UNPACKING THE ANTECEDENTS OF EFFECTUATION AND CAUSATION IN A CORPORATE CONTEXT

Anette Johansson
Jönköping International Business School, anette.johansson@jibs.hj.se

Alexander McKelvie
Syracuse University

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UNPACKING THE ANTECEDENTS OF EFFECTUATION AND CAUSATION IN A CORPORATE CONTEXT

Anette Johansson, Jönköping International Business School, Sweden
Alexander McKelvie, Syracuse University, USA

ABSTRACT

Effectuation and causation are important modes of entrepreneurial decision-making. In this paper, we extend the literature on effectuation into the corporate context. Based on extant theory concerning both individual decision-makers’ human capital and organizational-level characteristics, we develop and test hypotheses concerning the use of effectuation and causation in pursuing new opportunities in the magazine industry. Our results, based on the actions of 246 key decision-makers, show an inconsistent set of antecedents for causation and the four effectual logic principles. As such, our multi-level study helps to unravel some of the complexities of the choice of decision-making logics.

INTRODUCTION

There is a growing stream of literature that addresses how entrepreneurs make decisions in the face of uncertainty (Read, Dew, Sarasvathy, Song, & Wiltbank, 2009; Wiltbank, Read, Dew, Sarasvathy, 2009; McKelvie, Haynie & Gustavsson, 2011). Much of this work has adopted a lens of effectuation (Sarasvathy, 2001). Empirical research has shown that effectuation is the most commonly espoused logic employed by expert entrepreneurs (Dew et al., 2009) and when levels of uncertainty are high (Chandler, De Tienne, McKelvie & Mumford, 2011). Yet, we know little more about when and under what conditions entrepreneurs prefer effectual over causal logic. Further, the majority of insights into this area have focused on entrepreneurial activity in the context of new start-up ventures. Although the idea of extending effectuation research as a decision-making mode in the context of established business has been proposed in the literature (e.g. Wiltbank, Read, Dew & Sarasvathy, 2006), very limited research has been done in this area. One recent study (Brettel, Mauer, Engelen, & Küpper, 2011) offers an initial extension of effectuation research into the corporate context and demonstrates that effectual principles are employed by key decision-makers in corporate contexts, but the focus of their work is primarily on the performance outcomes in corporate R&D projects. We therefore still know relatively little about when and why effectuation and/or causation processes are employed in corporate decisions, despite the importance of entrepreneurial action for the sustained performance of startups and corporations alike.

In this paper, we extend the effectuation literature by examining the role of human capital of individual decision-makers and the organizational environment for the use of effectual or causal logics in the pursuit of new opportunities in a corporate context. This is an important contribution to the literature because in doing so, we build upon the extant literature that states that expertise
predicts preference for effectual logic (e.g. Sarasvathy, 2001; Dew et al., 2009) by addressing multiple aspects of the human capital of the decision-maker. In addition, we examine the corporate environment to understand the organizational conditions that might lead to the use of effectual logic. Specifically, we build upon the extant literature to suggest that the entrepreneurial culture (Brown, Davidsson & Wiklund, 2001), and the reputational capital of the firm (Fisher & Reuber, 2007; Hoang & Antoncic, 2003) will help to predict the use of effectual vs. causal logic. These two organizational level factors are important as both are tied to the pursuit of new opportunities – the first offering appropriate organizational conditions from which to develop, the second being a reflection of the firms’ accumulated expertise and identity. Extending the literature in this way responds to calls for greater multi-level studies of decision making exploring the relationships between effectuation and established constructs in the organizational context as well as human capital (Unger, Rauch, Frese, & Rosenbusch, 2011; Brettel et al., 2011; Perry, Chandler & Markova, Forthcoming).

