Explaining Organic Growth Performance:

Why Dynamic Capabilities Need Strategy Guidance

by

George S. Day

The Wharton School, University of Pennsylvania

Why are some firms consistently able to grow faster than their rivals in the same industry? We employ dynamic capabilities theory to show that organic growth leaders excel because they have innovation prowess. Their prowess is gained by combining discipline in their growth-seeking activities with an organizational ability to innovate. Empirical indicators of these constructs were assessed by a sample of senior leaders in 168 companies. We found that innovation ability (comprising the interconnected elements of innovation culture, innovation capabilities and how the firm is organized to enable innovation) explained most of the performance differences between growth leaders, average performers and growth laggards. However, it is the interaction of innovation ability and discipline in pursuing the growth strategy, that explains why growth leaders outperform the average organic growth rate of their industry.

EXPLAINING ORGANIC GROWTH PERFORMANCE:

WHY DYNAMIC CAPABILITIES NEED STRATEGIC GUIDANCE[*]

by

George S. Day

The Wharton School, University of Pennsylvania

Why do some firms achieve organic growth rates that are consistently higher their rivals in the same industry sector? This question has been central to the field of strategy since the inquiry by Edith Penrose (1959) that led to a "theory of the growth of the firm." Her analysis of path dependent firm evolution is considered one of the forerunners of the resource-based view (RBV) of the firm (Lockett and Thompson 2004; Kor and Mahoney 2004, Lockett, Wiklund, Davidson and Girma 2011).

Progress in addressing the organic growth leadership question has been halting. The static and replicable nature of the operational capabilities that populate the RBV (Winter 2003), has encouraged various theories of dynamic capabilities to explain how firms achieve strategic change and growth (Teece et al 1997, Teece 2014, Helfat and Martin 2015). Some of these theories address asset orchestration, adaptation and innovation, while others emphasize the role of managers and teams. These theories have been difficult to address empirically because of the risk of affirming a tautology, where the researcher identifies firms with dynamic capabilities by their success (Williamson 1999, Winter 2003), and more generally as "selecting on the dependent variable." Furthermore, dynamic capabilities are sometimes modeled as direct effects, and elsewhere as preconditions or mediators of firm performance. Additional empirical difficulties have been encountered in the organic growth domain because of the difficulty of disentangling organic growth due to the dynamic capabilities, from

[*] The contribution of Tenko Raykov to the data analysis is gratefully acknowledged. Financial support from the Mack Institute of Innovation Management at the Wharton School is greatly appreciated.

inorganic or acquisition-driven growth. Finding appropriate data has been a persistent problem because of the paucity of longitudinal data, even within a single industry.

Our approach to obtaining a deeper understanding of the contribution of dynamic capabilities to organic growth leadership employs the concept of ***innovation prowess*** (Day 2013). This is an integrative term incorporating the interactive effects of growth-seeking strategic discipline and innovation ability. Innovation ability comes from superior dynamic sub-capabilities (such as mastery of flexible stage-gate development processes or the methods of adaptive experimentation), enabled by an agile organizational configuration and nested within a supportive culture that is committed to innovation. The two basic constructs of discipline and ability and their supporting sub-constructs, are shown to demonstrate the attributes of dynamic capabilities. This theoretical model was tested with survey data from qualified senior innovation executives. We found that innovation ability was the dominant main effect, but it is the interaction of discipline and ability that explains the difference between superior and average organic growth performance.

THEORY DEVELOPMENT

We embed the concept of innovation prowess within dynamic capabilities theory. Most pertinent for our purposes is the distinction between the dynamic capabilities for (1) *sensing and shaping* opportunities and threats (including the "identification, development, co-development of technological opportunities in relationship to customer needs") and, (2) *seizing* opportunities and parrying threats, with the "mobilization of resources to address needs and opportunities, and to capture value from doing so" (Teece 2007, 2014). These dynamic capabilities reside mainly within the capacity of individual managers and the top management. They are given meaning by their choices and commitments (Adner and Helfat, 2003 and Helfat and Martin, 2015). While dynamic capabilities are

distinct from an organization's intentions, motivations and strategy (Teece 2014), their effectiveness depends on the skills of the leadership team (Schoemaker, Leih and Teece 2017), on the clarity of the strategic direction, and the degree to which the organization is aligned with this strategy. This is why we distinguish innovation ability from growth-seeking discipline.

Growth seeking discipline **(D)** and innovation ability **(A)** are higher level constructs that correspond to dynamic capabilities. The empirical indicators of these constructs are the micro-foundations of these capabilities (Foss and Pedersen 2014), since firm level performance emerges from their functioning and interaction. They do not apply to the individual level of the organizational per se, but view them from one level higher. For example, the crucial role of innovation talent is assessed with indicators of the importance placed by leadership on acquiring and retaining this talent. This is a part of the context within which individual level behavior is aggregated and manifested (Barney and Fellin 2013).

Innovation Ability (A)

Advances in the theory of dynamic capabilities have appropriately focused on the nature and function of the higher-level activities that enable a firm to adapt to fast-changing and uncertain future environments. Less attention has been given to the organizational context enabling the requisite non-routine management actions which reflect the ability to carry out the intentions and choices of the growth strategy. As Adner and Helfat (2003) have recognized, dynamic capabilities reside, in part, within the collective abilities of individual managers and the leadership team. But as Teece (2014) also noted, "the organization's values, culture, and collective ability" are integral to the strength or weakness of dynamic capabilities. Here, the capabilities literature converges with theorizing about innovation which highlights the role of culture (including values and behaviors), and the elements of organization structure (such as ambidexterity, governance mechanisms, metrics and incentives). Accordingly, the

construct of innovation ability is hypothesized to comprise three inter-related elements: culture, capabilities and organizational design. These elements are distinct in that each can be readily identified, but we expect a degree of ecological correlation to enable consistency or internal fit, which has been found to correlate positively with performance (Siggelkow 2002).

Culture and Leadership **(A1)** A culture has many levels and facets (Buschgens, Bausch and Balkin 2013). At the deepest level are values that express enduring aspirations, whereas the behaviors of leaders and employees are the most visible outcroppings. We bring together the competing values framework, (Deshpandé et al 1993, and Quinn and Rohrbaugh 1983) with the Tellis (2012) cultural traits, to propose that a culture that nurtures innovation comprises: (1) a belief that failures are opportunities to learn and improve, (2) a willingness to cannibalize successful products (Chandy and Tellis 1998), which requires a recognition that customers will readily migrate to a better solution, (3) a tolerance for the inevitable risk of failure, and (4) a focus on the future.

