

The Effects of Pre-venture Plan Timing and Perceived Environmental Uncertainty on the Persistence of Emerging Firms

Jianwen Liao
William B. Gartner

ABSTRACT. This paper explores the effects of when pre-venture planning occurs (early or late) in the sequence of activities accomplished during the process of new business emergence, and the moderating effects of environmental context (the degree of perceived financial, competitive and operational uncertainty), on the persistence of emerging business startup efforts. Using data from the U.S. Panel Study of Entrepreneurial Dynamics (PSED), our analyses found a strong main effect for business planning: Nascent entrepreneurs who completed a business plan were 2.6 times more likely to persist in the process of business emergence than those who did not complete a plan. In addition, the likelihood of venture persistence increased when nascent entrepreneurs engaged in planning early in the sequence of start-up activities in perceived uncertain financial and competitive environments, while venture persistence increased when nascent entrepreneurs engaged in planning late in a sequence of activities in perceived certain financial and competitive environments.

KEYWORDS: nascent entrepreneurs, Panel Study of Entrepreneurial Dynamics, pre-venture planning

1. Introduction

Entrepreneurial action is necessary to assemble the resources and capabilities required for new firms to come into existence (Gartner, 1985; Katz and Gartner, 1988; Shaver and Scott, 1991;

Reynolds and Miller, 1992; Carter et al., 1996; Alvarez and Busenitz, 2001; Delmar and Shane, 2003, 2004; Gartner and Carter, 2003; Honig and Karlsson, 2004). Yet, all entrepreneurs have limitations for undertaking a variety of organizing activities simultaneously (Aldrich, 1999; Bhidé, 2000). Since the formation of new organizations evolves through a sequence of venture activities over time, it would be reasonable to assume that some venture creation activities would be more beneficial to engage in before others (Gartner and Carter, 2003). There is a long history of thought in the entrepreneurship area that suggests that entrepreneurs should engage in business planning early in the process of venture formation as a way to guide these new venture creators towards activities that are more useful for starting new firms (e.g., Fry and Stoner, 1985; Mancuso, 1985; Henderson, 1988). Indeed, while there has been some concern about devoting too much time to business planning or making the business planning process too sophisticated (Bhidé, 1994; Gumpert, 2003), there is a strong belief that it is better to engage in some type of planning early in the venture development process, rather than later (Bhidé, 2000). Recent research on the role of pre-venture planning in venture creation appears to support this view. For example, studies by Delmar and Shane (2003, 2004), and Honig and Karlsson (2004) suggest that nascent entrepreneurs should engage in pre-venture planning early because they were likely to use pre-venture planning as a way to generate legitimacy and therefore enhance venture persistence (Meyer and Rowan, 1977). Delmar and Shane (2004) indicate “Our evidence suggests that completing business plans

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Jianwen Liao
Northeastern Illinois University
5500 N. St. Louis, Chicago, IL, 60625, USA

William B. Gartner
Spiro Center for Entrepreneurial Leadership
Clemson University
345 Surrine Hall, Clemson, SC, 29634-1305, USA
E-mail: gartner@clemson.edu

and establishing a legal entity early in the life of a new venture are advantageous to new ventures because these activities facilitate the transition to other firm organizing activities” (p. 406).

Yet, business planning early in the formation of new ventures may not be effective in all environmental contexts (Castrogiovanni, 1996). For example, Matthews and Scott (1995) found that as perceived environmental uncertainty increased, new entrepreneurial and small firms were less likely to engage in business planning. They suggested that entrepreneurs who perceive highly uncertain environments may be less likely to engage in planning because they believe that planning efforts will not provide any information that can be usefully acted on. From a social constructionist perspective, Baker and Nelson (2005) identified entrepreneurs who enacted the creation of necessary resources for venture development and growth rather than rely on perceived environmental constraints. They suggest that entrepreneurs construct their businesses and environments through action:

The bricoleurs in our study did not view opportunities as objective and external to the resources and activities of the firm. Rather, the processes of discovering opportunities and enacting resources were often one and the same, with both the resource environment and the opportunity environment idiosyncratic to the specific firm and constructed through processes of bricolage. (Baker and Nelson, 2005: 358)

They make a case for Weick’s view that action is necessary for sensemaking to occur (Weick, 1979) which would imply that planning before taking action to explore the environment (certain or uncertain) would be premature.

We explore how both the emerging venture’s context and the benefits of planning will affect when nascent entrepreneurs should engage in pre-venture planning to increase the chances that efforts to continue the process of venture creation will persistence. Different contexts are likely to require different times for when planning should occur. And, different perspectives on the planning process may offer alternative views of when planning might be initiated. For

example, in contrast to the views of Matthews and Scott (1995), an alternative explanation for the need for planning early in uncertain environments could posit that nascent entrepreneurs who start businesses that require outside investment or significant support from outside stakeholders (i.e., situations that are perceived as a highly uncertain financial environment) would likely engage in planning early as a way to acquire these resources. Nascent entrepreneurs who don’t need resources from others may therefore be less inclined to write a plan early in the startup process. Or, in uncertain competitive environments, nascent entrepreneurs may believe that early pre-venture planning may help them better understand which actions they might find of value as a guide to undertaking future activities. In more stable environments, nascent entrepreneurs may find that they need to better understand their prior efforts, so they engage in pre-venture planning later in the startup process as a way to learn about what they have done. In those situations, pre-venture planning takes on Weick’s (1979) dictum, “How do I know what I think until I see what I say?” And, still other nascent entrepreneurs may find the complexity of their startup operations to be such that early pre-venture planning may help them more efficiently undertake the necessary actions for venture persistence. The value of pre-venture planning for venture persistence, then, is likely to be dependent on a variety of factors which could be explained from alternative perspectives.

In the following sections of the paper, we suggest hypotheses about how certain contexts will influence the efficacy of when pre-venture planning occurs as a way to increase the probability that new venture creation efforts will continue. Similar to Castrogiovanni’s (1996) ideas on the effects of perceived uncertainty on pre-venture planning, we suggest that nascent entrepreneurs are likely to plan early when they perceive high degrees of financial, competitive and operational uncertainty, and plan late when they perceive low degrees of financial, competitive and operational uncertainty. These hypotheses are operationalized and tested using data from the U. S. Panel Study of Entrepreneurial Dynamics (Gartner et al., 2004). Based

on the results generated, we offer insights into the value of pre-venture planning to increase the persistence of emerging firms, in general, as well as insights into when nascent entrepreneurs should engage in pre-venture planning under certain perceived environmental conditions.