**THEORY AND HYPOTHESIS DEVELOPMENT**

The logic of effectuation challenges traditional approaches to decision making under uncertainty by suggesting a logic which is the invert from the linear, goal-driven and analytic approach taught at most business schools today. This latter approach is referred to by Sarasvathy as a causal logic (2001). An effectual logic instead includes a process where “current means are transformed into co-created goals with others who commit to building a possible future” (Wiltbank et al. 2006, p. 983). Although effectuation research can be considered to be in its infancy, it represents a “paradigmatic shift in the way that we understand entrepreneurship” (Perry et al., Forthcoming). From viewing the entrepreneurial decision process as a deliberate goal-driven process (referred to by Sarasvathy as causal), researchers now have evidence that expert entrepreneurs instead use a means-driven process characterized by such issues as flexibility and collaboration. Additionally, while both causal and effectual logics seek control over the future, causation focuses on the predictable aspects of the future whereas effectuation focuses on the controllable aspects (Sarasvathy, 2008).

Efforts to further explore effectuation include looking at links to performance (Read, Song, & Smit, 2009; Wiltbank et al. 2009); differences between experts and novice entrepreneurs (Read, et al., 2009) and the role of expertise (Gustavsson, 2006). The empirical initiatives have generally been of a qualitative, experimental nature using such methods as verbal protocol analysis (e.g. Sarasvathy’s original study in 1998). Further, they have largely been focused on de novo startup ventures. More recent developments within this stream of research have been through attempts to empirically model and test effectuation and causation in large scale surveys (Brettel, et al., 2011; Chandler et al., 2009). Among these, only the Brettel et al. (2011) study attempts to move effectuation research from the startup setting into the corporate setting, and thereby also testing the idea of effectuation as a general theory of decision making under uncertainty.

Research has shown that effectuation is a latent construct which embodies four core principles: a) **Affordable loss** meaning that rather than setting goals of return on investments entrepreneurs decide what they can afford to lose; b) openness to building **Strategic alliances** by inviting self-selected stakeholders to pre-commit to co-create the project as a way of reducing uncertainty; c) **Exploiting contingencies** meaning embracing unexpected events and using them to reshape the outcome, and finally d) controlling an unpredictable future through action - as opposed to trying
to predict it - through Experimenting with different solutions (Sarasvathy, 2001). In later studies, these sub-dimensions have been clarified further and also re-named (Sarasvathy, 2008). However, the above principles capture the core of effectuation. With the aim to move the effectuation research further, Chandler et al. (2011) tested and validated a scale to measure effectual and causal decision making behavior on a sample of entrepreneurs in young firms. Their study demonstrates that effectuation is a formative, multi-dimensional construct including three of the principles; affordable loss, experimentation and exploiting contingencies (operationalized as flexibility). The fourth principle, pre-commitments, was found to be shared between the effectual and causal logic.

The latter highlights something that is often neglected in the treatment and discussion of the effectuation and causation construct, namely that effectuation and causation are not polar opposites. Rather, they represent different approaches that can be used at different times (Sarasvathy, 2008, Perry et al., Forthcoming). The choice of decision making logic is hence not a matter of a simple binary option, but rather a selection among multiple decision making logics and principals, fluctuating based on such as factors as the human capital of the decision maker (Sarasvathy, 2001) and the organizational environment (Simon, 1997).

**Human Capital as an Antecedent**

One of the foundational pillars of effectuation as a general theory of decision making under uncertainty is expertise (Sarasvathy, 2001). This dates back to Cyert and March (1963) who emphasize that decision making is first and foremost a function of prior experience. There is profound research on the cognitions of experts in general (e.g. Chase & Simon, 1973 and Klein, 1998). Common for this research is that mere intelligence does not explain expertise, but more complex factors need to be considered such as how information is stored, problems are perceived, and solutions generated (Dew et al., 2009), all related to experience. Streams of research examining human capital include several different representations commonly categorized under the knowledge, skills, and abilities (KSAs) in people (Coff, 2002). Experience, education and training are the most commonly adopted concepts (Crook, Todd, Combs, & Woehr, 2011), frequently operationalized as industry and management know-how (Cooper, Gimeno-Gascon, & Woo, 1994). Sarasvathy’s (2001) notion of entrepreneurial expertise relates specifically back to a having founded a substantial number of start-ups, both successful and unsuccessful, and hence refers to the personal experiences rather than the formal education of the entrepreneur. In this study, we adopt a wider variety of human capital measures; industry experience, education, start-up experience and top management experience.