Slater, Mohr and Sengupta (2014) propose that an adhocracy culture is the best basis for a radical product innovation capability, and also highlight the influence of a proactive customer orientation. Thus, a defining feature of the culture of a growth leader is an emphasis on acquiring and sharing deep insights into the latent and emerging needs of current and prospective customers. This enables them to anticipate market opportunities rather than simply react to customer requests or competitors innovations.

Leadership sets the tone at the top, and shapes the culture by the way they make choices and trade-offs among short versus long-run investments, and how they spend their time. The more time they devote to reviewing projects, working with innovation teams, and recruiting (and retaining) talent the faster their decision making and the stronger the signal to the entire organization of their commitment to growth through innovation. O'Connor (2008) further posits that leadership shapes

the culture through their understanding of the risks of innovation and their vision of the firm's competency objectives.

Innovation Capabilities **(A2)** These dynamic capabilities have a symbiotic relationship with culture: one can't function without the other. Following the innovation literature we posit three sub-capabilities that work together to comprise the overall dynamic capability, and ensure a firm can execute the underlying innovation processes better than its rivals (Bahadir, Bharadovaj and Parzen 2009). Each is essential to executing the disciplined growth-seeking strategy process. Supporting this innovation process are (1) a *market learning* (sub) capability that actively seeks deep market insights, shares them and learns from feedback (Day 1994, Morgan, Slotegraaf and Vorhies 2009). A key indicator is the ability to anticipate customer needs, (2) an *adaptive development* (sub) capability, based on a variant of lean stage-gate or phase-gate product development processes. In effective development processes there is considerable attrition, with each stage serving as a filter. According to one study (Beyer 2005) the firms with superior processes are five times as productive in terms of new product revenues or profits for equivalent investments in R&D and product development spending, and a (3) *continuous experimentation* (sub) capability exemplified by the lean start-up methodologies that have been adopted by many large firms. Experiments are run to test critical assumptions about a concept with a prototype (often called a minimum viable product) before scaling up an innovation (Ries 2011).

Innovation Organization **(A3)** The purpose of an organizational configuration is to align the elements that make up the overall innovation ability, allocate resources effectively, motivate talent to perform to their potential, and ensure accountability for achieving growth. The most influential element is the organizational structure. Many ambidextrous structures have been proposed for managing transformative or adjacent growth initiatives within an established firm (O'Reilly and Tushman 2013). The variants depend on whether organizational ownership of growth initiatives is diffused within the

operating units or whether there is a separate organization and dedicated budget for non core growth opportunities (Wolcott and Lippitz 2010).

The second component of an organizational configuration is the dashboard of metrics plus incentives that are used to motivate the organization by setting targets for improvement, and linking incentives to the achievement of these targets. The configuration also includes the governance structure which comprises the mechanisms used to align goals, prioritize activities, and assign decision-making authority for innovation activities. Many choices have to be made that establish who is accountable, including whether this is entrusted to a single leader or a group, and at what level in the organization.

Growth-Seeking Discipline (D)

Strong dynamic capabilities will have less value if they are tied to a misguided or poorly understood strategy (Teece 2014). This discipline (denoted **D**) is exercised by rigorously searching for and selecting growth opportunities that are congruent with the intent of the growth strategy, and then committing resources to their realization. Pursuing the Growth Strategy (denoted **D1**) and Committing Innovation Resources (denoted **D2**) are considered separate constructs within this higher-level construct. The intention to pursue innovations in the value proposition or business model, will not be realized if the organization is unable or unwilling to provide the necessary financial and human resources.

The growth strategy is a central component of the overall strategy of the business that sets the growth ambition and direction. A useful growth strategy addresses four issues: (1) Growth objectives: how fast does the business want to grow revenues and profits relative to rivals? (2) Scope: how broadly should the business seek growth opportunities from geographic expansion, business model innovations, entering new customer segments, and innovations in the value proposition? (3) Strategic posture: will the business follow an open or closed approach to innovation? Will the business be a first mover, a fast

follower or a niche explorer in mature markets? (4) Allocation of resources: what proportion of the people and financial resources should be allocated to protecting the core business, versus investing in initiatives that are riskier and longer term? The answer to these questions collectively portray the appetite for risk. A superior growth strategy is an internally consistent and coherent set of concepts, policies and choices (Rumelt 2011) that is understood and committed to by the organizations.

Pursuing the growth strategy **(D1)** is a key component of growth seeking discipline. Many lower-level indicators of this construct have been proposed in the literature, including Anthony et al (2008), Christensen and Raynor (2008), Govindarajan and Trimble (2005), Kim and Mamborgne (2005), and Tushman and O'Reilly (1997). Representative indicators of this construct include: whether the strategy is well-articulated and understood throughout the organization, how systematic a process was followed in crafting the strategy and searching for growth opportunities, and the degree of reliance on partners and collaborators (Chesborough 2006, Huston and Sakkab 2006).

The benefits of a systematic, expansive and divergent search for innovation opportunities (versus a reactive response to suggestions and ideas from external and internal sources) have been shown by Lauresen and Saltes (2006). The disciplined use of methods such as lead user analysis (Urban and von Hippel 1988), design thinking (Lockwood 2009) and innovation tournaments (Terwiesch and Ulrich 2009) yield a demonstrably superior set of innovation and growth possibilities. The downside of a divergent search process is that too many attractive opportunities are pursued, with consequent dilution of management effort, loss of focus and delay. The antidote is to follow this divergent search with a rigorous selection discipline that converges on a small set of the best possibilities.

*Committing innovation resources **(D2)**.* This component links the two higher level dynamic capabilities of sensing and then seizing opportunities. It is the commitment of financial and people resources that enables the seizing of opportunities. This is consistent with Noda and Bower (1996) who

treat strategy making as an iterated process of resource allocation, signaling shifting levels of commitment to the pursuit of innovation and new business. Some indicators of this commitment are the perceived sufficiency of these resources in light of the ambition of the objectives, whether urgent short-run demands for development resources absorb or divert resources needed for long-run initiative, whether the resource commitments will be allowed to cause existing technology investments to lose value, and whether investment commitments favor higher-risk, higher return initiatives than the competition. Taken together we have a litmus test for whether the approach to innovation is protective and defensive, versus aggressive and persistent.