2. Theoretical framework and hypothesis development

A comprehensive review of the pre-venture planning literature (Castrogiovanni, 1996) indicates that a broader range of factors than those explored by Delmar and Shane (2003, 2004) may influence the organizing process, which may differentially affect the efficacy of pre-venture planning on venture persistence. Castrogiovanni suggested that many interrelated dimensions are likely to affect the value of pre-venture planning on venture persistence: the background and capabilities of the nascent entrepreneur; the nature and purpose of pre-venture planning for the nascent entrepreneur; the types of businesses that might be more likely to need pre-venture planning; the environmental context and kinds of industries that might lead nascent entrepreneurs to engage in planning; the value and outcomes of pre-venture planning to subsequent activities, and likelihood that new ventures would be created and grow. Castrogiovanni organizes these factors in a framework of two dimensions that would affect the degree to which pre-venture planning would occur and be of value to the emerging venture's persistence: planning context and planning benefits. Planning context comprises such factors as the environmental and founding conditions of the emerging venture. Environmental conditions would take into consideration the uncertainty and munificence of the emerging venture's context. Founding conditions would consider the founder's knowledge and the emerging venture's need for resources beyond the founder's personal funds.

2.1. *Environmental uncertainty*

Environmental uncertainty is a central construct in the inquiry of relationships between an

organization and its environment (Aldrich, 1999). Environmental uncertainty is generally referred to as the difference between the amount of information required to perform a task and the amount of information possessed by an individual or an organization (Galbraith, 1973). In a review of the literature and research on environmental uncertainty, Milliken (1987) developed a general definition of environmental uncertainty as "an individual's perceived inability to predict (an organization's environment) accurately because of a 'lack ... of information' or 'an inability to discriminate between relevant and irrelevant data'" (p. 136). Milliken further proposed three types of uncertainty – state, effect and response uncertainty. *State uncertainty* is referred to as perceived environmental uncertainty, which is defined as the inability to understand or to predict the state of the environment due to a lack of information or a lack of understanding of the interrelationships among environmental elements. *Effect uncertainty* is defined as an inability to predict what the consequences of environmental changes will be on the organization. *Response uncertainty* is referred to as an inability to predict the likely consequences of a response choice.

This research effort, as in other explorations of new venture planning and uncertainty (Delmar and Shane, 2003, 2004; Matthews and Human, 2000, 2004), focuses on state uncertainty. We look at state uncertainty as we believe these three types of uncertainty may differentially impact the timing of business planning. For example, if response uncertainty is high – knowing that actions (i.e., planning) will less likely lead to a desired effect, nascent entrepreneurs would more likely to delay planning to a later stage. However, if state uncertainty is high, nascent entrepreneurs may plan early by searching for additional information to reduce the perception of unpredictability. Using prior convention, we will refer to state uncertainty simply as "environmental uncertainty" throughout this paper.

Matthews and Human (2000, 2004) have explored three kinds of environmental uncertainty that are likely to affect the creation of new firms: financial, competitive and operational. Financial uncertainty describes the nascent

entrepreneur's perceptions of the likelihood of obtaining start-up and working capital, bank loans and investors. That is, when nascent entrepreneurs indicate high levels of financial uncertainty, they cannot predict with certainty that they will have the resources they need to start their ventures. Competitive uncertainty involves the nascent entrepreneur's perception of environmental factors that affect the strategic viability of the new firm: such as the likelihood the emerging firm will attract customers, successfully compete with other firms, keep up with technological advances in the industry, and comply with government regulations. Basically, these variables would constitute how a new firm would follow the "rules of the game" in a particular industry. Operational uncertainty involves the nascent entrepreneur's perception of the likelihood the emerging venture can be efficient in such activities as: obtaining raw materials, attracting employees, and obtaining supplies. If key aspects of the emerging business cannot be put into place in a cost effective manner, then, the emerging venture is likely to offer products or services at higher (less competitive) prices than its competitors. Perceptions of high operational uncertainty would indicate that nascent entrepreneurs felt less likely to be able to reduce the costs of actions to start an emerging firm, as well as reduce the costs of actions to coordinate the operation of a fledgling firm. These three types of environmental uncertainty (financial, competitive, and operational) are examined in our analyses.

2.2. *Uncertainty and business plan timing*

There are two opposing viewpoints regarding the effects of uncertainty on whether to plan early or late in the process of organization creation. On one side, some researchers find business planning should occur early under conditions of high environmental uncertainty. This perspective views the reduction of uncertainty through access to high quality information as one of the major objectives of business planning (Fuller, 1996). Labeled as "the information uncertainty perspective" (Swamidass and Newell, 1987: 514), these authors argue that

environmental uncertainty increases the need for information gathering and processing, therefore business planning. This line of reasoning is evident both in the prescriptive and empirical literature in the strategy area (i.e., Miller and Frisen, 1983; Ansoff, 1984). For example, Miller and Friesen (1983) conclude that strategic planning is a means to counter the resulting unpredictability arising from constant changes in external environments. Matthew and Scott (1995) found evidence that entrepreneurial ventures (ventures with a high goal and future orientation) are actually more likely continue to plan in the face of increasing uncertainty.

On the other side, some researchers argue business planning may be delayed, postponed and even nullified in the face of environmental uncertainty. Environmental changes make information needed in the strategic planning process quickly obsolete (Bourgeois and Eisenhardt, 1988), so that high environmental uncertainty will likely render planning efforts futile. In this perspective, with high environmental uncertainty, the focus should be on short-term quick responses rather than purposeful and deliberate planning activities. Bhide (1994) suggests that under conditions of environmental uncertainty, entrepreneurs focus on actions that are based largely on intuition. His research found that when entrepreneurs faced increasing environmental uncertainty, they tended to postpone business planning efforts in order to pursue other activities.