The extant literature confirms that expert entrepreneurs prefer effectual logic more frequently as compared to novices (Dew et al., 2009; Read et al., 2009). This implies that the knowledge and experience acquired through repeated efforts of engaging in entrepreneurial action (i.e. starting a firm) influences the decision making logic over time towards effectual thinking. In extending this research into a corporate setting, the similarity of the experience can be conceived as both industry expertise (in our case the magazine publishing industry) as well as the effort of previous similar efforts (i.e. previous start-up experience). We rely on the definition of expertise used by Dew et al. (2009) as “deep personal ability and knowledge derived from extensive practice and experience based on immersion in the relevant domain”. Hence, in our attempt to further unpack the concept of expertise we suggest the following hypothesis related to the industry experience:
H1a: Greater amounts of industry experience of the individual decision maker will be positively related to the use of effectual logic.

H1b: Greater amounts of industry experience of the individual decision maker will be negatively related to the use of causal logic.

Education is the main ingredient in the theoretical concept of human capital and several influential scholars have studied its influence on individual earnings (Mincer, 1974), economic growth (Griliches, 1997) and social capital passed on to children by their parents (Becker & Tomas, 1994) to mention only a few. Length of education indicates a person's knowledge and is probably one of the greatest influencers on decision making logic. In contrasting analytic strategies with non-analytic decision making strategies (such as rule of thumb and compliance with convention) Beach and Mitchell (1978) conclude that analytic decision making strategies are usually only available through education and that one aspect of higher level education is to learn analytic tools and mechanisms that might help to make better sense of complex issues.

Additionally, the assumption that the collection of information and subsequent analysis are central to higher education in general is widely accepted in management research (Goll & Rasheed, 2005; Huffman, 1974). In a study comparing effectual and causal logics among expert entrepreneurs and MBA students, Dew et al. (2009) found significant differences where MBA students widely preferred the causal logic. They make the assumptions that this is due to the (causal) knowledge structures they have acquired throughout their education. However, they also emphasize that there is no systematic research available examining the link between education curricula and decision making logic. Based on the above discussion, although there appears to be inconclusive scientific evidence, there is reason to believe that level of education may predict the use of causal logic, as the more educated you are, the more will you have learned about “right ways” to approach things, regardless domain. Hence we propose the following hypotheses:

H2a: Higher levels of education of the individual decision maker will be positively related to the use of causal logic.

H2b: Lower levels of education of the individual decision maker will be positively related to the use of effectual logic.

Related to entrepreneurial expertise is of course experience from starting a business. While this was the main issue in the original study by Sarasvathy (1998) the role of start-up experience and small-firm work experience in general is unclear in the setting of established firms. However, previous start-up experience have been proven to predict firm success (Dyke, Fischer & Reuber, 1992) and we therefore hypothesize that is has some impact in as much as the lessons learned from that experience may influence overall human capital. This is particularly true when looking at decisions related to business development issues, as is the case in this study. Hence, we will test the relationship between previous start-up experience and the preferred decision making logic. Resting on the assumption from existing effectuation research where start-up experience is a core part of entrepreneurial expertise (Sarasvathy, 2001) we propose the following hypotheses:

H3a: The decision maker possessing previous experience from having founded a new firm will be positively related to the use of effectual logic.

H3b: The decision maker possessing previous experience from working in a small firm will be positively related to the use of effectual logic.
The responsibilities that come along with a top management position provide constraints as well as freedom, each of which represents demands that reflect the different positions held. Top managers generally need to balance the duality of formal processes induced by issues such as shareholder interests, the need for legitimacy, and more intuitive processes induced by the trust in the decision makers’ experience and judgment while also balancing the drives to be more creative and innovative. As such, there are pressures for top managers to be more thorough and analytic in order to provide support of and risk reduction to other important stakeholders while simultaneously offering the individual impetus for entrepreneurial efforts. As such, this balance constitutes an interesting dilemma when it comes to decision making logic. Hitt and Tyler (1991) found that the normative, rational decision making model dominate among top managers. At the same time though, it is widely known that these models do not always hold in all situations, such as when facing uncertainty or urgency (Kahneman & Tversky, 1974), and that strategy formation in reality has a much more evolving nature than the idea of rationality suggests (Mintzberg & Waters, 1985).