Support for the significance of this construct comes from three sources. First, as Ghemawat and del Sol (1998) argue, firms seeking superior growth and returns cannot avoid committing to firm-specific (innovation) resources, because they are hard to imitate and costly to reverse. Second, Klingbiel and Rammer (2014) demonstrate that resource allocation strategies influence the outcomes of innovation project portfolios. They found that breadth of resource allocation across a range of projects matters more than the intensity of resources applied to selected projects, and the level of ambition of innovative intent also mattered. Lastly, de Jong et al (2013) found that a key success factor for innovation was resourcing the portfolio of growth initiatives to win. In particular breakthrough/transformative projects required resourcing to win against current and future competition, and needed the assurance of adequate funding through development to maturity. A consistent theme is that protected resource commitments were essential to the success of projects with long gestation periods.

The role of discipline. The case for discipline in innovation processes and activities was first made by Drucker (1985) and subsequently in Drucker (2002) He argued that most innovative business ideas come from methodically analyzing areas of opportunity that lie within the domain of the business or are derived from trends impacting the business. This meaning of discipline does not impose rigid constraints that might quelch creativity. Instead, healthy discipline channels the creativity and

imagination of the business toward finding and pursuing the best opportunities. The wrong kind of discipline can smother innovation culture, as 3M found when they imposed Six Sigma methodologies on all their innovation processes (Canato, Ravasi and Phillips 2013). The strict discipline of planning, accountability and control collided with deep-seated cultural beliefs such as, "have the patience and persistence to let the fuzzy front-end sharpen." Nonetheless, innovation discipline that is exercised through strategic planning, along with formalization that ensures the coordination of innovation activities, has a significant and positive impact on product innovation success (Song and Chen 2014).

Organic Growth Performance

The persistence of organic growth leadership, or any performance advantage for that matter, has been regularly challenged. This is one aspect of the general issue of whether above average performance is a signal of the strength of current capabilities and the presence of isolating mechanisms and path dependencies, or is a consequence of the firm engaging in risky practices that produce high variability in outcomes (Denrell, Fang and Zhao 2012). There is some evidence that few firms are persistently innovative (Geroski, Van Reenan and Walters 1997) according to their patenting activity, which is arguably some distance from their innovation activities. Notably, Helfat and Winter (2007) draw on evolutionary economics to make a persuasive case for growth persistence, casting doubt in the random walk implications of Gibrat's Law.

The pertinent question for this study is whether a lagging measure of (organic) growth rate leadership is a meaningful indicator of the current or future organic growth rate attributable to the exercise of the current level of innovation prowess. The usual measure is "rate of organic growth relative to competitors in the past 5 years." There are many reasons why superior growth performance is difficult to sustain, which reduces its value as the sole basis of the dependent variable. Penrose (1959) argued that since resources are rate limiting, past growth does not assure future growth because of the

drag from adjustment costs. Other reasons have since been proposed: (1) the "incumbent's curse," whereby success breeds arrogance and complacency, (2) the commitments and priorities of the leadership team change, due to a pressing need for short-term profits and cash flow, and/or a change in ownership following an acquisition, and (3) the continuing risk of new competitors entering, current competitors leap-frogging, or a disruptive change in technology. More generally, because dynamic capabilities are difficult to routinize they are easier to forget (Eisenhardt and Martin 2000), and thus tend to dissipate over time.

In an era of increasingly short-lived advantages, the past organic growth rate is not a sufficient basis for the dependent variable in this study. This means that indicators of present and future commitment to innovation and performance outcomes must be incorporated into the dependent variable (denoted **GROW**). Since the relative importance of these components of the dependent variable of organic growth performance will vary with the rate of change in the industry environment (Tushman and Anderson 1986), we will limit this source of variability by benchmarking the growth rate relative to the other firms in the industry.

RESEARCH METHOD

Many considerations mandated the choice of a survey of pre-qualified senior management respondents in diverse industries and precluded other research designs. It was deemed essential to have a wide representation of industries with different levels of maturity, competitive intensity and growth prospects, to ensure variance in the measures of the key constructs. This is difficult to achieve in single industry studies, even when the cooperation of a significant portion of industry players is obtainable. We opted here for external validity. Specific considerations were:

1. The identification of growth leaders versus average performers requires comparisons with relevant peer competitors. We used relative measures to control and contain variance due to industry differences. Such comparisons are seldom publicly available.
2. Many constructs within the innovation prowess model do not have objective and accessible referents. For example, culture is difficult to assess, and requires knowledgeable insiders who know the relevant behaviors, values and beliefs. This has been a long-standing issue in strategic management research, especially with performance measures like sales growth. Dess and Robinson (1984) found a significant correlation ($r = .69$) of objective and subjective measures of sales growth. They did not separate sales growth by organic means from sales growth gained from mergers and acquisitions. Even presumably objective measures of sales growth have difficulty with this separation because of different accounting treatments of the integration of sales contributed by a recent acquisition.
3. The most appropriate unit of analysis is often the strategic business unit (because they have distinct and separate technologies, markets and competitors). Using company-wide data would obscure important phenomena by averaging across diverse businesses. Relevant data on innovation activities and performance at the SBU level is seldom publicly available.

The choice of a survey design came with some built-in drawbacks, including reliance on subjective measures, the likelihood of response bias and common method effects, and an inability to test hypotheses over extended periods of time. We have attempted to estimate the consequences and minimize their impact on the measures and the statistical tests.

Data Collection

We used a non-systematic sampling approach, to get the benefits from gaining the full cooperation of highly placed and well informed respondents, versus a representative sampling frame

with low response rates. One difficulty in recruiting senior executives who are knowledgeable about the innovation strategies, practices and performance of their firm (or autonomous business unit) is that even if they do agree to participate they will frequently have a subordinate complete the survey. In addition many larger firms have explicit or implicit "no surveys" policies to protect corporate security.