As mentioned earlier, Castrogiovanni (1996) provides a comprehensive overview of the literature on pre-venture planning that suggests two broad factors affecting the value of the degree of business planning on business persistence: planning context and planning benefits. The planning context involves environmental and founding conditions. In terms of environmental conditions, he argues that the degree of environmental uncertainty will positively influence the degree of pre-venture planning while the degree of environmental munificence will be negatively correlated with the degree of pre-venture planning. In terms of founding conditions, he argues that the founder's preexisting knowledge of the business will be negatively correlated with the degree of pre-venture

planning while the business' need for capital beyond the founder's investment will be positively correlated to the degree of pre-venture planning.

Based on the three types of environmental uncertainty encountered by nascent entrepreneurs (Matthews and Human, 2000, 2004) we propose some hypotheses about how these different types of uncertainty would affect whether entrepreneurs engage in business planning early or late in the process of venture creation. We suggest that nascent entrepreneurs who perceive a high degree of financial uncertainty are likely to engage in planning early to obtain the necessary resources to create the firm. Nascent entrepreneurs would create a plan as a way to legitimate the viability of the prospective new business with those stakeholders with the resources required to develop the venture (Delmar and Shane, 2003, 2004; Honig and Karlsson, 2004). In situations of financial uncertainty, a nascent entrepreneur is likely to believe that the acquisition of resources early in the startup process will enable other startup activities to occur. For example, a nascent venture may need resources to pay employees to engage in product development and marketing. Without resources early on in the startup process, these other start-up activities are unlikely to be undertaken. We would assume that by engaging in planning efforts early in the start-up process, nascent entrepreneurs would expect to reduce their financial uncertainty by attracting various resource providers to the fledgling new venture. We would also assume that nascent entrepreneurs who expressed high financial certainty (indicated they had a high likelihood of obtaining resources) would plan late (vis-à-vis other startup activities). Since they were certain they could obtain resources (or had resources already in place), they would not need to write a plan early to obtain resources they already had or knew they could get. We posit:

H1a: Planning early in situations of perceived high financial uncertainty is likely to increase the likelihood of new venture persistence.

H1b: Planning late in situations of perceived financial certainty is likely to increase the likelihood of new venture persistence.

We believe that nascent entrepreneurs who perceive a high degree of competitive uncertainty would be engaged in "sense making," that is, nascent entrepreneurs would focus on understanding how the game is played in the situation they find themselves in Weick (1995). Such variables as attracting customers, competing with other firms, technology changes and complying with government regulations are all issues where a nascent entrepreneur would need to understand how these issues are inter-related, and which variables would likely affect the emerging firm at a particular moment in time. As Castrogiovanni points out, nascent entrepreneurs engage in sense making, through the planning benefit of learning, as a way to understand their competitive situation. Early pre-venture planning, therefore, might help nascent entrepreneurs better understand what subsequent actions to take for directing their emerging firms. In certain competitive environments, nascent entrepreneurs assume they already know the rules of the game, so they would have less need to plan to figure out what to do, indeed, their goal would be to act first. We posit:

H2a: Planning early in situations of perceived high competitive uncertainty is likely to increase the likelihood of new venture persistence.

H2b: Planning late in situations of perceived competitive certainty is likely to increase the likelihood of new venture persistence.

Early pre-venture planning might assist nascent entrepreneurs who perceive highly uncertain operational environments identify how they can more effectively take actions to enable their emerging firms to operate more efficiently. In contrast, nascent entrepreneurs in perceived certain operational environments would likely plan late since they have an understanding of how their activities might lead to operational efficiencies. We posit:

H3a: Planning early in situations of perceived high operational uncertainty is likely to increase the likelihood of new venture persistence.

H3b: Planning late in situations of perceived operational certainty is likely to increase the likelihood of new venture persistence.

In general, in situations where nascent entrepreneurs perceive uncertainty (financial, competitive and operational), we suggest that they are more likely to engage in pre-venture planning early in the process of new firm start-up. Perceptions of certain environments are likely to prompt nascent entrepreneurs to plan late (after they accomplish other start-up activities). Since, by the definition we have used here – “certain environments” are situations where nascent entrepreneurs believe they have sufficient knowledge – it begs the question as to whether entrepreneurs perceiving certain environments would see any need to engage in planning at all (Indeed, it may be the case that the activity of planning has no influence on a nascent entrepreneur’s ability to develop a new venture, particularly in environments where nascent entrepreneurs are certain about the characteristics of their environments. In these situations, the act of planning would take time and effort away from other tasks that may be more necessary for creating a new business. We offer this final hypothesis to explore whether the absence of planning may increase the likelihood of persistence in the creation of new ventures:

H4: The absence of planning in situations of perceived environmental certainty (financial, competitive, and operational) is likely to increase the likelihood of new venture persistence.

3. Research methods

3.1. Sampling procedures

The data for this study were obtained from the Panel Study of Entrepreneurial Dynamics (PSED). The PSED is a longitudinal data set of individuals in the process of starting businesses who were identified from a random digit dialing telephone survey of 64,622 adults in the United States (Reynolds and Curtin, 2004). Details of the survey process and descriptions of specific items in the questionnaires used for the initial

and follow-up interviews can be found in the *Handbook of Entrepreneurial Dynamics* (Gartner et al., 2004).

To qualify as “nascent entrepreneurs,” that is, individuals who were in the process of starting a business, respondents answered “yes” to the following two questions: (1) Are you, alone or with others, now trying to start a new business? (2) Are you, alone or with others, now starting a new business or new venture for your employer? Is the effort a part of your job assignment? In addition, respondents needed to meet three additional criteria. First, they expected to have some share in the ownership of the business. Second, they were involved in activities to start the new firm in the last 12 months. Third, the effort was still in the start-up or gestation phase and was not an infant firm (Shaver et al., 2001). Based on these selection criteria, the number of cases available for analysis was 817.

A number of arguments have been offered that strongly urge researchers interested in the activities of nascent entrepreneurs to use cohorts of individuals initiating firms within the same time frame (Delmar and Shane, 2003, 2004; Gartner and Carter, 2003). Based on analyses of firm startup markers completed by each respondent at the initial interview: Gartner et al. (2003) suggested that a cohort of nascent entrepreneurs who first began startup activities within 2 years of the initial interview date would be appropriate as a similar time frame cohort when studying nascent entrepreneurs in the PSED dataset. We applied the 2-year time frame selection criteria, which resulted in a cohort of 361 nascent entrepreneurs.