Relying on Sarasvathy’s conceptualization of expertise (2001) would suggest that top managers would use their own experience and individual expertise by engaging in effectual logic. However, the need to provide satisfactory due diligence to stakeholders – institutional pressures, perhaps – would suggest that being in the top management teams would entail that top managers have a higher tendency to employ causation. We therefore propose a set of competing relationships.

**H4a:** Being in a position of top management in the firm will be positively related to the use of effectual logic.

**H4b:** Being in a position of top management in the firm will be positively related to the use of causal logic.

**Organizational Environment**

Assumptions, goals and attitudes held in a firm represent the organizational environment that feeds into the decision making behavior of organizational members (Simon, 1997). This means that in order to understand what lies behind a certain decision making approach, we need to look further into environmental conditions that are likely to have bearing on this. Innovation is inherent in the effectuation construct as it origins from studies on expert entrepreneurs’ decisions when creating new firms, with a particular focus on the dynamic and uncertain context of new venture creation (Sarasvathy, 2001). Moving from the empirical realm of the creation of new ventures to established firms, the equivalent task environment is related to innovation and corporate venturing. Also here has an encouraging environment been found essential (Hornsby, Kuratko, & Zahra, 2002). Dew et al. (2008) suggest that including effectuation in the decision making design in established firms could support the work of established firms to innovate and create new markets. This idea is tested in a study by Brettel et al. (2011) on R&D projects in technology-based organizations, with the results showing that effectuation is positively related with the success of R&D projects in highly innovative contexts. Hence it appears to be a relationship between innovative efforts and the use of effectual logic. In a review of the state of effectuation research, Perry et al. (Forthcoming) highlights the need to study the role of the environment for decision making behavior.
Essential for the organizational environment is also organizational culture, defined by Schein (2004, p. 17) as the “pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems”. The impact of culture on strategic outcomes is widely acknowledged. For example, the strong and somewhat conservative culture of newspaper journalism has been blamed for that sector’s inability to seize the potential of the Internet (Küng 2008). Of particular interest when exploring decision-making approaches related to the pursuit of new opportunities in a dynamic industry, is the presence of an entrepreneurial culture. Promoting flexibility, creativity, continuous innovation and renewal are some of the aspects put forward as important ingredients of an entrepreneurial culture (Ireland, Hitt & Sirmon, 2003, p. 968).

Stevenson and Gumpert (1985) added entrepreneurial culture as one dimension of entrepreneurial management among the overall work on strategic orientations. They define an entrepreneurial culture as one that is driven by opportunity and with a reward philosophy that helps encourage the pursuit of opportunity. Brown et al. (2001) developed a scale to measure Stevenson’s conceptualization of entrepreneurial management that included entrepreneurial culture. Stevenson discusses entrepreneurial management as a distinct mode of management compared to traditional, administrative management (Stevenson & Jarillo, 1990). Research on effectuation and causation shows however that experts as well as novices display both what Stevenson would have called entrepreneurial and administrative behavior (Sarasvathy, 2001, (Read et al., 2009). Yet, we know little about the environmental factors determining and individual’s reliance on either of the two types of logic. Entrepreneurial culture offers an environment characterized by creativity and openness, which constitutes a good breeding ground for effectual logic as opposed to causal logic. Hence, we propose the following hypotheses:

H5: Possessing a higher entrepreneurial culture will be positively related to the use of effectual logic.

Apart from the entrepreneurial culture of the organization, another representation for the organizational environment is the firm’s reputational capital related to innovativeness, field expertise and employer attractiveness. A firm’s reputation is generally considered to be a valuable resource (Amit & Schoemaker, 1993; Barney, 1991). Advantages include being attractive to investors, customers, suppliers and employees (Fischer & Reuber, 2007). The reputational capital of a firm is likely to be connected to the behavior of the organizational members in several ways. To begin with, reputation is enhanced by founders previous merits, high-status partners, and awards and wins in contests (Deutsch & Ross, 2003; Shane & Cable, 2002) – all connected to stakeholder commitments and innovative behavior. In addition, a strong reputation feeds back into the organization by attracting new members who are willing to subscribe to the firm’s culture, and by retaining the employees who were part of shaping that very reputation and as such continue to shape the environment. Based on our reading on effectuation and reputational capital (Fombus, 1996, Sarasvathy, 2001) we rely on the assumption that reputational capital and effectual logic share two important ingredients: 1) the ability to form relationships and 2) the expertise bias, inasmuch as reputational capital is a reflection of the firm’s accumulated expertise and identity, especially in regards to previous experience and success at innovation. Hence, we suggest the following hypotheses:

H6: Firms with greater reputational capital will be positively related to the use of effectual logic.
Method

Sample

We examine the use of effectual and causal logic on a robust sample of 246 key corporate decision-makers in publicly traded Swedish corporations in the magazine industry. The magazine industry is currently in a state of flux, where there is high uncertainty based on industry transformation induced by digital innovations such as the internet, smart phones, and reading devices. As such, it offers an appropriate context to study entrepreneurial decision-making. To ensure that the sample included active, commercial publishers we excluded firms with annual revenue of less than 100,000 SEK, equivalent to approximately US$14,000, and those that did not have any registered full-time employees. This helped to ensure that the sample consisted of firms with actual operations and who would be appropriate to account for their work related to business development. As such, this helps increase the validity of the sample.

We first identified 386 magazine publishers corresponding to the above criteria, based upon a database containing all incorporated firms in Sweden. Incorporating a firm in Sweden has minimal capital requirements (approximately $14,000) and has been connected to more growth-oriented firms (Dahlqvist, Davidsson & Wiklund, 2000). After scrutinizing the list in search of duplicates and inappropriate firms, such as newspaper publishers and advertising agencies, we reduced the population to 243 magazine publishers. Further, since such decisions are not necessarily in the hands of only one individual at the top of the corporate hierarchy (i.e. the CEO), we set out to expand the number of potential respondents by examining trade membership data. The result of this was identifying 827 decision makers in these 243 firms that appeared to be appropriate to make entrepreneurial decisions. This also allowed us to augment the number of participants in our study. We sent personal emails with a link to an online survey to the entire population of appropriate individuals in these firms. The email also included an endorsement by the Swedish Magazine Association, thus providing added legitimacy to the study. We received responses from 343 people, corresponding to a response rate of 41%. This is very high for this type of study and certainly above international standards. Further, as part of our vetting process, we removed some people who in fact were not in a position to make such decisions and others returned incomplete responses. This reduced the effective sample to 246 people representing 130 magazine publishers.

The mean size of the firms was 25 full-time equivalent employees. 87% of the firms had 20 or fewer employees, which means the mean of 25 is skewed by the nine major publishing firms with more than 100 employees. 50% of the decision makers were categorized as top management (i.e. CEOs and executive level), 40% as editorial management (editor in chief or equivalent) and 10% as marketing/sales management (Managing Directors, Sales Director or equivalent). To out rule the possibility of non-response biases we compared responding and non-responding firms on the bases of size, turnover and profits. There were no statistically significant differences (p < 0.10). In the last reminder we asked the respondent to briefly provide information on the reason for not participating if choosing not to. The most common response was they did not see themselves fit to answer the questions, suggesting that they did not work with issues related to business development. This provides further validity to our vetting process and buffering our already strong response rate. Only a few replied they could not find time to reply.
Variables and Measures

Dependent variables: As mentioned previously, we follow the approach to measuring causation and effectuation that is set out in the Chandler et al. (2011) study. This includes treating effectuations as a formative index, where effectuation is separated into the sub-components of Flexibility, Affordable Loss, Experimentation and Pre-commitments. As such, we have a total of five dependent variables as (four for effectuation and one for causation) part of our analyses. Each of these sub-components was captured using multi-item survey items operationalized by Chandler et al. (2011). Each variable had strong Cronbach’s alphas (i.e. from 0.70 for the four items related to Flexibility to 0.86 for the six items related to Pre-commitments), thus showing high levels of internal reliability.