Three different sources were used to recruit respondents. The first source (which yielded 60 percent of all respondents) was a senior executive education program on innovation and strategy. Participants were highly qualified and screened before their responses were accepted. The second source (20 percent of respondents) were participants in invitation-only innovation conferences targeting the C-Suite. The third source of another 20% of respondents were senior leaders of companies that were partners of two major university-based research institutes. Each respondent was recruited separately with strong assurance their responses would be kept secure.

All respondents, regardless of source, were individually prequalified as highly knowledgeable. We used a combination of soft and hard copy (Qualtrics) versions of the survey as appropriate to the recruitment method. As an incentive to participate, respondents were given a chance to benchmark their company scores on all questions compared with growth leaders, laggards and average performers.

Representativeness of the Sample

This survey is susceptible to the risk of non-representative respondents that afflicts all surveys. One reason is that poor performers are less likely to participate in such surveys than other companies. This is not a major problem for this study as the hypotheses concern the strength of relationships and not the absolute levels. Nonetheless, there are estimation problems if the data set is seriously skewed in one direction. To calibrate the degree of bias we were able to compare our responses to the identical questions used in an earlier McKinsey survey of innovation practices (Chan et al 2008) that one of the authors helped design. This survey used the McKinsey Quarterly Panel of 4520 respondents (of which

55 percent were from the C-Suite) and achieved a 26.6 percent response rate. One comparison was with the question at the heart of our dependent variable," Relative to your major competitors what has been the average annual rate of organic growth in the past five years?" As shown in Table One our survey had 41% of respondents saying "higher" or "much higher" (where on an unbiased basis this should have been 33%) By contrast in the McKinsey survey, 44 percent said "higher" or "much higher," and 10.8% said "don't know" compared to 2 percent "don't know" in our survey.

<Insert Table Oe here>

MEASURES

The development and refinement of the measures proceeded in two stages: constructing relevant indicators of each construct, and then estimating the optimal contribution of each indicator to the underlying construct.

Measure Development

A large pool of items was created for each of the five constructs from the pertinent literature, as well as reports by various consulting firms that addressed the innovation effectiveness of firms[1]. The intent was to capture the complexities and nuances of the constructs using language that was familiar to the senior managers who were the respondents. Some were taken directly from other surveys including the above mentioned study of innovation metrics by McKinsey & Co. In effect each item represented an outcropping of a hypothesized reason that a firm could effectively manage innovation in the service of organic growth.

[1] We used the following reports, articles and books as sources for hypotheses based in consultants and practitioners studies of innovation performance: Adolph and Greenwood (2015), Anthony, Johnson, Sinfield and Altman (2008), De Jong, Marston and Roth (2015), Divakaran and Couto (2013), Engel, Dirlea, Dyer and Graf (2015), Fararo, Meer, and Sharina (2012), Jarvzelski, Staack and Goehle (2015) and AD little (2013)

The candidate pool of items was narrowed to the 34 questions about the independent variables that were incorporated in the survey. The distillation began by asking four authorities familiar with the literature and the constructs to sort them appropriately. The instructions were to eliminate redundancies and ambiguities – not every chosen item fit comfortably to a construct so we used a consensus of the judges to drop items. We were acutely aware that having too many items in the survey would curtail the level of cooperation, and were aiming for an instrument that could be completed in less than 15 minutes.

The survey itself had three parts. The introduction asked about the importance of innovation (73% said it was the top priority or one of the top three priorities), innovation spending relative to competitors, innovation and R&D budgeting decisions, and the organic growth rate relative to competitors. The second section converted the 34 items that were chosen to be indicators of the constructs into 7-point Likert (Strongly Agree to Strongly Disagree) scales. Ten of the items were reversed to minimize the biasing halo effects when all items are worded either positively or negatively. The last section began with a battery of ten diagnostic questions, such as "what actions has the company taken to improve innovation performance in the last two years?" and whether these actions made a difference. In conclusion we asked a series of classification questions including type of industry, whether B2B, B2C or both, number of employees and respondent's position in the organization. Since our interest was in the relative performance of discrete businesses we allowed respondents to answer at the business unit level or corporate level, as appropriate to their position.

The final step in the measure development stage was to conduct two pretests of the draft survey with a total of 20 respondents. We looked for questions that elicited too many "don't know" responses and then interviewed the respondents for the purpose of clarifying the questions and eliminating any ambiguity in their wording. This gave us confidence that the survey captured well the key constructs in the study.

Combining the Indicators of Constructs

Because the hypothesized model was highly identified with at least seven to ten indicators or measures for each of the five theoretical constructs, compared to the sample size, we created optimal linear combinations (OLC) of these measures to reduce the number of parameters in our models. OLCs possess both maximal reliability and maximal criterion validity of the initial measures. A substantial data reduction is achieved while ensuring the highest predictive power associated with these models.

An OLC is not a simple sum score of the indicators of each construct, but an optimal sum of these indicators, i.e., a score resulting from the sum of the indicators, after these indicators are first multiplied by optimal weights. The latter are the corresponding ratios of indicator loadings to error variance, for each measure (Raykov 2012). That is, if construct C is measured by the indicators X1, X2, …, Xp, then the weight of X_j in the OLC is the ratio b_j/v_j, where b_j is the loading of X_j on C in the associated single factor model, while v_j is the error variance in X_j:

$$\text{OLC(for construct C)} = b_1/v_1 * X_1 + b_2/v_2 * X_2 + \ldots + b_p/v_p * X_p$$

(e.g., Bartholomew 1996) The primary reason we used OLCs is that each construct indicator or measure only imperfectly captures that construct. There is a part of the variance across respondents on Xj, which is not explained by variance (individual differences) in the underlying construct, but rather by the effect of transitory factors on the observed score that have nothing to do with construct C (e.g., temporary moods or feelings of the respondent and lack of full understanding of the item, which are irrelevant variations of the conditions under which the response is given by the respondent).

Because each X is the sum of the true score and an error score, it cannot be known to what degree the error has biased the obtained results on the observed measures. The OLC is the linear combination of the indicators of a construct that has the highest possible reliability by minimizing the cumulative effect of measurement errors. In addition the criterion validity of the OLC is the highest

possible for any given criterion variable (uncorrelated with the error terms in the observed measures), as shown by Penev and Raykov (2006). The OLC is akin to principal components analysis (PC) but the PC's are only optimal with respect to observed variance (rather than variances and covariances of the observed variables as is the case with OLCs), and thus suffer from suboptimal predictive power.