Follow-up surveys were conducted at intervals of 12- (R wave), 24- (S wave), and 36- (T wave) months to evaluate the status of these start-up efforts. Because of a significant loss in number of respondents in the S wave and T wave follow-ups (see Reynolds and Curtin, 2004), we selected nascent entrepreneurs who had responded at the first follow-up (R wave). This provided us with a cohort of 276 nascent entrepreneurs who reported their status as: operating business – 83, active start-up – 71, inactive start-up – 59 and no longer worked on – 63. We labeled the first two categories as

“continuing startups” and the latter two as “discontinued startups.”

The PSED dataset comes with post-stratification weights for each respondent based on estimates from the U.S. Census Bureau’s Current Population Survey (Curtin and Reynolds, 2004). The post-stratification scheme was based on gender, age, ethnic background and educational attainment. Applying these weights for analyses are essential for the generalizability of any studies related to PSED data set. According to Curtin and Reynolds (2004: 492) “Weights should be used in all types of analyses.” As per their suggestions for using these weights, we adjusted the weights to reflect the reduction in the number of cases due to missing and not applicable responses.

3.2. Measures

3.2.1. Persistence

Following the suggestions of Delmar and Shane (2003, 2004) we considered organizing efforts that resulted in a new firm or were still ongoing, to be an indicator of emerging firm persistence. In the follow-up data collection (R wave), which occurred approximately 1 year after the initial interview, nascent entrepreneurs were asked about the status of their startup efforts. Responses fell into four categories – “operating business,” “active startup,” “inactive startup,” and “no longer worked on.” The first two categories were coded as “continuing startups” (1), while the last two categories were “discontinued startups” (0). In our final sample of those nascent entrepreneurs who reported information on startup status at the R wave: 56.9% were coded as “continuing startups” while 43.1% were coded as discontinued startups.

3.2.2. Business planning

In the initial interview (Q wave) and first follow-up (R wave) of data collection, nascent entrepreneurs were asked if they engaged in a list of 26 start-up activities (Gartner et al., 2004). The measure for the activity of business planning used for this study were items Q111 and R111: “A business plan usually outlines the markets to be served, the products or services to be provided, the resources required, including money, and the expected growth and profit for the new

business. Has a business plan been prepared for this start-up?” Nascent entrepreneurs who reported “yes” on this business planning activity measure were coded as “1,” while those who reported “no” were coded as “0.”

3.2.3. Business plan timing

Business planning may occur at any point along a sequence of start-up activities. When nascent entrepreneurs were interviewed about the 26 start-up activities, they were asked whether each specific activity had been completed (yes or no). If a nascent entrepreneur said “yes,” a month and year was also provided for when that activity occurred. Calculating whether business planning was early or late in the sequence of start-up activities was determined as the time (in months) from the date in which any one of the 26 start-up activities were initiated to the date when business planning occurred. This number was divided by the total gestation time, which is determined as the time (in months) between the dates of the earliest and latest activities indicated from responses in both the Q and R waves.

3.2.4. Perceived environmental uncertainty

To ascertain perceptions of environmental uncertainty, we used an 11-item measure from PSED mail survey (Matthews and Human, 2004). Each variable used a five-point Likert scale to assess respondents’ perceptions of the environmental context for entrepreneurship. These items are related to these nascent entrepreneurs’ perceptions of their ability to understand or to predict the state of various environmental conditions due to lack of information or uncertainty about that environment. The question for the 11-item scale reads: “Considering the economic and community context for the new firm, how certain are you that the new business will be able to accomplish each of the following?” The response scale was anchored by (5) – “very high certainty” to (1) – “very low certainty” including a category for (8) – “does not apply.” A principal components factor analysis with varimax rotation was conducted on the responses to the 11-item measure and three factors were extracted with eigenvalues greater than one. As suggested by Matthews and Human (2004), we labeled these

three factors as “Financial Uncertainty,” “Competitive Uncertainty,” and “Operational Uncertainty.” Cumulatively they account for approximately 53% of the variance. Cronbach’s alphas for the three factors were 0.758, 0.705 and 0.682. Our results were consistent with Matthew and Human’s (2004) factor analysis of responses from nascent entrepreneurs completing the mail questionnaire items at the initial interview stage (Q wave). The composite factor values from our factor analysis were used (see Table I).

3.2.5. Control variables

Prior research has argued that persistence of new ventures depends on the founder’s human capital (Bates, 1990; Bruderl et al., 1992; Castrogiovanni, 1996). Following Delmar and Shane (2004), we control for five dimensions of human capital: education, industry experience, managerial experience, prior startup experience and venture team size. For education, nascent entrepreneurs were asked “what is the highest level of education you have completed so far?” Responses were coded on an ordinal scale from 0 to 9, with 0 – “up to eighth grade” to 9 – “LLD, MD, Ph. D and EDD degree.” Studies suggest that entrepreneurs with more industry

experience are less likely to terminate their new ventures (Bates, 1990). We measure industry experience as the total years of full-time paid work experience in any field within the industry these nascent entrepreneurs were starting their emerging firms in. For managerial experience, nascent entrepreneurs were asked to respond to the question “For how many years, if any, did you have any managerial, supervisory or administrative responsibilities.” Consistent with Bruderl and Preisendorfer (1998), we control for prior startup experience and venture team size. Prior startup experience was measured by the number of startups a nascent entrepreneur has been involved with. We coded “0” for first time entrepreneurs and “1” for those who have had prior startup experience. Lechler (2001) in a review of research on ventures formed by teams versus solo-founders indicated that teams are more successful. Team size is measured as the number of members in the initial venture team at the time of the initial interview. Finally, we control for the industry and an entrepreneur’s growth aspiration. Growth aspiration was operationalized as expectations of whether nascent entrepreneurs wanted to grow their ventures to a size “as large as possible” or “at a manageable level.” Matthews and Human