Independent variables: We examine independent and control variables at two different levels of analysis, the individual decision-makers and the organizational. This allows us to separate out the person from the organizational context in which she operates. Individual level: In line with the literature (e.g. Unger et al., 2011), we separate components of Human Capital into using multiple metrics. This also reflects the attempts in the effectuation literature to examine the expertise of the individual decision maker, which Dew et al. (2009) define as, “the deep personal ability and knowledge derived from extensive practice and experience base on immersion in the relevant domain”. As such, we capture the Industry Experience as a simple self-report number of years operating in the magazine industry. We also capture the Level of Education as the highest level of education earned. This data was coded into three categories to reflect main education types: secondary education, undergraduate education, and graduate education. We define Small Firm Experience as having worked for a firm with 50 employees or fewer (i.e. a dummy variable) and Startup Experience as having previously founded a firm (i.e. also a dummy variable). Finally, we defined Top Management as a self-report variable in terms of their position as either CEO or other executive level position.

Firm level: At the organizational level, we adopt Brown et al.’s (2001) measures of Entrepreneurial Culture. This variable included three items and had a Cronbach’s alpha of 0.64. Further, we build upon Fombrun (1996) and Schwaiger (2004) to capture Reputational Capital, defined as the perceptual representation of a firm’s past actions, here focusing on the reputation for innovativeness, expertise and employer attractiveness. This was made up on five items and had an internal reliability of 0.82. Finally, we also control for Firm Age and Firm Size (in terms of full-time employees). These were obtained via publicly available data.

Analyses and Results

We first examined the descriptive statistics and bivariate correlations of the key variables. These are available in Table 1 below. When examining the correlation matrix, we noticed that some of the correlations were relatively high, although all under 0.40. Some of these are expected, such as the statistically significant relationship between Small Firm experience and the control variable of Firm Size as well as the relatively strong relationships among the effectuation variables. These latter correlations are certainly in line with the findings of Chandler et al. (2011) that effectuation is a formative index. In addition, since we will be using hierarchical linear regression as our main analysis technique, it was prudent to further examine the data. Although these correlations are not critically high (Tabachnick & Fidell, 2000) it prompted us to examine the variance inflation factors...
(VIF’s). These fall well below the critical value of ten (cf. Hair, Anderson, Tatham, & Black, 1998), suggesting the multicollinearity is not a major issue in this study.

We test hypotheses 1-6 using hierarchical linear regression. These results are presented in Table 2 below. We first entered the individual level variables, consisting of the different measures of Human Capital. These are the main focus of hypotheses 1-4. These individual level variables explain a significant portion of the variance of the five different dependent variables. These variance explained levels ranged from 3.2% for Affordable Loss to 11.5% for Flexibility. In terms of the hypothesis, we find that industry experience has a marginal effect on the decision making styles; only Pre-commitments was statistically significant, and was in the opposite direction than hypothesized. This suggests that lower levels of industry experience are related to the use of Pre-commitments. As such, we reject H1a and H1b. Our hypothesis 2 was in regards to the level of education, and we argue that higher levels of education will be positively related to the use of causation (H2a) and negatively related to effectuation (H2b). The coefficient for causation is statistically significant (p < 0.05) and therefore our H2a is supported. Level of education is also significantly related to Flexibility and Pre-commitments, although both are negatively related. As such, we receive partial support for H2b. Our third set of hypotheses relates to the previous experience in small firms and with founding a startup. For these hypotheses, we find weak results, with only Pre-commitments being statistically related in the hypothesized direction to small or startup firm experience. However, small firm experience is statistically significant and negatively related (p < 0.05) to Causation, suggesting that those with high levels of experience in small firms will shy away from using a causal logic. Our final hypotheses at the individual level examine the position as Top Management and the use of decision making logics. We argue that this position will be positively related to both effectual and causal logics. Hypotheses 4a and 4b are supported as Top Management is statistically related to Causation (p < 0.05), Affordable Loss (p < 0.05), Flexibility (p < 0.001), and Experimentation (p < 0.001). It is however not related to Pre-commitments.

We will now turn our attention to the firm-level variables which represent Hypotheses 5 and 6. On the whole, we find stronger effects for the organizational variables than the individual variables. Variance explained levels varied from 5.4% for Affordable Loss to 18.1% for Causation. Each of the organizational variables was statistically significant, with the exception of Reputational Capital and Affordable Loss. There was however some fluctuation in the magnitude of the significance. Nevertheless, we find that Entrepreneurial Culture and Reputational Capital were significant predictors of the use of decision making logics, and therefore we provide support for H5 and H6. As before, results can be seen in Table 2.