Dependent Variable (Relative Organic Growth Performance)

We used three measures to reduce our reliance on potentially flawed lagging indicators. Past performance **(PAST)** was measured by asking "Relative to your major competitors what has been the average annual rate of organic growth of the revenues of your organization during the past five years?" The results from this measure were discussed in the previous section. The **(PRESENT)** commitment to innovation and growth was assessed by current spending relative to major competitors, and the **(FUTURE)** prospects were based on the confidence of the management team that organic growth targets for the next three years could be achieved (this FUTURE measure used a 7-point Likert scale). To cope with missing data arising from 2 percent "no answers" to each of the three questions, plus a 9 percent "don't know" response rate for **PRESENT** spending, we assumed the data were missing at random.

The dependent variable **(GROW)** was estimated as an OLC of the three variables. The weights in the OLC were the ratios of the loadings to the residual variances for each variable:

OLC **(GROW)** = 0.771/0.446 **(PAST)** + 0.618/1.157 **(PRESENT)** + 0.537/1.654 **(FUTURE)**

= 1.729 (PAST) + 0.534 **(PRESENT)** + .324 **(FUTURE)**

These weights offer an approximation of the relative contribution of the three measures in the dependent variable, but they are not precise in this respect because of differences in the units of the scale. (Note this will not be an issue when we do a similar analysis of the weights for the independent

variables). Another perspective on the relative weights is given by the R^2 of the observed variables to the OLC **(GROW)** which were: .571 for **PAST**, .248 for **PRESENT** and .148 for **FUTURE**.

The overall message of this comparison of relative weights is that past relative growth is the primary, but not the sole contributor, to the dependent variable. This was expected because there is significant momentum in the innovation system that influences both present relative spending and future growth prospects. Good past performance begets confidence in the future and vice versa.

Independent Variables

In a similar fashion we created OLC's for each of the theoretical constructs from their presumed indicators. The primary contributors to each of the five theoretical constructs are those with the highest weights based on the ratios of loadings to residual variances. The following are the most influential indicators for each construct.

D1 = Pursuing the growth strategy

- We have a well-articulated growth strategy.
- Our growth strategy is well understood throughout the organization.
- The search for growth opportunities is systematic and engages a broad slice of the organization.

D2 = Resource commitments

- Relative to other firms in our industry we tend to favor higher risk, higher return investments.

A1 = Culture and leadership

- Our company culture strongly supports innovation.
- Leadership is continuously involved in reviewing projects and recruiting talent.

A2 = Capabilities

- We have a strong capability for continuous experimentation with new ideas.
- We are well equipped to assess and improve the effectiveness of our innovation activities.

- Our organization invests heavily to develop and retain our talent in innovation activities.

A3 = Organization

- We have an effective organizational structure for innovation.
- My organization's innovation metrics are effectively aligned with individual performance incentives.
- We have a well-defined governance structure to manage innovation in our organization.
- We have clearly defined roles and responsibilities with regard to innovation.

While this summary of the most influential indicators is revealing, we emphasize that it does not provide a complete picture of the construct itself. It is the combination of all indicators that gives full meaning to each construct.

ANALYSIS AND RESULTS

The data were analyzed with robust maximum likelihood methods with auxiliary variables (Enders 2010, Raykov and West 2016), to deal with missing data. To better understand the structure of the data we first examined the correlations of the OLC's for the five theoretical constructs collectively forming **D** and **A**. The correlation results are presented in Table Two. What is noteworthy is that average correlations of the OLC's of the two **D** constructs with the OLC's of the three **A** constructs, have an average R-square index of 0.35. This is explainable by a combination of common methods effects, and the influence of (positive or negative) growth momentum whereby growth leaders demonstrate superiority with both constructs and vice versa. Taking these considerations together we conclude that the measured constructs are related, but are sufficiently non-overlapping to proceed with a multiple regression analysis. To ensure the most robust results were obtained, we combined the three ability constructs into a single measure of ability in order to highlight the interaction.

<Insert Table Two here>

The OLC of **GROW** was estimated as a function of **D1**, **D2, Ability** (OLC) and the interactions of **D1** x **Ability** (OLC) and **D2** x **Ability** OLC. These regression results are shown in the top panel of Table Three. Because the **D2**-by-**Ability** interaction was not significant we dropped it from the model, and reran the analysis. The resulting standardized coefficients are presented in the bottom panel of Table Three. The adjusted R^2 of this model was a respectable 0.353 and highly significant.

There was no discernable direct effect of **D1** on **GROW.** There was a significant independent role for the resource commitment process (**D2**) since the risk appetite of the business, and the adequacy of the resources and their allocation to short term incremental innovation projects versus longer term, transformative projects, is shaped by pressures outside the innovation activities. Without active management this process, which is often implicit and reactive to short-run earnings pressure, diverts financial and human resources towards efforts that bolster current operations, and diminishes the fitness for future growth. A related issue is whether the metrics and analytical approaches for managing and monitoring current business will actually compromise the pursuit of the long-run growth agenda.

<Insert Table Three here>

The interaction of **D1 x A** was significant and highly material to achieving growth leadership. The net effect is that superiority on both **D2** and **A** matters, but what lifts the performance of organic growth leaders above the average is the interaction of **D1** and **Ability**. The direction of effect is likely reciprocal; while superior ability is better guided by an appropriate strategy, the reach and ambition of the growth strategy is more expansive if there is a superior innovation ability to leverage.

No significant contingency factors were expected on theoretical grounds, and none were found. We tested three different contingency variables in the regression model estimated above. The first was type of market served (whether B2B, B2C or both). Separate equations were estimated for each of these three classes, with the type of market coded as a dummy variable. None of the coefficients of the three

dummy variables were significant. Similar results were found by testing various industry classes as contingency dummy variables (for example, financial sector versus all others, high technology versus all others and so forth). The size of firm, as measured by a seven category question about number of employees, was also not significant.

