.com/about/history/ (1 July 2010).
Figure 2. The dynamics of market entry and incumbency through a technological discontinuity

insulin that constituted this market’s previous supply. Therefore, Figure 2 shows an additional row for rDNA technology with a mark at its intersection with the market for artificial insulin. By 1982, due to rDNA technology use, large-scale fermentation technology also adds value in the market for artificial insulin; thus, there is now a mark at that intersection as well.

Panel 2 in Figure 2 represents a point in time during the discontinuity. For simplicity, I exemplify panel 2 in year 2002. In this year, research on gene therapy, a capability I will use to illustrate entry patterns, is already underway although not officially adding value in any market (hence in light font) (Pearson, Jia, and Kandachi, 2004). Knowledge of chemical synthesis is in light font because this is a capability being replaced.4

Ultimately, Figure 2 presents several paths into competition in the anticancer drug market (central column) during the discontinuity (second panel). One path is to come from the previous technological regime (first panel) of the same market (column) and renew capabilities (rows) for this purpose. These firms are the incumbents in the creative destruction literature and follow path (a) in Figure 2. An example is the firm GlaxoSmithKline (GSK), with its long history of anticancer drug launches dating back to 1953. Another entry path is to be founded during the discontinuity, with no prehistory at the organizational level. These firms are de novo and follow path (d). An example is the firm Targeted Genetics, established in 1989 with the intention of developing anticancer drugs based on gene therapy. There are other paths of entry. Path (b) is one example, where a firm such as Novo Nordisk, which had previously operated in the market for artificial insulin, decides to expand into anticancer drug development reusing knowledge of rDNA technology. Another is path (c), where a firm such as Kirin Corporation, which had previously operated in the market for beer, also decides to move into anticancer drug discovery, reusing knowledge of large-scale fermentation technology. Firms in paths (b) and (c) are not market incumbents because they do not come to the new technological regime (panel 2) from the same market (same column) in the prior regime (panel 1). Nonetheless, they have an organizational prehistory because they were previously in operation (in panel 1).

Figure 2 makes clear that both incumbents and diversifying entrants have a prehistory because they both carry over capabilities acquired at the time of panel 1 to competition in panel 2. And the accumulated capabilities that they can now reuse (in panel 2) for competitive advantage can also be the source of the disadvantages of capability misalignment and competency traps. For example, GSK as an incumbent might try to reuse the same specifications of pharmacokinetics it used in chemistry-based drug discovery for biotech-based drug discovery. Because new specifications should

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4 The two major producers of artificial insulin for the U.S. market, Novo Nordisk and Eli Lilly, stopped supplying their main animal-based brands in 1994 and 1998, respectively, to focus on biotech-based insulin (Swiatek, 2000).
be considered, the reuse of old ones would constitute a competency trap for GSK. Likewise, the diversifying entrant Kirin Corporation might try to reuse the knowledge of bacteria-based fermentation that added value in fermenting beer, the firm’s original business. If bacteria-based fermentation is not useful in biotech-based anticancer drug discovery and instead mammalian cell-based fermentation should be considered, then the reuse of bacteria-based fermentation is a competency trap for the diversifying firm. Indeed, the cognitive biases that underlie the emergence of competency traps in organizations are a consequence of prehistory, not incumbency (for a comprehensive review, see Bazerman and Moore, 2008). If both groups’ prehistories can turn into a disadvantage, an alternative explanation is needed for resulting differences in R&D performance.

**IMPLICATIONS**

**Masking alternative explanations**

If both low performing incumbents and high performing diversifying entrants have a prehistory, their differences in R&D performance must be explained through alternative, more nuanced explanations.

The most straightforward alternative explanation is linked to the dynamics that turn prehistory into inertia. If differences in the prehistory of incumbents and diversifying entrants led to differences in the inertia the firms faced (through differing levels of capability misalignment and/or competency traps), then differences in R&D performance would be an appropriate theoretical prediction. In fact, analysis of the entrants in Henderson and Clark’s (1990) classic study shows that they were diversifying firms, and hence their study was the first to document that differences in prehistory between incumbents and diversifying entrants led to differences in their R&D the firms faced (through differing levels of capability misalignment and/or competency traps), then differences in R&D performance would be an appropriate theoretical prediction. In fact, analysis of the entrants in Henderson and Clark’s (1990) classic study shows that they were diversifying firms, and hence their study was the first to document that differences in prehistory between incumbents and diversifying entrants led to differences in their R&D performance. In their study, only incumbent firms had a prehistory in the prior architecture of the product. Because changes in the capabilities tied to the architecture of a product are more difficult to recognize, the type of prehistory that incumbents had, made them more prone to competency traps than diversifying entrants. Recent work has documented other sources of differences in the prehistory of incumbents and diversifying entrants that result in different levels of inertia. Sosa (2009) located differences in prehistory in underlying differences in the market specificity of the R&D capabilities, whereas Eggers (2012) located them in the breadth of those capabilities and Sosa (2011) located them in the capabilities’ evolutionary path. Although this line of inquiry is in its early stages, it can be expressed in the following proposition:

Proposition 1: In a discontinuity, the group of established firms, whether incumbents or diversifying entrants, whose type of prehistory leads to a higher degree of inertia (either due to a larger proportion of misaligned capabilities and/or more frequent competency traps) will underperform the other group in the R&D of new products, all other things being equal.