**DISCUSSION**

In this paper, we hypothesized about the effects of the individual decision-makers’ human capital and organizational factors on the use of effectual and causal logics. Our empirical results, based on hierarchical linear regression, reveal an interesting and novel pattern that helps better inform our understanding of the role of human capital and organizational context as important antecedents of the use of effectual and causal logics in a corporate setting.

Firstly, we find that the human capital of the decision-maker is an important predictor of the use of effectuation or causation. Although in line with the literature, we provide an added level of detail concerning the type of human capital beyond simply ‘expertise’ (Sarasvathy, 2008).
Interestingly, the human capital antecedents vary between effectual and causal logics, including for the different components of effectuation. For example, an important human capital predictor of causation is level of education, where those with higher levels of education prefer causation. On the other hand, level of education does not predict the use of effectuation. The experience from having worked for a small firm is negatively related to causation, implying that decision makers in small firms may shy away from a rationally oriented decision making style. However, we did not find that small firm or startup experience was strongly related to effectual principles, with the exception of Pre-commitments. Together these findings imply that “entrepreneurial thinking” may not entirely be based on previous experience and expertise within a specific context, as Sarasvathy (2001) suggests. Top managers’ ambidexterity related to the preference for causal as well as effectual logic supports that the two logics are not each opposing extremes of the same continuum. It also reflects the multi-faceted realities of managers working in dynamic industries, whereas Kahneman and Tversky (1974) suggest the situation at hand is likely to determine what logic is most suitable and/or most preferred.

Secondly, we find that there were much stronger firm-level effects than individual-level effects. This provides some support for the notion that the organizational context will have greater impact on the overall decision making style than the individual decision-makers will. This falls in line with the notion of culture as determining a number of factors, of which decisions are one part. We find that both Entrepreneurial Culture and Reputational Capital were important predictors of all decision making styles, with the exception of Affordable Loss. These variables represent orientations towards the pursuit of opportunities as well as reputation for being innovative. As such, it seems as though the most innovation-experienced firms tend to employ effectuation principles. This furthers the line of thought that effectual logic stems from experience, and thereby helps bridge effectuation research at the individual-level with that at the firm-level. However, this finding also raises questions of temporality; naturally given the research design that we used, we note that the previous successes of the firm affect the decision making logic. However, it may also be that the quality of the decision making logics contributed to the success. As such, there may be some questions of causality that can be delved into more in future studies, especially those that employ more temporally lagged dependent variables.

Of potential interest is the fact that these antecedents also help predict the use of causation suggests that the most innovative firms use both modes. A possible explanation could be linked to the use of analytic vs. creative processes (Amabile, 1996) in different phases of a business development related project. Research conducted as part of this project (Johansson, Ellonen & Jantunen, Forthcoming), but was based on narrative interviews with decision makers in the magazine industry in Sweden, Holland and Finland, we find that there is a corporate need for causal processes (including marketing research, formal project plans, etc.) in the early stages of work. Often, this is required to pass the “go/no go” stage gate threshold and thereby receive approval and necessary funding in order to proceed. After this stage though, the creative phase begins and considerably looser decision making structures are used, including effectual principles. As advertisers are the main stakeholder (next to readers/users) for magazine publishers and are very demanding when it comes to having clear systematic facts, this frequently requires publishers to rely heavily on market research.

Interestingly, our two control variables (Firm Size and Firm Age) were important predictors of Affordable Loss, Flexibility, and Pre-commitments. Oddly, Firm Size was positively related to
Affordable Loss and negatively related to Pre-commitments while Firm Age was negatively related to Affordable Loss and Flexibility. Plausible explanations for this may be that large firms have responsibilities to shareholders or maintaining stricter budgets and therefore may limit the amount of money put at stake in business development projects to “see what happens”. However, younger firms that may be more resources strapped may rely on Affordable Loss for different reasons. Large firms may also see less benefit to external relationships at early stages as it is likely they have the resources they see necessary within the own firm without having to add additional sources of relational complexity. Additionally, large firms could be more protective about their ideas than smaller firms, fearing that competitors will beat them to the market which would explain the negative relationship to Pre-commitments that may take more time to complete. The fact that Firm Size is an important predictor also indicates that the current organizational environment matters for the choice of decision making logic. Further, the negative relationship between Firm Age and Flexibility could be explained by the increased degree of formalization and routinization which generally evolves as the firm grows older.