DISCUSSION AND IMPLICATIONS

This study was designed to assess the ability of dynamic capabilities theories to explain differences in the rate of organic growth between firms in the same industry. We hypothesized that the discipline and ability components underlying innovation prowess correspond to the sensing, shaping and seizing dynamic capabilities developed by Teece (2007, 2014). These higher level components of innovation prowess: Growth Seeking Discipline and Innovation Ability, were shown to be dynamic capabilities whose effect on organic growth could only be understood at the micro-foundation level with specific indicators drawn from theory and practice.

In summary the components of innovation prowess were found to be (reasonably) separate constructs that could jointly explain significant variance in our measure of organic growth leadership. We can therefore conclude that the thrust of dynamic capabilities theory was well supported in this study. There is also strong support for the early insight by Penrose (1959), that organic growth (which she called internal growth) is realized through a process of finding productive opportunities and changing and using existing resources to match these opportunities. These overall conclusions are subject to a number of considerations and qualifications. These shed light on the issues of explaining organic growth leadership in particular, and the potential of dynamic capabilities theory to account for superior performance in general.

First, it is safe to conclude that past organic growth leadership does not imply or assure future leadership. There are simply too many countervailing forces and because dynamic capabilities are

difficult to routinize they are also easier to forget than ordinary capabilities. Nonetheless, it is also the case that past organic growth relative to competition can be sustained by current spending on the innovation activities that drive future growth, and nourished by the confidence of the team that growth leadership could be sustained in the future.

Second, we learned conclusively that mastery of the Ability to Innovate (as reflected in the reinforcing elements of culture, capabilities and organizational configuration) is essential to growth leadership, but is not sufficient. The potential of a superior Ability to Innovate is unleased by a superior Growth Seeking Discipline comprising discipline in both pursuing the growth strategy consistently and then committing resources. The only direct effect that mattered was between Ability and the component of the strategic discipline concerning risk appetite and the adequacy of resource commitments. An important theoretical question is whether financial resource commitments are part of the sensing versus the seizing dynamic capabilities, or function as a hybrid capability that bridges the strategic aspirations and choices needed to grow faster, and the ability of the organization to address needs and opportunities, and thereby capture superior economic value. Growth-seeking discipline is exercised through both strategic choices and resource commitments.

Our study highlights several compelling topics in need of further research. First, our findings support previous scholarship on the central role of knowledgeable and committed leadership, and raise specific questions about how it is exercised. Two mechanisms are suggested by the results. One is signaling to the organization at large the innovation priorities and strategic direction through a willingness to expend resources and devote time to innovation activities, and especially to recruiting, nurturing and retaining innovation talent. The second mechanism is through making, honoring and remaking commitments, especially those pertaining to the adequacy and consistency of resource commitments. We use commitments in the sense of actions taken in the present that bind an organization to a future course of action. A second productive area of research concerns the

relationships of the three elements of innovation culture, capabilities and organization structure. It is likely that specific capabilities in the innovation domain are nested and shaped within the context of a culture. Finally, we believe that each organization will chart its own path to innovation prowess, depending on its heritage, resources and circumstances.

Table One

ASSESSING THE REPRESENTATIVENESS

OF THE SURVEY SAMPLE

Question: *Relative to your major competitors, what has been the average annual rate of organic growth of the revenues of your organization during the past five years?*

	McKinsey Global Survey* -October 2008 (n = 1075)	Innovation Prowess Survey – 2015 (n = 168)
Much lower	.03	.03
Lower	.18	.21
About the same	.24	.33
Higher	.38	.30
Much higher	.06	.11
Don't know	.11	.02
	1.00	1.00

*Chan et al (2009)

Table Two

Testing the Model: Correlations of Constructs (r^2)

		D1	D2	A1	A2	A3
Pursuing strategy	**D1**	—				
Committing resources	**S2**	.16	—			
Culture	**A1**	.45	.27	—		
Capabilities	**A2**	.50	.31	.69	—	
Organization	**A3**	.58	.20	.51	.62	—

Table Three

REGRESSION ANALYSIS OF DETERMINANTS OF GROW

(Relative Organic Growth Performance)

I. **Full model** (Unstandardized coefficients)

GROW ON	Estimate	S.E	Estimate/SE	Two-tailed P-Value
D1 (OLC) – Pursuing the Strategy	-0.004	0.023	0.166	0.868
D2 (OLC) – Committing Resources	0.181	0.055	3.279	0.001
A (OLC) – Ability	0.059	0.014	4.173	0.000
D1 x **A**	0.002	0.001	2.432	0.015
D2 x **A**	-0.001	0.003	0.448	0.654

II. ***Partial model without D2 x A*** (Standardized coefficients)

GROW ON				
D1 (OLC)	-0.014	0.088	0.155	0.877
D2 (OLC)	0.246	0.074	3.325	0.001
A (OLC)	0.404	0.090	4.494	0.000
D1 x A	0.137	0.056	2.464	0.014
R^2	0.353	0.053	6.701	0.000

REFERENCES

Adner, R. and C. E. Helfat. 2003. "Corporate effects and dynamic managerial capabilities," *Strategic Management Journal*, 24 (10), 1011-1025.

Adolph, G. and K. D. Greenwood. 2015. "Grow from Your Strengths," *Strategy + Business*, 4.

Aggarwal, V., N. Siggelkow, and H. Singh. 2011. "Corporate Development Choices and Interdependence: Strategic Tradeoffs and Performance Implications, *Strategic Management Journal*, 32: 705-730.

Anthony, S. D., M. W. Johnson, J. V. Sinfield, and E. J. Altman. 2008. *The Innovator's Guide to Growth*, Harvard Business School Press: Cambridge MA

Bahadir, S. C., S. Bharadwaj, and P. Parzen. 2009. "A meta-analysis of the determinants of organic sales growth," *International Journal of Research in Marketing*, 26, 263-275.

Barney, J. and T. Felin. 2013. "What Are Microfoundations?" *The Academy of Management Perspectives*, 27 (2), 138-155.

Bartholomew, D.J. 1996. *The Statistical Approach to Social Measurement.* Academic Press, New York.

Beyor, G. 2005. Innovation Excellence: How Firms Use Innovation to improve Profitability and Growth," Arthur D. Little Inc: Boston.

Bingham, C.B., N. R. Furr, and K. M. Eisenhardt. 2014. "The Opportunity Paradox," *MIT Sloan Management Review*, 29-35.