TABLE I
Factor analysis of perceived environmental uncertainty

Item number	Items	Factors		
		Financial uncertainty	Competitive uncertainty	Operational uncertainty
QD1c	Obtain start-up capital:	0.862	0.049	0.027
QD1d	Obtain working capital:	0.831	0.242	–0.022
QD1f	Obtain a banks help	0.718	0.033	0.194
QD1k	Obtain venture capitalists’ help	0.499	0.058	0.458
QD1f	Attract customers	0.094	0.702	0.036
QD1g	Compete with other firms:	0.113	0.679	0.073
QD1h	Comply with local, state, and federal regulations	–0.041	0.700	0.058
QD1i	Keep up with technological advances	0.221	0.574	0.221
QD1a	Obtain raw materials	0.004	–0.067	0.779
QD1b	Attract employees	0.267	0.213	0.535
QD1e	Deal with distributors	–0.002	0.368	0.554
	Eigenvalue (> 1)	2.343	2.024	1.508
	Percentage of variance	21.303	18.398	13.707
	Cumulative percentage	21.303	39.701	53.408
	Cronbach’s alpha	0.758	0.705	0.682

(2000) found that perceptions of operational uncertainty were highly correlated to growth aspirations. We control for industry by using SIC code information reported in the dataset, which we coded into 10 broad industry sectors: 1 for agriculture, forest and fishing, 2 for mining, 3 for construction, 4 for manufacturing, 5 for transportation and communication, 6 for wholesale, 7 for retail, 8 for business services, 9 for consumer and service, and 10 for health care and education.

3.3. Models

A series of logistic regression models were employed to determine the impact of business planning, the timing of business planning and the moderating effects of the various dimensions of environmental uncertainty on the probability of venture persistence. Binary logistic regression was used because it restricts the range of the dependent variable to a value between 0 and 1, which is appropriate for investigating the likelihood or probability of persistence. We first created a base model of logistic regression, which includes all our control variables and environmental uncertainty variables. We subsequently added business planning, timing of business planning and the cross products of timing of business planning and the three dimensions of environmental uncertainty independently. We then tested for the significance of the difference between the full models and the nested base model by using Chi-square tests. A significant Chi-square test means additional variance of probability of persistence explained by the added-on predictors.

4. Results

Table II lists means, standard deviation and correlations for our control variables, moderators and independent variables.

As indicated in model 1 of Table III, education, industry experience and team size have significant and positive coefficients, suggesting that nascent entrepreneurs with more years of education, industry experience and who started with a team will have a higher probability of

persistence in the startup process. Surprisingly, we failed to detect any significant impact of prior startup experience on venture persistence as predicted in previous studies (i.e., Bruderl et al., 1992). Furthermore, we also found that venture persistence is independent of industry sector.

Model 2 of Table III shows that the coefficient for business planning is 0.961 ($p < 0.01$) with an odd ratio of 2.614. It suggests that nascent entrepreneurs who completed a business plan were 2.614 times more likely to persist than those who did not. It should be noted that we also tested the interaction effects between business planning and the three dimensions of environmental uncertainty: financial, competitive and operational. All of these interaction effects were not statistically significant, suggesting a strong and independent effect of business planning on startup persistence. In a cross tabulation of business planning with persistence rate, nascent entrepreneurs who completed a business plan had a persistence rate of 66.7%, while those without a business plan had a persistence rate is 41.7%. Hypothesis 4 was, therefore, not confirmed. Planning is critical to continuing the process of venture emergence, no matter what the perception of the environment is, and whether planning occurs early or late in the venture creation process.

Model 3 tests the independent effect of the timing of business planning, overall, on venture persistence. The Chi-square change is not statistically significant ($\Delta\chi^2 = 0.885$; $df = 1$). Models 4, 5 and 6 test the cross products between timing of business planning and financial uncertainty, competitive uncertainty and operational uncertainty. Models 4 and 5 show that the impact of business planning on persistence is moderated by perceived financial uncertainty ($\Delta\chi^2 = 6.813$; $df = 1$; $p < 0.01$) and perceived competitive uncertainty ($\Delta\chi^2 = 11.381$; $df = 1$; $p < 0.01$). But we failed to detect any moderating effect for perceived operational uncertainty ($\Delta\chi^2 = 0.119$; $df = 1$).

We conducted additional analyses to interpret the interaction effect between the timing of business planning and financial and competitive uncertainty. First, variable means in Models 4 and 5 were substituted for all predictors except for the timing of business planning, the uncertainty

TABLE II
Descriptive statistics: means, standard deviation and correlation matrix

	N	Mean	STD	1	2	3	4	5	6	7	8	9	10	11	12	13
Continued vs. discontinued	276	0.558	0.498	1.000												
Education	274	4.693	2.008	0.164***	1.000											
Startup experience	276	0.188	0.392	0.037	0.059	1.000										
Industry experience	273	16.300	10.578	0.078	0.184***	0.066	1.000									
Managerial experience	266	7.925	8.168	0.054	0.198***	0.144**	0.615***	1.000								
Team size	273	1.908	1.069	0.144**	0.222***	-0.408***	0.064	0.091	1.000							
Industry Growth	271	7.336	2.000	-0.020	0.160***	0.020	-0.065	-0.070	-0.048	1.000						
aspiration	273	1.791	0.407	-0.001	0.042	-0.008	0.082	0.102*	-0.111*	0.171***	1.000					
Financial uncertainty	203	2.165	1.257	0.084	-0.041	-0.078	-0.066	-0.049	0.250***	-0.017	-0.013	1.000				
Competitive uncertainty	205	3.767	0.991	0.065	-0.008	0.088	-0.001	-0.052	0.062	0.001	-0.206	0.295***	1.000			
Operational uncertainty	203	2.159	1.383	-0.071	-0.129**	-0.120	-0.045	-0.063	0.155**	-0.160**	-0.158**	0.316***	0.347***	1.000		
W/without planning	276	0.620	0.486	0.250***	0.149**	-0.100*	0.107*	0.094	0.258***	-0.089	-0.110*	0.049	0.118*	0.051	1.000	
business planning	172	0.498	0.334	-0.108	-0.070	-0.081	0.059	-0.084	0.101	0.004	-0.062	0.125	0.003	0.069	0.114	1.000

* $p \leq 0.1$; ** $p \leq 0.05$; *** $p \leq 0.01$.