Finally, we find that there are different antecedents of the different components of Effectuation, both at the individual and firm-levels. This provide further support for treating Effectuation as a formative construct, in line with the findings of Chandler et al. (2011), implying that future studies should incorporate the different aspects rather than treating effectuation as a singular variable. While there is now growing evidence in the literature to support this argument, we argue that our findings constitute a further, albeit minor, contribution as we show that related but different variables (i.e. our Human Capital variables) work as differential predictors.

As with all research, our work has several limitations, each of which opens up avenues for further research. Firstly, our study does not uncover the use of effectuation and causation in different situations and circumstances, which would have made it possible to discuss why and when decision makers show preference for both the causal as well as the effectual logic. Our main focus is on the decisions relating to business development projects in general, although there is an uncertainty bias in this setting given the uncertainty of the industry. Secondly, we did not include prior experience from dealing with uncertain situations, but rather assumed that prior start-up experience would automatically encompass this element of expertise. Indeed, some of our variables such as Reputational Capital, may partially tap into this issue, but more explicit treatment of this firm-level expertise would be beneficial. In hindsight, it is of course not necessarily so that all business start-ups are surrounded by uncertainty. Future studies could hence look into the expertise related to uncertainty in particular. Thirdly, we adopt a cross-sectional approach to measuring core variables, and thus, as mentioned in the discussion section, it is sometimes difficult to try conclusions about the temporal and causal nature of the relationship among variables. Finally, we did not examine the role of the type of higher education acquired for the preferred decision making logic, including the specific topics studies. Previous research has suggested that different topics of study within education may have some impact on decision-making styles (Dew, et al., 2009; Gustavsson, 2006).

**Conclusion**

This paper contributes to the growing literature on entrepreneurial decision making in two ways. First, we provide a novel extension of the literature from a startup to a corporate context, and are thus able to better understand how organizational factors affect the choice of entrepre-
neurial decision making approaches. We show that the organizational context is better able to explain the choice of decision making logics than the individual experiences and human capital of the decision makers. Second, we parse out differing individual-level variables that relate to the Human Capital of the decision maker. We show that these individual factors vary depending on the type of specific decision making approach used. Together, these two major findings provide some important starting points for better understanding the choice of decision making logics that can be employed to best pursue opportunities under conditions of uncertainty. While this offers a number of potential new avenues for future research, it also provides some challenges as the nature of the relationship between individual level factors, organizational characteristics, and decision making styles seems much more complex than previously anticipated.

CONTACT: Anette Johansson; anette.johansson@jibs.hj.se; (T) +46 36 101 722; Jönköping International Business School, PO Box 1026, Jönköping 551 11, Sweden.

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REFERENCES


### Table 1. Descriptive statistics and bivariate correlations

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**Notes:** Two-tailed Pearson correlations presented. * p < 0.05; ** p < 0.01, *** p < 0.001

### Table 2. Effects of individual human capital and organizational factors on decision processes

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<th></th>
<th>Causation</th>
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<td>.154*</td>
<td>.317***</td>
<td>.219***</td>
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| **Organizational level** |           |                 |             |                 |                 |
| Firm size                | .067      | .228*           | -.018       | -.011           | -.185*          |
| Firm age                 | .116      | -.200*          | -.149+      | .040            | .048            |
| Entrepreneurial culture  | .145*     | .172**          | .215***     | .240***         | .161**          |
| Reputation               | .308***   | .024            | .281***     | .232***         | .241***         |

| R²                       | .236***   | .086*           | .276***     | .202***         | .158***         |
| Adj. R²                  | .205***   | .049*           | .246***     | .169***         | .123***         |
| Δ R²                     | .182***   | .054*           | .161***     | .144***         | .105***         |

**Notes:** Changes in R² reflect changes from Individual to Organizational level. Standardized coefficients presented. 
+ p < 0.10; * p < 0.05; ** p < 0.01, *** p < 0.001