Buschgens, T., A. Bausch, and D. B. Balkin. 2013. "Organizational Culture and Innovation: A Meta-Analytic Review," *Journal of Product Innovation Management*, 30 (4), 763-781.

Canato, A., D. Ravasi, and N. Phillips. 2013. "Coerced Practice Implementation in Cases of Low Cultural Fit: Cultural Change and Practice Adaptation During the Implementation of Six Sigma at 3M," *Academy of Management Journal*, 56 (6), 1724-1753.

Chan, V., C. Musso, and V. Shankan. 2008. "Assessing Innovation Metrics," *McKinsey Quarterly*, December, 1-10.

Chandy, R. K. and G. R. Tellis. 1998. "Organizing for Radical Product Innovation: The Overlooked Role of Willingness to Cannibalize," 35 (November), 474-87.

Chesbrough, H. 2006. *Open Business Models: How to Thrive in the New Innovation Landscape*, Harvard Business School Press: Boston, MA.

Christensen, C. M. and M. Raynor. 2008. *The Innovator's Solution: Creating and Sustaining Successful Growth*, Harvard Business School Press: Boston, MA.

Day, G. S. 2013. Innovation Prowess, Philadelphia, Wharton Digital Press

Day, G. S. 1994. “The Capabilities of Market-Driven Organizations,” *Journal of Marketing*, 58 (4), 37-51.

Day, G. S. 2007. “Is it Real? Can we Win? Is It Worth It?” *Harvard Business Review*, December, 127-133.

Day, G. S. and P. J. H. Schoemaker. 2016. “Adapting to Fast-Changing Markets and Technologies,” *California Management Review,* 58 (4), Summer, 59-77.

De Jong, M., M. Marston, and E. Roth. 2015. “The Eight Essentials of Innovation,” *McKinsey Quarterly*, April.

Derrell, J., C. Fang, and Z. Zhao. 2012. “Inferring Superior Capabilities from Sustained Superior Performance: A Bayesian Analysis,” *Strategic Management Journal*, 34 (2) 182-196.

Deshpendé, R., J. Farley, and F. Webster. 1993. “Corporate Culture, Customer Orientation and Innovativeness in Japanese Firms,” *Journal of Marketing*, 57 (1) 23-37.

Dess, G. G. and R. G. Robinson Jr. 1984. “Measuring Organizational Performance in the Absence of Objective Measures: The Case of the Privately-Held Firm and Conglomerate Business Unit,” *Strategic Management Journal*, 5 (3), 265-273.

Divakaran, A. and V. Couto. 2013. “How Ready are You for Growth?” *Strategy & Leadership*, 69-77.

Drucker, P. F. 1985, *Innovation and Entrepreneurshi*p, Harper and Row, New York.

Drucker, P. F. 2002. “The Discipline of Innovation,” *Harvard Business Review*, Reprint R0208F

Eisenhardt, K. M. and J. A. Martin. 2000. “Dynamic Capabilities: What Are They?” *Strategic Management Journal*, 21 (10-11), 1105-1121.

Enders, C. K. 2010. *Applied Missing Data Analysis, Guilford Press*, New York.

Engel K., V. Dirlea, S. Dyer, and D. Graff. 2015. “How to Build the Permanently Innovative Company: Five Tested Sets of Management Practices,” *Strategy* + *Business*, 2.

Favaro, K., D. Meer and S. Sharina. 2012. “Creating an Organic Growth Machine,” *Harvard Business Review*, 90 (6), 96-106.

Foss, N. J. and T. Pederson. 2014. “Microfoundations in Strategy Research,” *Strategic Management Journal*, December 12

Geroski, P. A. 2005. “Understanding the Implications of Empirical Work on Corporate Growth Rates,” *Managerial and Decision Economics*, 26, 129-138.

Geroski, P. A., P. Van Reenan, and C. F. Walters. 1997. “How Persistently do Firms Innovate?” *Research Policy*, 26, 33-48.

Ghemawat, P. and P. del Sol. 1998. "Commitment versus Flexibility?" *California Management Review*, 40 (4), 26-42.

Govindarajan, V. and C. Trimble. 2005. *Ten Rules for Strategic Innovators: From Idea to Execution,* Harvard Business Press: Boston, MA.

Gruber, M., F. Heineman, M. Breitel, and Hungeling. 2010. "Configurations of Resources and Capabilities and Their Performance Implications: An Exploratory Study on Technology Ventures," *Strategic Management Journal*, 31: 1337-1356.

Gulati, R. and P. Puranam. 2009. "Renewal Through Reorganization: The Value of Inconsistencies Between Formal and Informal Organizations," *Organization Science*, 20 (2): 422-440.

Helfat, C. E. and J. A. Martin. 2015. "Dynamic Managerial Capabilities: Review and Assessment of Managerial Impact on Strategic Change," *Journal of Management*, 41 (5) 1281-1312.

Helfat, C. E., S. G. Winter. 2007. "Firm Growth and Dynamic Capabilities," Chapter Seven, Helfat et al, *Dynamic Capabilities: Understanding Strategy Change in Organizations*, Oxford UK, Blackwell.

Hess, E. D. 2010. *Smart Growth*: *Building an Enduring Business by Managing the Risks of Growth*, Columbia Business School Publishing: New York.

Huston, L. and Sakkab N. 2006. "*Connect and Develop: Inside Proctor & Gamble's New Model for Innovation*," Harvard Business Review, 58-66.

Jaruzelski, B., V. Staack, and B. Goehle. 2015, "Proven Paths to Innovation," *Strategy + Business,* 3.

Kim, C. W. and R. Mauborgne. 2005. *Blue Ocean Strategy*, Harvard Business School Press: Boston, MA.

Kirsner, S. 2015. "What Big Companies Get Wrong About Innovation Metrics," *Harvard Business Review*, May: 17-20.

Klingbiel, R. and C. Rammer. 2014. "Resource Allocation Strategy for Innovation Portfolio Management," *Strategic Management Journal*, 35, 246-268.

Kur, Y. Y. and J. T. Mahoney. 2004. "Edith Penrose's (1959) Contributions to the Resource-based view of Strategic Management," *Journal of Management Studies*, 41 (January) 183-191.