A second alternative explanation is a selection process in which incumbents might find themselves forced to compete in their disrupted market. To see the effect of this selection process more clearly, consider first the case where both incumbents and diversifying entrants are single-business firms. Incumbents are faced with two options: continue in this market and face the discontinuity or move to another market where their capabilities are still relevant. In contrast, diversifying entrants are faced with two different options: enter the disrupted market if the endeavor is promising or continue business as usual. Those incumbents that select to compete can be of lower average ability than those diversifying entrants that engage in competition. The performance of incumbents would be lower than that of diversifying entrants due to selection (i.e., incumbents having no other alternatives) instead of the effect of inertia (i.e., incumbents experiencing more misalignment and/or competency traps as they compete).

The abovementioned pattern considers both firms as single-business entities. In reality, they could both be multibusiness enterprises. Incumbents would now face not two but three options where the additional alternative is to exit the market under disruption and operate in the remaining business units. Diversifying entrants’ options would remain the same. The third option now available to incumbents would put them in more equally balanced competitive conditions, in some cases even erasing the selection effect. This is why King and Tucci (1999) argued for the advantages of holding a diversified portfolio of business units.
as a protection mechanism for firms likely to face discontinuities (see also Wu, forthcoming). More broadly, this is the rationale behind the proposition to analyze questions of both business unit strategy and corporate strategy when considering the threats and opportunities that industry evolution poses for a firm (see McGahan, 2004, chapters 6 and 7).5

The selection process can be summarized in two propositions for future research:

**Proposition 2:** In discontinuities where incumbents and diversifying entrants are both single-business firms, the average R&D performance of incumbents will be lower than that of diversifying entrants, all other things being equal.

**Proposition 3:** In discontinuities where incumbents and diversifying entrants are both multi-business firms, the group of firms having better business options outside of the disrupted market under study will have higher R&D performance in that market, all other things being equal.

**Comparing incumbent vs. entrant and de alio vs. de novo studies**

Decoupling incumbency from prehistory brings attention to the comparison between incumbent vs. entrant and de alio vs. de novo studies (e.g., Carroll et al., 1996; Klepper and Simons, 2000).

*De alio* vs. *de novo* studies examine markets that can be observed from birth. In these studies, all firms are entrants, and those firms that are not *de novo* are diversifying firms. In these studies, as *de novo* firms’ sole counterpart, diversifying firms are appropriately termed ‘*de alio*’ firms.

In contrast, the usual design of incumbent vs. entrant studies centers on the disruption of an existing market where some firms are incumbents and are identified based on information regarding the previous technological regime. Firms that are entrants can be *de novo* or diversifying firms though the latter are no longer the sole counterparts of *de novo* firms because there are also incumbents in the sample. The term diversifying entrants is thus more informative and is consistent with the resource-based view of the firm (e.g., Yip’s, 1982 diversification study uses the presence of incumbents as a control variable).

To see the empirical contrast between incumbent vs. entrant and *de alio* vs. *de novo* studies, compare two discontinuities. When the discontinuity brought about by biotechnology disrupted the anticancer drug market, there were firms already in operation in that market that could transition into the new technological regime. Those firms were incumbents. In contrast, when the AIDS-treatment drug market was born, there were no incumbents because there was no previous state of the market. The research design in the AIDS-treatment drug market is comparable to that in studies of the birth of the market for automobiles (Carroll et al., 1996), of the market for television sets (Klepper and Simons, 2000), and of seven new markets within the diagnostic equipment industry (Mitchell, 1994; see also Methé, Swaminathan, and Mitchell, 1996, Table 1; for a full review, see Ganco and Agarwal, 2009).

Comparing incumbent vs. entrant and *de alio* vs. *de novo* studies also has implications for identifying areas for future research. *De alio* vs. *de novo* studies have shown that diversifying entrants tend to outperform *de novo* firms. Incumbent vs. entrant studies have shown that diversifying entrants tend to outperform incumbents. However, there is no evidence for the superior performance of *de novo* firms over incumbents. This point is crucial given that the proposed solution for incumbents’ low R&D performance is for them to imitate some of the characteristics of a *de novo* firm (e.g., Kanter et al., 1991). Future research could test the comparison of incumbent vs. *de novo* firms, opening a new line of inquiry.

**CONCLUSION: IMPROVING RESEARCH DESIGN IN CREATIVE DESTRUCTION STUDIES**

Decoupling incumbency from prehistory can lead scholars to research designs that better identify the determinants of differences in R&D performance across groups of firms. Starting with a clear distinction of diversifying firms among entrants, researchers should analyze whether the prehistories of incumbent and diversifying firms can lead to different levels of inertia. Because prehistory gives rise to inertia only through two mechanisms,
researchers should focus on two key questions: (1) whether the number of capabilities misaligned is significantly different between the two groups of firms, and (2) whether a characteristic(s) of the capabilities in their prehistories makes one group more prone to competency traps. If either group is at a disadvantage, researchers should adapt performance predictions accordingly. Lastly, researchers should examine differences in outside options for incumbent and diversifying firms, focusing on two key issues: (1) the redeployment of firms’ capabilities in another market(s), and (2) the operation of the firm based on business units other than that facing the discontinuity. If outside options differ, then statistical analyses should include control variables to account for these differences (e.g., a variable tracking differences in the profitability of business units other than the one facing the disruption). Doing so would reveal what proportion of the difference in R&D performance is due to differences in selection processes and what proportion is due to differences in the inertia these groups of firms experience.

Appropriate strategic recommendations can then be made in each case: in the case of selection processes, the conclusion should be that a diversified portfolio can serve as insurance against the detrimental effect of discontinuities on the corporation; in the case of differences in inertia, the conclusion should be to search for an organizational design that expedites the acquisition of new capabilities and mitigates the occurrence of competency traps. Only in settings where there are no differences in either prehistory or selection processes can researchers proceed with two instead of three groups of firms. Grouping, however, should show incumbents and diversifying entrants together as established firms. The comparison of established vs. de novo firms will then automatically be aligned with basic theories of change.

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