TABLE III
Main and interaction effects of timing of business, process and environment variables on persistence

Variable	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	β	Exp(β)	β	Exp(β)	β	Exp(β)	β	Exp(β)	β	Exp(β)	β	Exp(β)
Intercept	-2.049**	0.129	-2.115	0.121	-0.106	0.900	-1.974	0.139	-5.892**	0.030	-0.290	0.748
Education	0.171*	1.186	0.134	1.143	1.143	1.092	0.164	1.178	0.068	1.071	0.087	1.091
Startup experience	0.395	1.484	0.425	1.529	1.529	1.987	0.616	1.851	0.763	2.145	0.673	1.960
Industry experience	0.0389*	1.040	0.033	1.033	1.033	1.031	0.028	1.028	0.031	1.032	0.029	1.030
Managerial experience	-0.038	0.963	-0.038	0.963	0.963**	0.929	-0.0733**	0.929	-0.075*	0.928	-0.0724*	0.930
Team size	0.343*	1.409	0.262	1.299	1.299	1.444	0.349	1.417	0.427	1.533	0.364	1.438
Industry	0.171	1.187	0.168	1.183	1.183	1.218	0.297	1.346	0.073	1.076	0.220	1.246
Growth aspiration	-0.056	0.946	-0.036	0.965	0.965	1.027	0.029	1.029	0.100	1.105	0.024	1.024
Financial uncertainty	0.145	1.156	0.156	1.168	1.168	1.135	0.811**	2.249	0.146	1.157	0.120	1.127
Competitive uncertainty	0.197	1.218	0.127	1.136	1.136	0.846	-0.129	0.879	1.224**	3.399	-0.164	0.848
Operational uncertainty	-0.188	0.829	-0.180	0.835	0.835	0.961	-0.083	0.920	-0.033	0.967	0.048	1.049
W/without Biz planning			0.961***	2.614								
Timing of Biz planning					2.614	0.534	2.420**	11.242	12.041***	169610.95	-0.217	0.805
Timing of Biz planning × financial uncertainty							-1.380***	0.252				
Timing of Biz planning × competitive uncertainty									-3.175***	0.042		
Timing of Biz plan × operational uncertainty											-0.175	0.840
$\Delta\chi^2$	17.434		8.222		0.885		6.813		11.321		0.119	
d.f	10		1		1		1		1		1	
$\alpha \leq$	0.05		0.01		n.s.		0.01		0.01		n.s.	

* $p \leq 0.1$; ** $p \leq 0.05$; *** $p \leq 0.01$.

variable and the cross products between the two variables. The result was a reduced equation with the two predictors and their cross product. Second, we followed the procedure of Cohen and Levinthal (1990), in that we selected values for high and low of the uncertainty variable as one standard deviation above zero point and one standard deviation below zero point respectively. Substituting each of these values into the reduced equation yielded the following two sets of linear equations (Depicted in Figures 1a, b).

Model 4. Timing of Business Planning $\times$ Financial Uncertainty
When Financial Uncertainty is high (means + 1 std)

$$\ln[p/(1-p)] = 2.653 - 3.214 * \text{Timing of business planning}$$

When Financial Uncertainty is low (means - 1 std)

$$\ln[p/(1-p)] = 0.102 + 1.313 * \text{Timing of business planning}$$

Model 5. Timing of Business Planning $\times$ Competitive Uncertainty

When Competitive Uncertainty is high (means + 1 std)

$$\ln[p/(1-p)] = 2.389 - 3.417 * \text{Timing of business planning}$$

When Competitive Uncertainty is low (means - 1 std)

$$\ln[p/(1-p)] = -0.271 + 2.339 * \text{Timing of business planning}$$

where p is the probability of persistence.

Figure 1a indicates that the impact of timing of business planning on persistence depends on the degree of financial uncertainty. Specifically, planning early would increase venture persistence under highly uncertain financial environments. By contrast, planning late would increase venture persistence under more certain financial environments. This confirms hypotheses 1a and 1b.

Figure 1b indicates that perceived competitive uncertainty moderates the relationship between timing of business planning and the probability of persistence. Specifically, planning early significantly increased the surviving probability under uncertain competitive environments. By contrast, planning late would be more effective when the competitive environment is relatively certain. This confirms hypotheses 2a and 2b.

As mentioned earlier, we found no relationship between operational uncertainty and the timing of business planning, therefore, hypotheses 3a and 3b were not confirmed. We also tested the interaction effects between business planning (with or without) and the three types of environmental uncertainty. In all three logistic regression models, the added interaction terms were not statistically significant, therefore lending no support for Hypothesis 4. It therefore suggests that the effect of business planning is independent of environmental conditions.

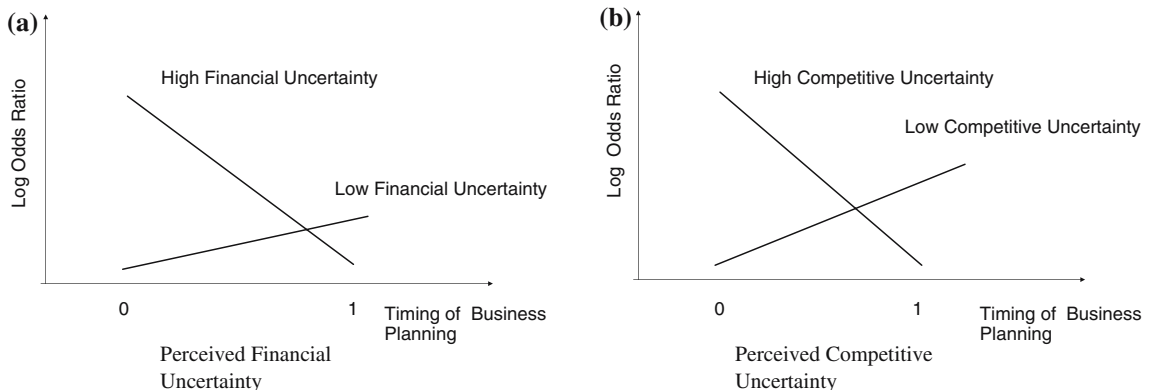


Figure 1. (a, b) Moderating effects of financial and competitive uncertainty.

Because the measure of persistence separates nascent entrepreneurs into two groups consisting of discontinued startups (inactive and those who gave up) versus continuing startups (those still active in trying to start a business and those who started businesses), there may be characteristics in the continuing startup group (between the “still active” group and those who started businesses group) which might affect these results. Carter et al. (1996) suggested that the “still active” group may consist of a number of nascent entrepreneurs who simply do not engage in enough activities to determine whether their entrepreneurial efforts could be a success or a failure. One might think of some of these “still active” nascent entrepreneurs as “dabblers” compared to those nascent entrepreneurs who were able to get a new business in operation. We tested the logistic regression models for a recoded sample of the “in-business” group, coded as “1” and the “still active” group, coded as “0”. To our surprise, we failed to detect any significant impact on business planning, and its interactions with uncertainty variables on the rate difference between “still active” and “in-business.”