Laureson, A. and A. Saltes. 2006. "Open for Innovation: The role of openness in explaining innovation performance among UK manufacturing firms," *Strategic Management Journal*, 27 (2): 131-150.

Little, A. D. 2013. *Getting a Better Return on Your Innovation Investment,* Results of the 6th Arthur D Little Global Innovation Excellence Study.

Lockett, A. and S. Thompson. 2004. "Edith Penrose's Contributions to the Resource-based View: An Alternative Perspective," *Journal of Management Studies*, 41 (January) 193-203.

Lockwood, T. 2009. *Design Thinking: Integrating Innovation, Customer Experience and Brand Value*, Design Management Institute, New York NY.

Madsen, T. L. and M. J. Leiblein. 2015. “What Factors Affect the Persistence of an Innovation Advantage?” *Journal of Management Studies*, 52 (8), 1097-1127.

Morgan, N. A., R. J. Slotegraaf, and D. W. Vorhies. 2009. “Linking Marketing Capabilities with Profit Growth, *International Journal of Research* in Marketing, 26, 284-293.

Morgan, N. A., D. W. Vorhies, and C. H. Mason. 2009. “Market Orientation, Marketing Capabilities and Firm Performance,” *Strategic Management Journal*, 30 (8), 909-920.

Noda, T. and Bower, J. L. 1996. “Strategy Making as Iterated Processes of Resource Allocations,” *Strategic Management Journal*, 17, 159-192.

O’Conner, G. C. 2008. “Major Innovation as a Dynamic Capability: A Systems Approach,” *Journal of Product Innovation Management*, 25, 313-330.

O’Reilly, C. A. and M. Tushman. 2013. “Organizational Ambidexterity: Past, Present and Future,” *Academy of Management Perspectives,* 27 (November).

O’Reilly III, C. A. and M. L. Tushman. 2008. “Ambidexterity as a Dynamic Capability: Resolving the Innovators Dilemma,” *Research on Organizational Behavior*, 28 (1): 185-206.

Passmore, W. and R. Stilwell. 2013. *HR’s Contribution to Creativity and Innovation*, CRF Research: London, UK.

Penev, S. and T. Raykov. 2006. “On the relationship between maximal reliability and criterion validiy.” *Multivariate behavioral Research,* 42.

Penrose, E. T. 1959. *The Theory of the Growth of the Firm,* Blackwell, Oxford.

Quinn, R. and J. Rohrbaugh. 1983. “A special model of effectiveness criteria: Towards a competing values approach to organizational analysis,” *Management Science*, 29 (3), 363-77.

Raykov, T. 2012. “Scale construction and development using latent variable modeling.” In R. Hoyle (Ed.), *Handbook of Structural Equation Modeling*. Guilford Press, New York, 472-498.

Raykov, T. and B. T. West. 2016. “On Enhancing Plausibility of the Missing at Random Assumption in Incomplete Data Analyses Via Evaluation of Response-Auxiliary Variable Correlations,” *Structural Equation Modeling*, 23, 43-53.

Reitzig, M. 2011. “Is Your Company Choosing the Best Innovation Ideas?” *MIT Sloan Management Review* (Summer), 47-52.

Ries, E. 2011. *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*, Crown Business: New York

Rumelt, R. P. 2011. *Good Strategy, Bad Strategy: The Difference and Why It Matters*, Crown Business, New York.

Schoemaker, PJH, S. Leih and D.J. Teece. 2017. “Innovation, Dynamic Capabilities and Leadership,” *California Management Review*, forthcoming.

Schrage, M. 2014. *The Innovator’s Hypothesis: How Cheap Experiments are Worth More than Good Ideas*, The MIT Press: Cambridge, MA.

Siqqelkow, N. 2002. “Evolution toward fit,” *Administration Science Quarterly*, 47: 125-159.

Slater, S. F., J. J. Mohr, and S. Sengupta. 2014. “Radical Product Innovation Capability: Literature Review, Synthesis and Illustrative Research Propositions,” *Journal of Product Innovation Management*, 31 (3), 552.566.

Song, M. and Y. Chen. 2014. “Organizational Attributes, Market Growth, and Product Innovation,” *Journal of Product Innovation Management*, 31 (6), 1312, 1329.

Teece, D. J. 2007. “Explicating Dynamic Capabilities: The Nature and Micro-foundations of (Sustainable) Enterprises Performance,” *Strategic Management Journal*, 28(13), 1319-50.

Teece, D. J. 2014. “The Foundations of Enterprise Performance: Dynamic and Ordinary Capabilities in an (Economic) Theory of Firms,” *The Academy of Management Perspectives*, 28(4), 328-352.

Teece, D. J., G. Pisano, and A. Shuen. 1997. “Dynamic Capabilities and Strategic Management,” *Strategic Management Journal*.

Tellis, G. 2013. *Unrelenting Innovation: How to Build a Culture for Market Dominance,* Jossey-Bass: San Francisco, CA

Terwiesch, C. and K. T. Ulrich. 2009. *Innovation Tournaments: Creating and Selecting Exceptional Opportunities*, Harvard Business Press, Boston.

Tushman, M. L. and P. Anderson. 1986. “Technological Discontuwork and Organizational Environments,” *Administrative Science Quarterly*, 31 (3), 439-465.

Tushman, M. L. and O’Reilly, C. A. 1997. *Winning Through Innovation: A Pactical Guide to Leading Organizational Change and Renewal*, Harvard Business School Press: Boston, MA.

Urban, G. L. and E. von Hippel. 1988. “Lead User Analyses for the Development of New Industrial Products,” *Management Science*, 34 (5), 569-582.

Weinzimmer, L. G., P. C. Nystrom, and S. J. Freeman. 1998. “Measuring Organizational Growth: Issues, Consequences and Guidelines.” *Journal of Management*, 24 (2), 235-262.

Williamson, O. E. 1999. “Strategy Research: Governance and Competences Perspectives,” *Strategic Management Journal*, 20 (12), 1082-1108.

Winter, S. G. 2003. “Understanding Dynamic Capabilities,” *Strategic Management Journal*, 24 (10) 991-5.

Wolcott, R. J. and M. Lippit. 2010. *Grow from within: Mastering Corporate Entrepreneurship and Innovation*, McGraw-Hill: New York.