Finally, while the measure used for business planning (Q111 and R111) in this study describes what a business plan contains, and then asks whether such a plan has been prepared, there is likely to be varying degrees to which these plans are actually formalized. Matthews et al. (2003) argue that all entrepreneurs

engage in planning, to some degree, throughout the venture creation process as an ongoing inherent cognitive orientation of individuals involved in undertaking new activities. From their perspective, the completion of a business plan may be achieved in varying degrees of formalization, from something that is in the entrepreneurs’ head to a formally prepared plan. This logic was explored in the PSED research program. For those nascent entrepreneurs who answered “yes” to Q111 or R111, respondents were then asked in Q114: “What is the current form – (1) unwritten or in your head, (2) informally written, (3) formally prepared, (4) both 1 and 2, (5) Don’t know, or (6) Something else?” In Table IV we report a cross tabulation of the three types of business plan formalization (unwritten, informal, and formally prepared) by whether these plans were accomplished early or late in the venture creation process. Surprisingly, only about a third of those who responded to this question indicated that they completed a formally prepared business plan. So, while nascent entrepreneurs may indicate that they complete a business plan (i.e., Q111: “A business plan usually outlines the markets to be served, the products or services to be provided, the resources required, including money, and the expected growth and profit for the new business. Has a business plan been prepared for this startup?”), it is less likely to be in the formalized format many scholars and consultants would

TABLE IV
Business plan timing (early or late) by plan formalization

Respondent count	Business plan formalization			Total
	Unwritten/in head	Informally written	Formally prepared	
<i>Business plan timing</i>				
Early	15	42	21	78
Late	11	30	34	75
Total	26	72	55	153
χ^2 test	0.615	3.769*	4.786**	

* $p < 0.1$, ** $p < 0.01$.

Note: Three respondents in the planned early category reported “something else”.

One respondent in the planned early category reported “don’t know”.

One respondent in the planned early category reported both “unwritten and informally written”.

One respondent in the planned late category reported both “unwritten and informally written”.

suggest (Gumpert, 2003). In addition, these results indicate that there is a weak statistical relationship ($p < 0.1$) suggesting that when nascent entrepreneurs plan early they are more likely to complete informal plans, and a strong statistical relationship ($p < 0.01$) suggesting that when nascent entrepreneurs plan late they are more likely to complete formally prepared plans. We found these results somewhat counter-intuitive, and we will discuss them in the next section.

5. Discussion and conclusions

This study looked at nascent entrepreneurs in the process of starting companies to determine whether the completion of a business plan improved the likelihood of venture creation persistence. In addition, we studied whether these nascent entrepreneurs' perceived environments had any moderating effect on whether planning efforts occurring either early or late in the venture development process also improved the likelihood of venture creation persistence. The results of this study indicate a significant main effect for the completion of a business plan for increasing the likelihood of persistence (i.e., establishing a new firm or continuing to engage in startup activities) irregardless of the emerging venture's context. Pre-venture planning does matter. It is better, in general, to complete a business plan during the process of venture creation, than to not plan. This result is in line with recent research (Delmar and Shane, 2003, 2004; Honig and Karlsson, 2004) that found that business planning increases persistence in the venture creation process as well as increasing the likelihood of success at starting new ventures.

We should also note that a nascent entrepreneur's level of education and industry experience had an affect on persistence, while other control variables, such growth aspirations and team size did not. The finding that industry experience increases the likelihood of persistence is also consistent with previous research (Parker, 2004).

The emerging venture's context does seem to moderate the effect on venture persistence for when pre-venture planning occurs in the process

of venture creation. Nascent entrepreneurs completing business plans early in the startup process in highly uncertain financial and competitive environments were more likely to persist in the venture creation process than those who planned late. And, nascent entrepreneurs completing business plans late in the startup process in certain financial and competitive environments were more likely to persist in the venture creation process than those who planned early. Operational uncertainty does not appear to affect the impact of business planning on the persistence of emerging firms.

These results would seem to support prior theory and evidence (Castrogiovanni, 1996; Delmar and Shane, 2004) and some practitioner wisdom that early business planning can be beneficial. What this research shows, though, is that not all emerging ventures will benefit from planning early.

Before offering any additional thoughts about issues of planning early or late in different environmental contexts, it is important to look closely at what each of the three uncertainty measures, actually measures (see Table I). In this study, "financial uncertainty" ascertains these nascent entrepreneurs' perceptions of their ability to accomplish the acquisition of financial resources for the emerging venture. A "less certain" financial environment means that the nascent entrepreneur is less certain of obtaining startup capital, working capital, help from a bank, or assistance from a venture capitalist. "Competitive uncertainty" ascertains these nascent entrepreneurs' perceptions of their ability to attract customers, compete with other firms, comply with government regulations and keep up with technological advances. And "operational uncertainty" focuses on perceptions of whether nascent entrepreneurs can accomplish such tasks as obtaining raw materials, attracting employees, and deal with distributors. Ratings of "very low certainty" indicate environments where nascent entrepreneurs are less confident they have the information from their economic and community context to determine whether their firms can accomplish financial, competitive, and operational activities.

Given these descriptions of the three types of environments, we believe that our findings show

that early business planning is more helpful in situations where nascent entrepreneurs need to acquire financial resources that may enable subsequent organizing activities to occur (thereby leading to venture persistence), and where nascent entrepreneurs need to make sense of more uncertain competitive environments (thereby leading to venture persistence). We would have thought that one of the reasons for completing a business plan early in the venture creation process in conditions of financial uncertainty, would be for the purposes of raising financial resources from others, and, that such planning would likely involve the completion of a formally prepared business plan. The results in Table IV temper this assumption. For those respondents indicating the degree of business plan formalization, nearly 75% of those nascent entrepreneurs who planned early (78 respondents), completed a plan that was “unwritten” (15 respondents) or “informal” (42 respondents). If formally prepared business plans are necessary for acquiring financial resources, most nascent entrepreneurs who planned early were not taking this route. How these “unwritten and informal” business plans were used, then, is an issue that needs further exploration.

We believe that the completion of a business plan early in the venture formation process seems to help nascent entrepreneurs reduce “state” uncertainty (Milliken, 1987). In completing “unwritten and informal” business plans, as well as formally prepared plans, nascent entrepreneurs gain information to help them better understand their situations through the process of planning. We would surmise that planning early to reduce uncertainty enables nascent entrepreneurs to more effectively identify what other actions to accomplish.

In some respects, we can use the finding that success at venture persistence for nascent entrepreneurs who perceive more certain financial and competitive environments, and who plan later, as evidence that in situations where there is less need to reduce state uncertainty, the process of completing a business plan is less necessary at the beginning of the startup process.

The finding that operational uncertainty had no effect on planning, and no effect on planning

early or late, as it pertains to persistence, is subject to some speculation. Given that the variables that consist of this measure are composed of activities that often have alternative sources of supply (i.e., raw materials, employees, distributors), the knowledge that choices exist for acquiring these resources might be more important than the value of gaining knowledge of what specific choices might be available. That is, the state uncertainty for operational aspects of the new venture may be perceived as something that the entrepreneur has more control over, where being either certain or uncertain of operational issues may have less impact. Both financial and competitive uncertainty may seem to be areas where reducing certainty is perceived to have more impact on the emerging firm’s survival.

5.1. *Limitations and suggestions for future research*

As is in the use of any secondary dataset, one of the problems with using the PSED is that one can only use the questions that were asked. The business planning questions in the PSED are, at best, crude measures of business planning and the business planning process. It would be helpful to know more about the specific kinds of activities (e.g., preparing pro-forma income statements and capital budgets, identifying specific customers) that nascent entrepreneurs undertook during the process of business planning, and the amount of time and effort devoted to these activities. The evidence in Table IV is disconcerting in that a large number of nascent entrepreneurs completed business plans that were “in their head/unwritten” or “informally written.” An exploration of what constitutes a completed “unwritten” business plan would be a helpful insight. It would also be helpful to know more about the reasons nascent entrepreneurs engaged in business planning. Few questions are asked in the PSED that attempt to explore why nascent entrepreneurs engage in the activities they do. Providing reasons for planning activities would generate many insights as to whether business plans were used to raise capital, etc. It would be valuable to supplement the PSED cases with matching in-depth case studies of nascent entrepreneurs (i.e., finding nascent

entrepreneurs who have similar demographic, start-up and venture characteristics) to identify more of the details and logic used by these individuals for how and why they planned.

Some concerns have been raised about the endogenous aspects of perceived uncertainty and planning, in that, the process of planning, itself, would seem to increase a nascent entrepreneurs' awareness of uncertainty in the environment. Or, the lack of planning may suggest an "ignorance is bliss" effect, where perceptions of a certain environment reflects a lack of due diligence on the part of some nascent entrepreneurs. Our efforts to untangle the influence of planning activities on perceptions of uncertainty through analyses of when the perception measures were asked in the sequence of other venture creation activities, was inconclusive. Further analyses on the timing of planning activities and the administration of perceptual questions about the environment need to be undertaken to determine their interactive effects.

Business planning is only one of many activities that nascent entrepreneurs may undertake during the startup process. As shown in Delmar and Shane (2003: 1177), business planning appears to be significantly correlated to organizing activities, overall. This might suggest that those nascent entrepreneurs engaged in business planning may also be simultaneously engaged in completing other kinds of startup behaviors that may also affect persistence. This study explored whether business planning occurred early or late as measured by a ratio of: the months between when the first startup activity occurred and when business planning occurred, and the months between when the first startup activity and last startup activity occurred. We did not explore the number of startup activities that may have occurred, when each startup activity occurred, or the sequence of each startup activity, and how the number, timing, and sequence of other startup activities may affect the value of business planning for venture persistence.

And, finally, the process of business planning, itself, is likely to involve undertaking a number of activities that may be beneficial for persistence. The process of planning is more than the process of generating the plan, itself. If the business plan "outlines the markets to be served,

the products and services to be provided, and the resources required..." then nascent entrepreneurs would have needed to engage in a variety of behaviors to generate this information. Parsing out what entrepreneurs do when they plan is likely to provide insights into how "doing" informs "thinking" when planning.

A number of other features of an emerging venture's context may also affect the value and timing of business planning. A nascent entrepreneur's perception of uncertainty may be affected by the knowledge resources available. Nascent entrepreneurs vary in their level of social and business contacts (Aldrich and Carter, 2004), as well as their knowledge of government help (Dennis and Reynolds, 2004) that could help in reducing uncertainty. Nascent entrepreneurs who perceive more certain environments may also have more social, business and government support.

6. Conclusions

In general, pre-venture business planning significantly increases the likelihood that emerging firm formation efforts will continue and/or become new firms. Under certain perceived environments, pre-venture planning increases the likelihood of emerging firm persistence in situations where nascent entrepreneurs perceive higher levels of financial and competitive uncertainty. We suggest that the uncertainty measures used in this study may reflect these nascent entrepreneurs' confidence in their ability to both acquire resources (financial uncertainty) and compete against other firms (competitive uncertainty). When nascent entrepreneurs indicate they are less uncertain about their financial and competitive situations, they may be indicating that they lack confidence in the knowledge they currently have. Engaging in pre-venture planning would likely increase a nascent entrepreneur's knowledge, and thereby reduce uncertainty. In contrast, for those nascent entrepreneurs who were confident about their knowledge of their competitive and financial situation, engaging in pre-venture business planning would not be perceived as a way to enhance knowledge they already have. Planning for these entrepreneurs would be less relevant to

their business formation activities early on their venture creation efforts. Yet, as the emerging venture develops, nascent entrepreneur do plan (i.e., late planning) which increases the chances the emerging venture will persist.

Planning is important to the process of venture creation, and research should be undertaken to explore more of the details of the planning process as well as the specific activities these individuals engage in. Since the information gained from planning is likely to be gained from other activities (i.e., contacting customers, evaluating competitors, talking with investors), it is critical that we develop better ways to systematically observe entrepreneurial behavior over time. The PSED is the first step in developing generalizable data on the process of new business creation.

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